



Internal Use Only

<http://biz.lgservice.com>

Air Conditioner

SVC MANUAL(General)

CAUTION

Before Servicing the unit, read the safety precautions in General SVC manual.
Only for authorized service personnel.

TABLE OF CONTENTS

Part 1	General Information	3
	1. Safety Precautions	4
	2. Model Line Up	7
	3. Nomenclature	11
Part 2	Functions & Controls	15
	1. List of Functions & Accessory	16
	2. Air Flow	27
	3. Air Purifying	29
	4. Installation Functions	30
	5. Reliability	41
	6. Convenience Functions & Controls	42
	7. Special Function & KIT	50
Part 3	Basic Control	53
	1. Normal operation	54
	2 Compressor control	54
	3. EEV(Electronic Expansion Valve) control	54
Part 4	Trouble Shooting Guide	55
	1. Self-diagnosis Function	56
	2. Pump Down	58
	3. Evacuation (All amount of refrigerant leaked)	59
	4. Gas Charging (After Evacuation)	60
	5. Cycle Part	61
	6. Electronic Parts	62



Part 1 General Information

1. Safety Precautions	4
2. Model Line Up	7
3. Nomenclature	11




1. Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.








- Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

 WARNING	This symbol indicates the possibility of death or serious injury.
 CAUTION	This symbol indicates the possibility of injury or damage to properties only.






- Meanings of symbols used in this manual are as shown below.








	Be sure not to do.
	Be sure to follow the instruction.
	Dangerous Voltage

1.1 Cautions in Repair





 WARNING	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it.	
Do not touch the discharging refrigerant gas during the repair work. The discharging refrigerant gas. The refrigerant gas can cause frostbite.	
Release the refrigerant gas completely at a well-ventilated place first. Otherwise, when the pipe is disconnected, refrigerant gas or refrigerating machine oil discharges and it Can cause injury.	
When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.	
When removing the front panel or cabinet, execute short-circuit and discharge between high voltage capacitor terminals. If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury.	
Do not turn the air-conditioner ON or OFF by plugging or unplugging the power plug. There is risk of fire or electrical shock.	






Part 1 General Information

<p>Do not use a defective or underrated circuit breaker. Use the correctly rated breaker and fuse. Otherwise there is a risk of fire or electric shock.</p>	
<p>Install the panel and the cover of control box securely. Otherwise there is risk of fire or electric shock due to dust, water etc.</p>	
<p>Indoor/outdoor wiring connections must be secured tightly and the cable should be routed properly so that there is no force pulling the cable from the connection terminals. Improper or loose connections can cause heat generation or fire.</p>	
<p>Do not touch, operate, or repair the product with wet hands. Holding the plug by hand when taking out. Otherwise there is risk of electric shock or fire.</p>	
<p>Use a vacuum pump or Inert (nitrogen) gas when doing leakage test or air purge. Do not compress air or Oxygen and Do not use Flammable gases. Otherwise, it may cause fire or explosion. - There is the risk of death, injury, fire or explosion.</p>	

 CAUTION	
<p>Do not turn on the breaker under condition that front panel and cabinet are removed.</p>	
<p>Be sure to earth the air conditioner with an earthing conductor connected to the earthing terminal.</p>	
<p>Conduct repair works after checking that the refrigerating cycle section has cooled down sufficiently. Otherwise, working on the unit, the hot refrigerating cycle section can cause burns.</p>	
<p>Do not tilt the unit when removing panels. Otherwise, the water inside the unit can spill and wet floor.</p>	
<p>Do not use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.</p>	
<p>Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.</p>	

1.2 Inspections after Repair

⚠ WARNING	
Check to see if the power cable plug is not dirty or loose. If the plug is dust or loose it can cause an electrical shock or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances. otherwise, it can cause an electrical shock, excessive heat generation or fire.	
Do not insert hands or other objects through the air inlet or outlet while the product is operating. There are sharp and moving parts that could cause personal injury.	
Do not block the inlet or outlet of air flow. It may cause product failure	

⚠ CAUTION	
Check to see if the parts are mounted correctly and wires are connected. Improper installation and connections can cause an electric shock or an injury.	
Check the installation platform or frame has corroded. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Be sure to check the earth wire is correctly connected.	
After the work has finished, be sure to do an insulation test to check the resistance is 2[Mohm] or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.	
Check the drainage of the indoor unit after the repair. If drainage is faulty the water to enter the room and wet floor.	



2. Model Line Up



2.1 Indoor units

Category		Chassis Name	Capacity Index [kW (kBTu/h)]								
			2.5 (9)	3.5 (12)	5.0 (18)	7.1 (24)	8.0 (30)	10.0 (36)	12.5 (42)	14.0 (48)	15.0 (60)
Ceiling Cassette	4-Way	TR	ATNH09GRLE2 [CT09 NR2]	ATNH12GRLE2 [CT12 NR2]							
		TQ			ATNH18GQLE2 [CT18 NQ2]						
		TP				ATNH24GPLE2 [CT24 NP2]	ATNH30GPLE2 [UT30 NP2]				
		TN						ATNH36GNLE2 [UT36 NN2]			
		TM							ATNH42GMLE2 [UT42 NM2]	ATNH48GMLE2 [UT48 NM2]	ATNH60GMLE2 [UT60 NM2]
Ceiling Concealed Duct	High Static Pressure	BH			ABNH18GH2A2 [CB18 NH2]	ABNH24GH2A2 [CB24 NH2]					
		BG					ABNH30GG2A2 [UB30 NG2]	ABNH36GG2A2 [UB36 NG2]			
		BR							ABNH42GR2A2 [UB42 NR2]	ABNH48GR2A2 [UB48 NR2]	ABNH60GR2A2 [UB60 NR2]
	High Static Pressure	M1			ABNW18GM1A0 [CM18 N14]	ABNW24GM1A0 [CM24 N14]	ABNW30GM1A0 [UM30 N14]				
		M2						ABNW36GM2A0 [UM36 N24]	ABNW42GM2A0 [UM42 N24]		
		M3								ABNW48GM3A0 [UM48 N34]	ABNW60GM3A0 [UM60 N34]
	Low Static Pressure	L1	ABNH09GL1A2 [CB09L N12]								
		L2		ABNH12GL2A2 [CB12L N22]	ABNH18GL2A2 [CB18L N22]						
		L3				ABNH24GL3A2 [CB24L N32]					
Ceiling & Floor	VE	AVNH09GELA2 [CV09 NE2]	AVNH12GELA2 [CV12 NE2]								
Ceiling Suspended	VJ			UVNH18GJLA2 [CV18 NJ2]	UVNH24GJLA2 [CV24 NJ2]	UVNH30GJLA2 [UV30 NJ2]					
	VK						UVNH36GKLA2 [UV36 NK2]				
	VL							UVNH42GLLA2 [UV42 NL2]	UVNH48GLLA2 [UV48 NL2]	UVNH60GLLA2 [UV60 NL2]	
Console	QA	AQNH09GALA0 [CQ09 NA0]	AQNH12GALA0 [CQ12 NA0]	AQNH18GALA0 [CQ18 NA0]							
Floor standing	PT2								APNH48GTLA0 [UP48 NT2]		
Wall mounted	SV					AJNW30GVLA0 [UJ30 NV2]	AJNW36GVLA0 [UJ36 NV2]				

<p>• Ceiling Cassette 4-way</p> <p>ATNH09GRLE2 [CT09 NR2] ATNH12GRLE2 [CT12 NR2] ATNH18GQLE2 [CT18 NQ2] ATNH24GPLE2 [CT24 NP2] ATNH30GPLE2 [UT30 NP2] ATNH36GNLE2 [UT36 NN2] ATNH42GMLE2 [UT42 NM2] ATNH48GMLE2 [UT48 NM2] ATNH60GMLE2 [UT60 NM2]</p> 	<p>• Ceiling & Floor</p> <p>AVNH09GELA2 [CV09 NE2] AVNH12GELA2 [CV12 NE2]</p> <p>• Ceiling Suspended</p> <p>UVNH18GJLA2 [CV18 NJ2] UVNH24GJLA2 [CV24 NJ2] UVNH30GJLA2 [UV30 NJ2] UVNH36GKLA2 [UV36 NK2] UVNH42GLLA2 [UV42 NL2] UVNH48GLLA2 [UV48 NL2] UVNH60GLLA2 [UV60 NL2]</p>  
<p>• Ceiling Concealed Duct – High static pressure</p> <p>ABNH18GHLA2 [CB18 NH2] ABNH24GHLA2 [CB24 NH2] ABNH30GGLA2 [UB30 NG2] ABNH36GGLA2 [UB36 NG2] ABNH42GRLA2 [UB42 NR2] ABNH48GRLA2 [UB48 NR2] ABNH60GRLA2 [UB60 NR2] ABNW18GM1A0 [CM18 N14] ABNW24GM1A0 [CM24 N14] ABNW30GM1A0 [UM30 N14] ABNW36GM2A0 [UM36 N24] ABNW42GM2A0 [UM42 N24] ABNW48GM3A0 [UM48 N34] ABNW60GM3A0 [UM60 N34]</p> 	<p>• Console</p> <p>AQNH09GALA0 [CQ09 NA0] AQNH12GALA0 [CQ12 NA0] AQNH18GALA0 [CQ18 NA0]</p> 
<p>• Ceiling Concealed Duct – Low static pressure</p> <p>ABNH09GL1A2 [CB09L N12] ABNH12GL2A2 [CB12L N22] ABNH18GL2A2 [CB18L N22] ABNH24GL3A2 [CB24L N32]</p> 	<p>• Wall mounted</p> <p>AJNW30GVLA0 [UJ30 NV2] AJNW36GVLA0 [UJ36 NV2]</p> 
<p>• Floor Standing</p> <p>APNH48GTLA0 [UP48 NT2]</p> 	

2.2 Outdoor units

DC Inverter	AUW096D [UU09W ULD]	AUW126D [UU12W ULD]	AUW186D2 [UU18W UE2]
No. of connectable indoor units	1		
Total capacity index of connectable indoor units(kW)	2.5	3.5	5.0
Power supply	1Ø, 220 - 240V, 50Hz		
Chassis			

DC Inverter	AUW246D2 [UU24W U42]	AUW306D2 [UU30W U42]	AUW366D2 [UU36W UO2]
No. of connectable indoor units	1		
Total capacity index of connectable indoor units(kW)	7.1	8.0	10.0
Power supply	1Ø, 220 - 240V, 50Hz		
Chassis			

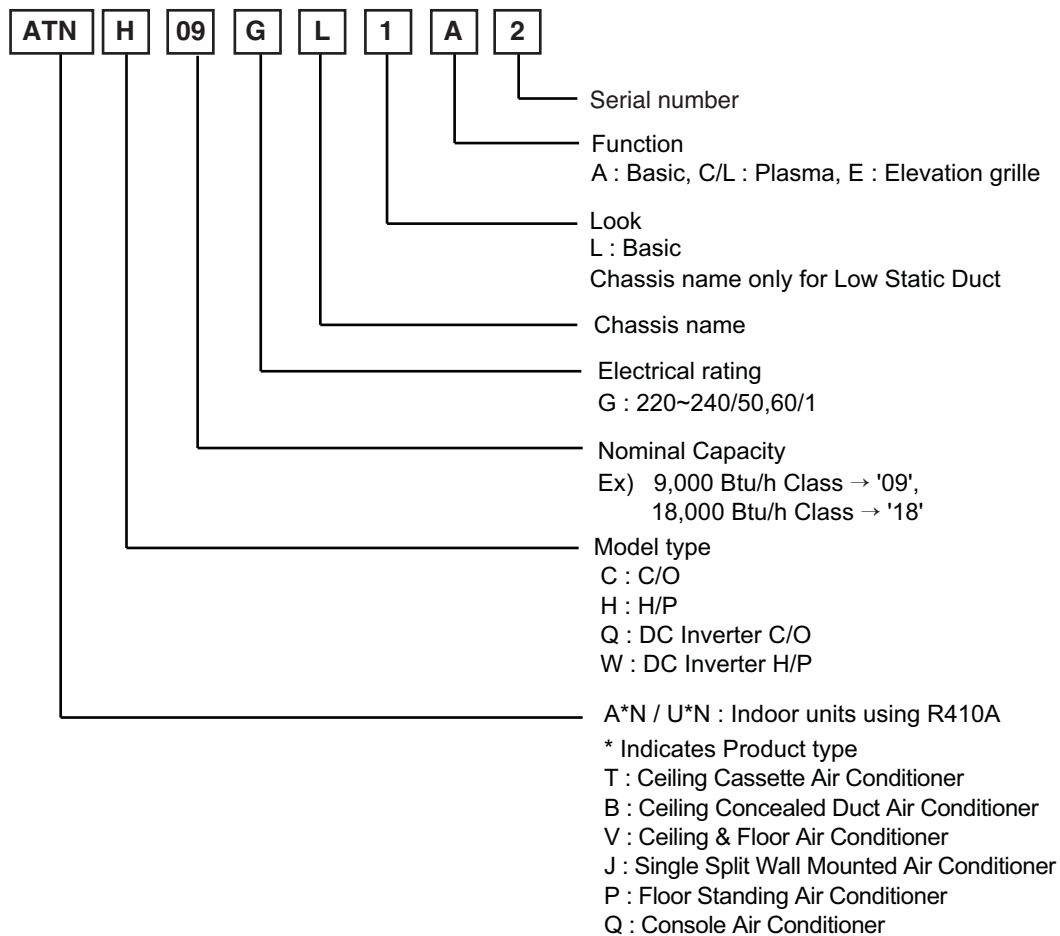
DC Inverter Synchro	AUW426D2 [UU42W U32]	AUW486D2 [UU48W U32]	AUW606D2 [UU60W U32]
No. of connectable indoor units	1 ~ 4		
Total capacity index of connectable indoor units(kW)	12.5	14.0	15.0
Power supply	1Ø, 220 - 240V, 50Hz		
Chassis			

DC Inverter	AUJW368D2 [UU37W UO2]
No. of connectable indoor units	1
Total capacity index of connectable indoor units(kW)	10.0
Power supply	3Ø, 380 - 415V, 50Hz
Chassis	

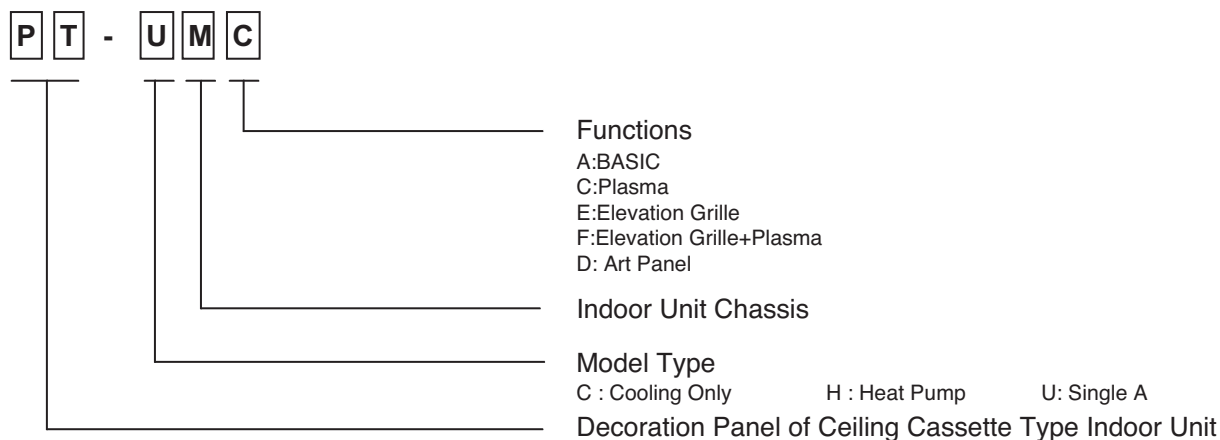
DC Inverter	AUJW428D2 [UU43W U32]	AUJW488D2 [UU49W U32]	AUJW608D2 [UU61W U32]
No. of connectable indoor units	1 ~ 4		
Total capacity index of connectable indoor units(kW)	12.5	14.0	15.0
Power supply	3Ø, 380 - 415V, 50Hz		
Chassis			

3. Nomenclature

3.1 Indoor Unit(Global)

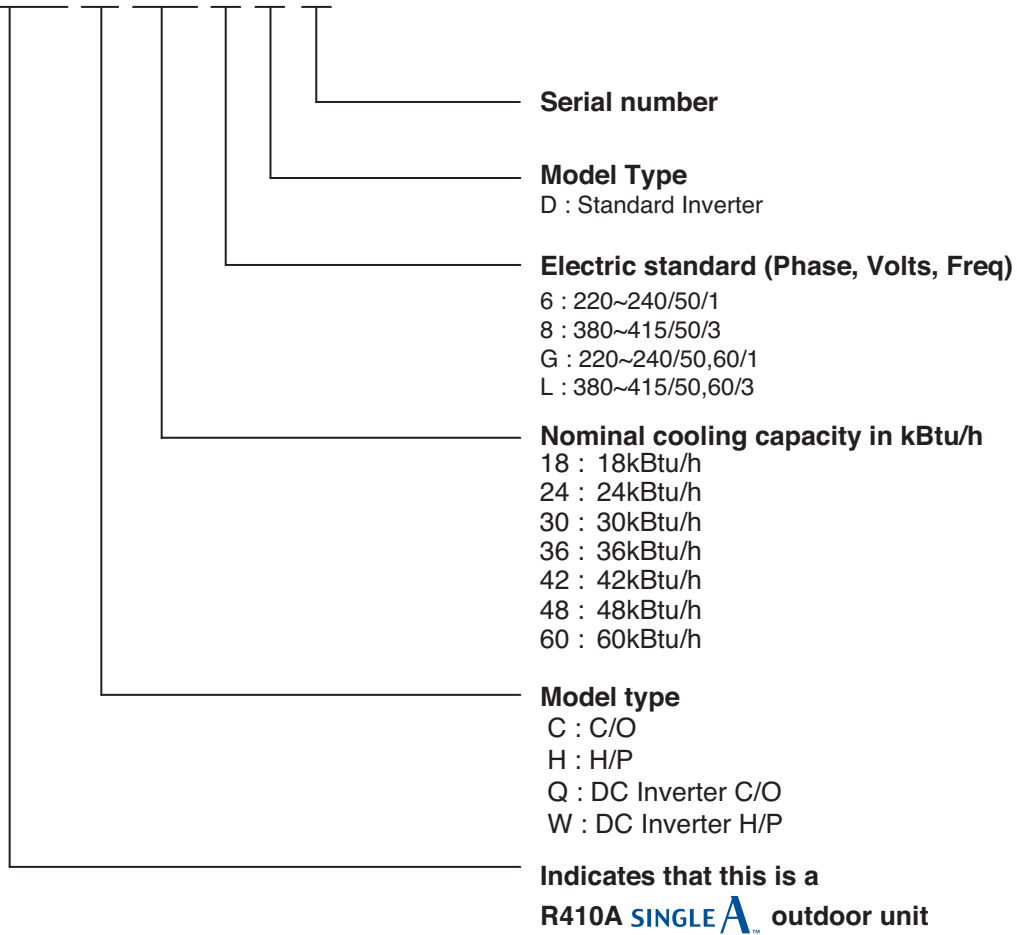


3.2 Decoration panel(For ceiling cassette models)

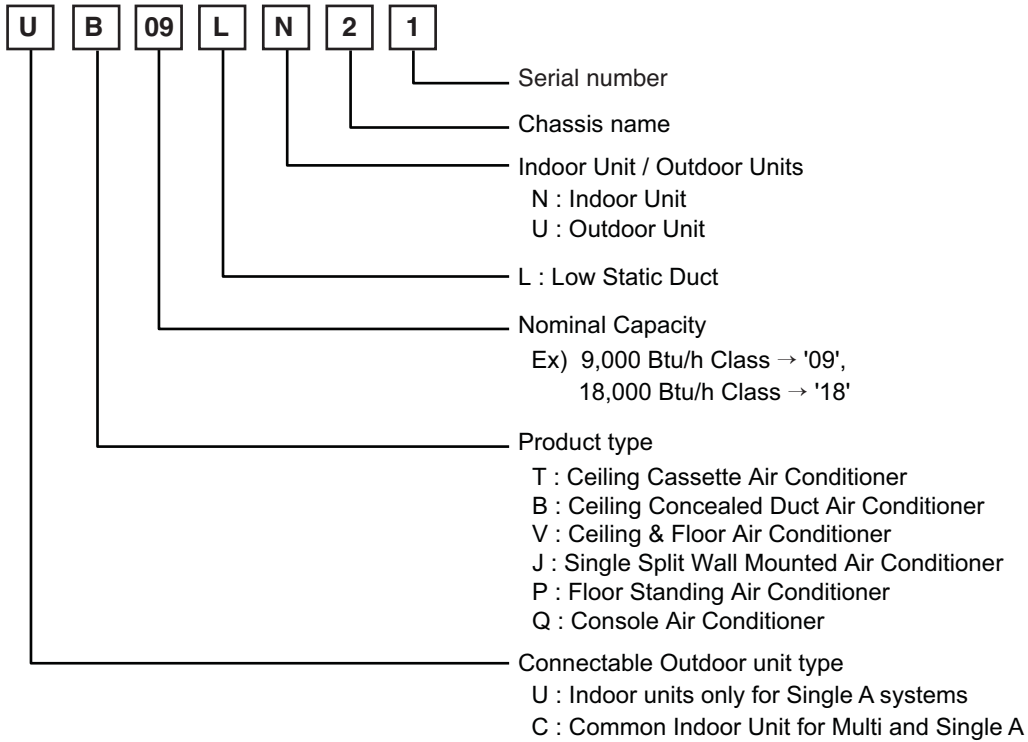


3.3 Outdoor Unit(Global)

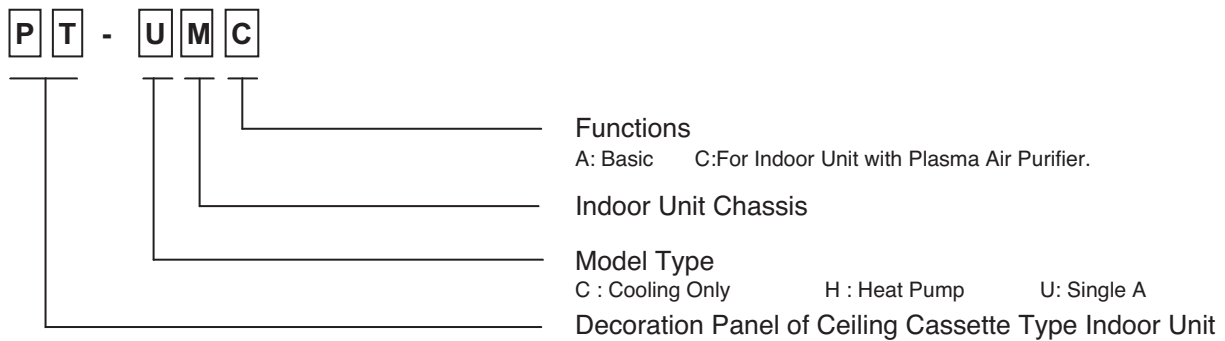
A U U W 2 4 6 D 2



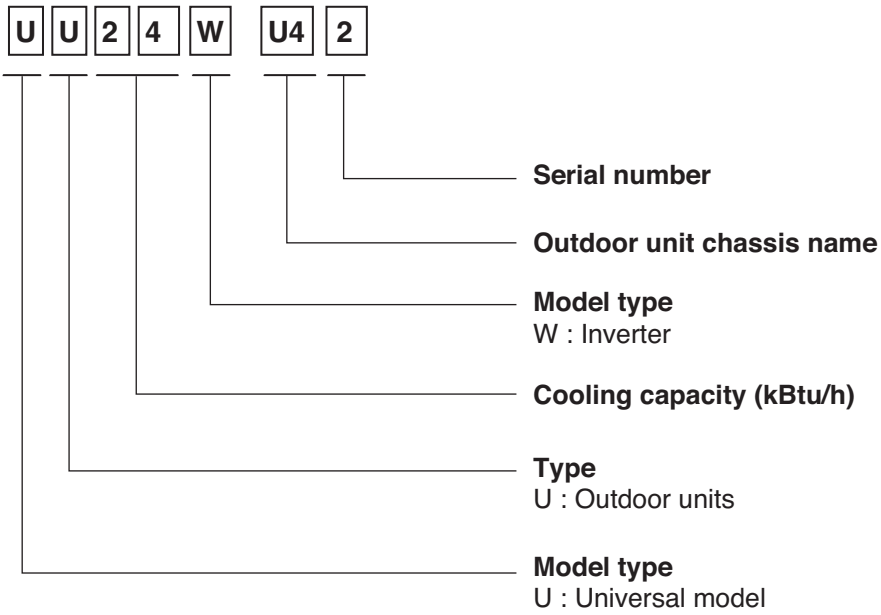
3.4 Indoor Unit(Europe)



3.5 Decoration panel(For ceiling cassette models)



3.6 Outdoor Unit(Europe)



Part 2 Functions & Controls

1. List of Functions & Accessory	16
2. Air flow	27
2.1 Auto swing (left & right)	27
2.2 Auto swing (up & down)	27
2.3 Chaos swing (up/down).....	27
2.4 Air flow step.....	28
2.5 Chaos wind (auto wind).....	28
2.6 Jet Cool Mode Operation	28
2.7 Swirl wind Swing	28
3. Air purifying	29
3.1 PLASMA Air Purifying System	29
4. Installation Functions	30
4.1 E.S.P. (External Static Pressure) Setting	30
4.2 High Ceiling operation.....	40
5. Reliability	41
5.1 Hot start.....	41
5.2 Self-diagnosis Function.....	41
5.3 Soft dry operation.....	41
6. Convenience Functions & Controls	42
6.1 Cooling & heating Operations	42
6.2 Auto cleaning operation	43
6.3 Auto changeover operation	43
6.4 Auto restart Opeartion.....	43
6.5 Child Lock Function.....	44
6.6 Forced operation	44
6.7 Group Control.....	45
6.8 Sleep Timer Operation	46
6.9 Timer(On/Off)	46
6.10 Weekly Program.....	47
6.11 Two Thermistor Control	49
7. Special Function & KIT	50
7.1 Low Ambient control.....	50
7.2 Space Control	50
7.3 Auto Elevation Grille.....	50

1. List of Functions & Accessory

1. 4-Way Ceiling Cassette Indoor

Category	Functions	ATNH09GRLE2 [CT09 NR2], ATNH12GRLE2 [CT12 NR2], ATNH18GQLE2 [CT18 NQ2]
Air flow	Air supply outlet	4
	Airflow direction control (left & right)	X
	Airflow direction control (up & down)	Auto
	Auto swing (left & right)	X
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	4 / 5 / 4
	Chaos wind(auto wind)	O
	Jet cool/heat	O / X
	Swirl wind	O
Air purifying	Triple filter (Deodorizing)	X
	Plasma air purifier	PTPKQ0
	Allergy Safe filter	X
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	O
	E.S.P. control*	X
	Electric heater	X
	High ceiling operation*	O
	Auto Elevation Grille*	X
Reliability	Hot start	O
	Self diagnosis	O
	Soft dry operation	O
Convenience	Auto changeover**	O**
	Auto cleaning	X
	Auto operation(artificial intelligence)**	O**
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	O
	Sleep mode	O
	Timer(on/off)	O
	Timer(weekly)*	O
Individual control	Two thermistor control*	O
	Wired remote controller	O
	Deluxe wired remote controller	PQRCUDS0 / PQRCUDS0B / PQRCUDS0S
	Simple wired remote controller	PQRCVCL0Q / PQRCVCL0QW
	Simple Wired remote controller(for hotel use)	PQRCHCA0Q / PQRCHCA0QW
CAC network function	Wireless remote controller	PQWRHQ0FDB
	General central controller (Non LGAP)	X
	Network Solution(LGAP)	O
	Dry contact	PQDSA(1)/PQDSB(1) / PQDSBC
Special function kit	PI 485(for Indoor Unit)	X
	Zone controller	X
	CTI(Communication transfer interface)	X
Others	Electronic thermostat	X
	Remote temperature sensor	PQRSTA0
	Telecom shelter controller	X

Part 2 Functions & Controls

Category	Functions	ATNH24GPLE2 [CT24 NP2], ATNH30GPLE2 [UT30 NP2], ATNH36GNLE2 [UT36 NN2], ATNH42GMLE2 [UT42 NM2], ATNH48GMLE2 [UT48 NM2], ATNH60GMLE2 [UT60 NM2]
Air flow	Air supply outlet	4
	Airflow direction control (left & right)	X
	Airflow direction control (up & down)	Auto
	Auto swing (left & right)	X
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	4 / 5 / 4
	Chaos wind(auto wind)	O
	Jet cool/heat	O / X
	Swirl wind	O
Air purifying	Triple filter (Deodorizing)	X
	Plasma air purifier	PTPKM0
	Allergy Safe filter	X
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	O
	E.S.P. control*	X
	Electric heater	X
	High ceiling operation*	O
	Auto Elevation Grille*	PTEGM0
Reliability	Hot start	O
	Self diagnosis	O
	Soft dry operation	O
Convenience	Auto changeover**	O**
	Auto cleaning	X
	Auto operation(artificial intelligence)**	O**
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	O
	Sleep mode	O
	Timer(on/off)	O
	Timer(weekly)*	O
Two thermistor control*	O	
Individual control	Wired remote controller	O
	Deluxe wired remote controller	PQRCUDS0 / PQRCUDS0B / PQRCUDS0S
	Simple wired remote controller	PQRCVCL0Q / PQRCVCL0QW
	Simple Wired remote controller(for hotel use)	PQRCHCA0Q / PQRCHCA0QW
	Wireless remote controller	PQWRHQ0FDB
CAC network function	General central controller (Non LGAP)	X
	Network Solution(LGAP)	O
	Dry contact	PQDSA(1)/PQDSB(1) / PQDSBC
	PI 485(for Indoor Unit)	X
Special function kit	Zone controller	X
	CTI(Communication transfer interface)	X
	Electronic thermostat	X
Others	Remote temperature sensor	PQRSTA0
	Telecom shelter controller	X

2. Ceiling Concealed Duct Indoor

Category	Functions	ABNH18GHLA2 [CB18 NH2], ABNH24GHLA2 [CB24 NH2], ABNH30GGLA2 [UB30 NG2], ABNH36GGLA2 [UB36 NG2], ABNH42GRLA2 [UB42 NR2], ABNH48GRLA2 [UB48 NR2], ABNH60GRLA2 [UB60 NR2]
Air flow	Air supply outlet	2
	Airflow direction control (left & right)	X
	Airflow direction control (up & down)	X
	Auto swing (left & right)	X
	Auto swing (up & down)	X
	Airflow steps (fan/cool/heat)	3 / 3 / 3
	Chaos wind(auto wind)	X
	Jet cool/heat	O / X
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Plasma air purifier	X
	Allergy Safe filter	X
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	ABDPG
	E.S.P. control*	O
	Electric heater	X
	High ceiling operation*	X
	Auto Elevation Grille*	X
Reliability	Hot start	O
	Self diagnosis	O
	Soft dry operation	O
Convenience	Auto changeover**	O**
	Auto cleaning	X
	Auto operation(artificial intelligence)**	O**
	Auto Restart	O
	Child lock*	O
	Forced operation	X
	Group control*	O
	Sleep mode	X
	Timer(on/off)	O
	Timer(weekly)*	O
Two thermistor control*	O	
Individual control	Standard Wired remote controller	O
	Deluxe wired remote controller	X
	Simple wired remote controller	X
	Simple Wired remote controller(for hotel use)	X
	Wireless remote controller	X
CAC network function	General central controller (Non LGAP)	X
	Network Solution(LGAP)	O
	Dry contact	PQDSA(1)/PQDSB(1) / PQDSBC
	PI 485(for Indoor Unit)	X
Special function kit	Zone controller	ABZCA
	CTI(Communication transfer interface)	X
	Electronic thermostat	X
Others	Remote temperature sensor	PQRSTA0
	Telecom shelter controller	X

Category	Functions	ABNW18GM1A0 [CM18 N14], ABNW24GM1A0 [CM24 N14] ABNW30GM1A0 [UM30 N14], ABNW36GM2A0 [UM36 N24] ABNW42GM2A0 [UM42 N24], ABNW48GM3A0 [UM48 N34] ABNW60GM3A0 [UM60 N34]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	X
	Airflow direction control (up & down)	X
	Auto swing (left & right)	X
	Auto swing (up & down)	X
	Airflow steps (fan/cool/heat)	3 / 3 / 3
	Chaos wind(auto wind)	X
	Jet cool/heat	X / X
Air purifying	Swirl wind	X
	Triple filter (Deodorizing)	X
	Plasma air purifier	X
	Allergy Safe filter	X
Installation	Long-life prefilter (washable / anti-fungus)	O
	Drain pump	ABDPG
	E.S.P. control*	O
	Electric heater	X
	High ceiling operation*	X
Reliability	Auto Elevation Grille*	X
	Hot start	O
	Self diagnosis	O
Convenience	Soft dry operation	O
	Auto changeover**	O
	Auto cleaning	X
	Auto operation(artificial intelligence)**	O
	Auto Restart	O
	Child lock*	O
	Forced operation	X
	Group control*	O
	Sleep mode	X
	Timer(on/off)	O
Timer(weekly)*	O	
Individual control	Two thermistor control*	O
	Standard Wired remote controller	O
	Deluxe wired remote controller	X
	Simple wired remote controller	X
	Simple Wired remote controller(for hotel use)	X
Network function	Wireless remote controller	PQWRHQ0FDB
	General central controller (Non LGAP)	X
	Network Solution(LGAP)	O
	Dry contact	PQDSA(1)/PQDSB(1) / PQDSBC
Special function kit	PI 485(for Indoor Unit)	X
	Zone controller	ABZCA
	CTI(Communication transfer interface)	X
Others	Electronic thermostat	X
	Remote temperature sensor	PQRSTA0
	Group control wrie	PZCWRCG3
	Telecom shelter controller	X

Note

- * : These functions need to connect the wired remote controller.
 - ** : Auto Changeover function can be operated when connected with Single A.
Auto Operation function can be operated whne connected with Mutli F/FDX.
 - Group control, Dry Contact, Auto Changeover functions are not available for units which are connected with synchro models.
- O : Applied X : Not applied
- Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

3. Ceiling & floor

Type		Ceiling & floor	Ceiling Suspended
Category	Functions	AVNH09GELA2 [CV09 NE2] AVNH12GELA2 [CV12 NE2]	UVNH18GJLA2 [CV18 NJ2], UVNH24GJLA2 [CV24 NJ2], UVNH30GJLA2 [UV30 NJ2], UVNH36GKLA2 [UV36 NK2], UVNH42GLLA2 [UV42 NL2], UVNH60GLLA2 [UV60 NL2]
Air flow	Air supply outlet	1	1
	Airflow direction control (left & right)	Manual	Manual
	Airflow direction control (up & down)	Auto	Auto
	Auto swing (left & right)	X	X
	Auto swing (up & down)	O	O
	Airflow steps (fan/cool/heat)	3 / 4 / 3	3 / 4 / 3
	Chaos wind(auto wind)	O	O
	Jet cool/heat	O / X	O / X
Air purifying	Swirl wind	X	X
	Triple filter (Deodorizing)	X	X
	Plasma air purifier	X	X
	Allergy Safe filter	X	X
Installation	Long-life prefilter (washable / anti-fungus)	O	O
	Drain pump	X	X
	E.S.P. control*	X	X
	Electric heater	X	X
	High ceiling operation*	X	O
Reliability	Auto Elevation Grille*	X	X
	Hot start	O	O
	Self diagnosis	O	O
Convenience	Soft dry operation	O	O
	Auto changeover**	O**	O**
	Auto cleaning	X	X
	Auto operation(artificial intelligence)**	O**	O**
	Auto Restart	O	O
	Child lock*	O	O
	Forced operation	O	O
	Group control*	O	O
	Sleep mode	O	O
Timer(on/off)	O	O	
Individual control	Timer(weekly)*	O	O
	Two thermistor control*	O	O
	Wired remote controller	PQRCVSL0/PQRCVSL0QW	PQRCVSL0/PQRCVSL0QW
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
Network function	Simple Wired remote controller(for hotel use)	X	X
	Wireless remote controller	O	O
	General central controller (Non LGAP)	X	X
	Network Solution(LGAP)	O	O
Special function kit	Dry contact	PQDSA(1)/PQDSB(1) / PQDSBC	PQDSA(1)/PQDSB(1) / PQDSBC
	PI 485(for Indoor Unit)	X	X
	Zone controller	X	X
Others	CTI(Communication transfer interface)	X	X
	Electronic thermostat	X	X
Others	Remote temperature sensor	PQRSTA0	PQRSTA0
	Telecom shelter controller	X	X

4. Wall mounted

Category	Function	AJNW36GVLA0 [UJ36 NV2], AJNW30GVLA0 [UJ30 NV2]
Air flow	Air supply outlet	1
	Airflow direction control(left & right)	Manual
	Airflow direction control(up & down)	Auto
	Auto swing(left & right)	X
	Auto swing(up & down)	O
	Airflow steps(fan/cool/heat)	3 / 4 / 4
	Chaos wind(Auto wind)	O
	Jet cool/heat	O / O
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	O
	Plasma air purifier	X
	Allergy Safe filter	X
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	X
	E.S.P. control	X
	Electric heater	X
	High ceiling operation	X
	Auto Elevation Grille	X
Reliability	Hot start	O
	Self diagnosis	O
	Soft dry operation	O
Convenience	Auto changeover**	O
	Auto cleaning	O
	Auto operation(artificial intelligence)	X
	Auto restart	O
	Child lock*	O
	Forced operation	O
	Group control	X
	Sleep mode	O
	Timer(on/off)	O
	Timer(weekly)	X
Two thermistor control	X	
Individual control	Wired remote controller	PQRCVSL0 / PQRCVSL0QW
	Deluxe wired remote controller	X
	Simple wired remote controller	X
	Wired remote controller(for hotel use)	X
	Wireless remote controller	O
CAC network function	General central controller (Non LGAP)	X
	Network Solution(LGAP)	O
	Dry contact	PQDSA(1) / PQDSB(1) / PQDSC
	PI 485(for indoor unit)	X
Special function kit	Zone controller	X
	CTI(Communication transfer interface)	X
	Electronic thermostat	X
Others	Remote temperature sensor	X
	Telecom shelter controller	X

Note

1. * : These functions need to connect the wired remote controller.

2. ** : Auto Changeover function can be operated when connected with Single A.

O : Applied X : Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

5. Outdoor

DC Inverter Single A (1Ø)

Category	Functions	AUUW096D [UU09W ULD]	AUUW126D [UU12W ULD]	AUUW186D2 [UU18W UE2]
Reliability	Defrost / Deicing	O	O	O
	High pressure switch	X	X	X
	Low pressure switch	X	X	X
	Phase protection	X	X	X
	Restart delay (3-minutes)	O	O	O
	Self diagnosis	O	O	O
	Soft start	O	O	O
Convenience	Test function	O	O	X
Convenience	Night Silent Operation	X	X	O
CAC network function	Network solution(LGAP)	X	X	O

Device		AUUW096D [UU09W ULD]	AUUW126D [UU12W ULD]	AUUW186D2 [UU18W UE2]
Central Controller	Simple Controller	X	X	PQCSB101S0
	Function controller	X	X	PQCSB101S0 + PQCSC101S0
	Function Scheduler	X	X	PQCSB101S0 + PQCSD130A0
	AC Ez	X	X	PQCSZ250S0
	AC Smart II	X	X	PQCSW320A1E
	Option Kit (SD card type)	X	X	PQCSE341A0 / PQCSE342A0
	ACP(Advanced Control Platform)	X	X	PQCPA11A0E / PQCPB11A0E
	AC Manager	X	X	PQCSS520A0E
	PI485	X	X	PMNFP14A0/PMNFP14A1
	DO(Digital Output) Kit	X	X	PQNFP00T0
BNU (Building Network Unit)	LONWORKS Gateway	X	X	PQNFB16A1
	BACnet Gateway	X	X	PQNFB17B0
Installation	Y branch	X	X	X
	Header branch	X	X	X
	Air Guide	X	X	X
ODU Dry Contact		X	X	X
Low Ambient Kit		O (Logical operation)	O (Logical operation)	O (Logical operation)

[Note]

• O: Applied, • X: Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

Part 2 Functions & Controls

Category	Functions	AUUW246D2 [UU24W U42]	AUUW306D2 [UU30W U42]	AUUW366D2 [UU36W UO2]
Reliability	Defrost / Deicing	O	O	O
	High pressure switch	X	X	X
	Low pressure switch	X	X	X
	Phase protection	X	X	X
	Restart delay (3-minutes)	O	O	O
	Self diagnosis	O	O	O
	Soft start	O	O	O
	Test function	X	X	X
Convenience	Night Silent Operation	O	O	O
CAC network function	Network solution(LGAP)	O	O	O

Device	AUUW246D2 [UU24W U42]	AUUW306D2 [UU30W U42]	AUUW366D2 [UU36W UO2]	
Central Controller	Simple Controller	PQCSB101S0	PQCSB101S0	PQCSB101S0
	Function controller	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0
	Function Scheduler	PQCSB101S0 + PQCD130A0	PQCSB101S0 + PQCD130A0	PQCSB101S0 + PQCD130A0
	AC Ez	PQCSZ250S0	PQCSZ250S0	PQCSZ250S0
	AC Smart II	PQCSW320A1E	PQCSW320A1E	PQCSW320A1E
	Option Kit (SD card type)	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0
	ACP(Advanced Control Platform)	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E
	AC Manager	PQCSS520A0E	PQCSS520A0E	PQCSS520A0E
	PI485	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1
	DO(Digital Output) Kit	PQNFP00T0	PQNFP00T0	PQNFP00T0
BNU (Building Network Unit)	LONWORKS Gateway	PQNFB16A1	PQNFB16A1	PQNFB16A1
	BACnet Gateway	PQNFB17B0	PQNFB17B0	PQNFB17B0
Installation	Y branch	X	X	X
	Header branch	X	X	X
	Air Guide	X	X	X
ODU Dry Contact	X	X	O (On/off control)	
Low Ambient Kit	O (Logical operation)	O (Logical operation)	O (Logical operation)	

[Note]

• O: Applied, • X: Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

Category	Functions	AUUW426D2 [UU42W U32]	AUUW486D2 [UU48W U32]	AUUW606D2 [UU60W U32]
Reliability	Defrost / Deicing	O	O	O
	High pressure switch	X	X	X
	Low pressure switch	X	X	X
	Phase protection	X	X	X
	Restart delay (3-minutes)	O	O	O
	Self diagnosis	O	O	O
	Soft start	O	O	O
	Test function	X	X	X
Convenience	Night Silent Operation	O	O	O
CAC network function	Network solution(LGAP)	O	O	O

Device		AUUW426D2 [UU42W U32]	AUUW486D2 [UU48W U32]	AUUW606D2 [UU60W U32]
Central Controller	Simple Controller	PQCSB101S0	PQCSB101S0	PQCSB101S0
	Function controller	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0
	Function Scheduler	PQCSB101S0 + PQCSD130A0	PQCSB101S0 + PQCSD130A0	PQCSB101S0 + PQCSD130A0
	AC Ez	PQCSZ250S0	PQCSZ250S0	PQCSZ250S0
	AC Smart II	PQCSW320A1E	PQCSW320A1E	PQCSW320A1E
	Option Kit (SD card type)	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0
	ACP(Advanced Control Platform)	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E
	AC Manager	PQCSS520A0E	PQCSS520A0E	PQCSS520A0E
	PI485	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1
	DO(Digital Output) Kit	PQNFP00T0	PQNFP00T0	PQNFP00T0
BNU (Building Network Unit)	LONWORKS Gateway	PQNFB16A1	PQNFB16A1	PQNFB16A1
	BACnet Gateway	PQNFB17B0	PQNFB17B0	PQNFB17B0
Installation	Y branch	X	X	X
	Header branch	X	X	X
	Air Guide	X	X	X
ODU Dry Contact		O (On/off control)	O (On/off control)	O (On/off control)
Low Ambient Kit		O (Logical operation)	O (Logical operation)	O (Logical operation)

[Note]

• O: Applied, • X: Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

Part 2 Functions & Controls

Category	Functions	AUUW368D2 [UU37W UO2]	AUUW428D2 [UU43W U32]
Reliability	Defrost / Deicing	O	O
	High pressure switch	X	X
	Low pressure switch	X	X
	Phase protection	O	O
	Restart delay (3-minutes)	O	O
	Self diagnosis	O	O
	Soft start	O	O
	Test function	X	X
Convenience	Night Silent Operation	O	O
network function	Network solution(LGAP)	O	O

Device		AUUW368D2 [UU37W UO2]	AUUW428D2 [UU43W U32]
Central Controller	Simple Controller	PQCSB101S0	PQCSB101S0
	Function controller	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0
	Function Scheduler	PQCSB101S0 + PQCSD130A0	PQCSB101S0 + PQCSD130A0
	AC Ez	PQCSZ250S0	PQCSZ250S0
	AC Smart II	PQCSW320A1E	PQCSW320A1E
	Option Kit (SD card type)	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0
	ACP(Advanced Control Platform)	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E
	AC Manager	PQCSS520A0E	PQCSS520A0E
	PI485	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1
	DO(Digital Output) Kit	PQNFP00T0	PQNFP00T0
BNU (Building Network Unit)	LONWORKS Gateway	PQNFB16A1	PQNFB16A1
	BACnet Gateway	PQNFB17B0	PQNFB17B0
Installation	Y branch	X	X
	Header branch	X	X
	Air Guide	X	X
ODU Dry Contact		O (On/off control)	O (On/off control)
Low Ambient Kit		O (Logical operation)	O (Logical operation)

[Note]

• O: Applied, • X: Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

Category	Functions	AUUW488D2 [UU49W U32]	AUUW608D2 [UU61W U32]
Reliability	Defrost / Deicing	O	O
	High pressure switch	X	X
	Low pressure switch	X	X
	Phase protection	O	O
	Restart delay (3-minutes)	O	O
	Self diagnosis	O	O
	Soft start	O	O
	Test function	X	X
Convenience	Night Silent Operation	O	O
network function	Network solution(LGAP)	O	O

Device	AUUW488D2 [UU49W U32]	AUUW608D2 [UU61W U32]	
Central Controller	Simple Controller	PQCSB101S0	PQCSB101S0
	Function controller	PQCSB101S0 + PQCSC101S0	PQCSB101S0 + PQCSC101S0
	Function Scheduler	PQCSB101S0 + PQCSD130A0	PQCSB101S0 + PQCSD130A0
	AC Ez	PQCSZ250S0	PQCSZ250S0
	AC Smart II	PQCSW320A1E	PQCSW320A1E
	Option Kit (SD card type)	PQCSE341A0 / PQCSE342A0	PQCSE341A0 / PQCSE342A0
	ACP(Advanced Control Platform)	PQCPA11A0E / PQCPB11A0E	PQCPA11A0E / PQCPB11A0E
	AC Manager	PQCSS520A0E	PQCSS520A0E
	PI485	PMNFP14A0/PMNFP14A1	PMNFP14A0/PMNFP14A1
	DO(Digital Output) Kit	PQNFP00T0	PQNFP00T0
BNU (Building Network Unit)	LONWORKS Gateway	PQNFB16A1	PQNFB16A1
	BACnet Gateway	PQNFB17B0	PQNFB17B0
Installation	Y branch	X	X
	Header branch	X	X
	Air Guide	X	X
ODU Dry Contact	O (On/off control)	O (On/off control)	
Low Ambient Kit	O (Logical operation)	O (Logical operation)	

[Note]

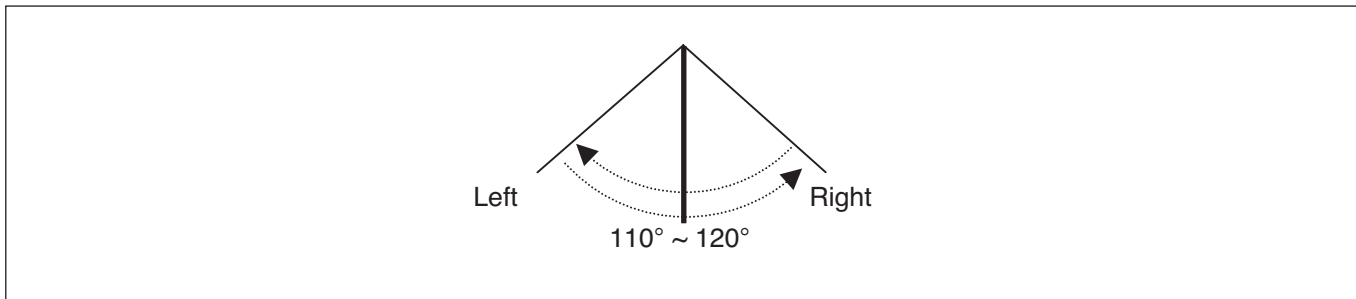
• O: Applied, • X: Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

2. Air flow

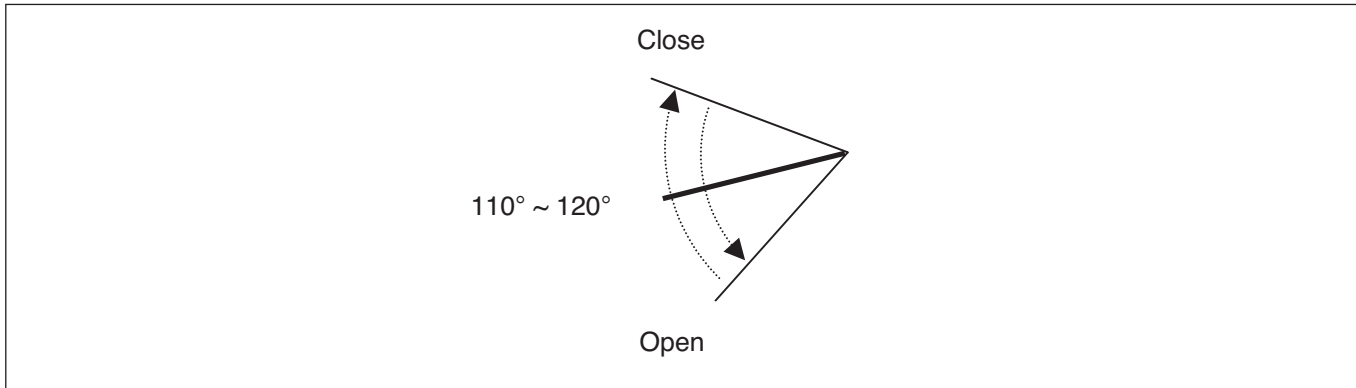
2.1 Auto swing (left & right)

- By the horizontal airflow direction control key input, the left/right louver automatically operates with the auto swing or it is fixed to the desired direction.



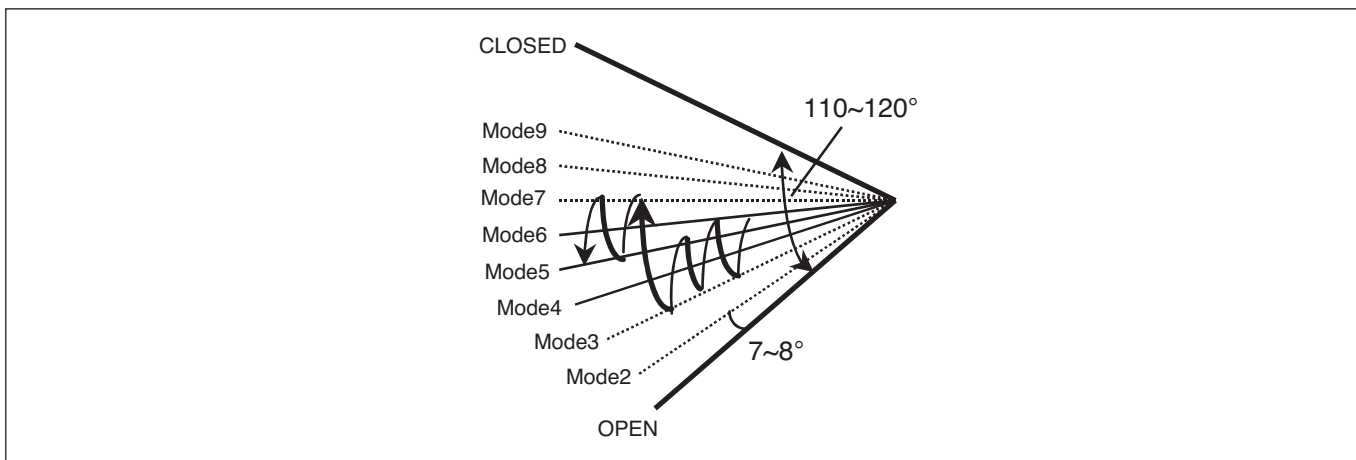
2.2 Auto swing (up & down)

- By the auto swing key input, the upper/lower vane automatically operates with the auto swing or it is fixed to the desired direction.



2.3 Chaos swing (up/down)

- By the Chaos swing key input, the upper/lower vane automatically operates with the chaos swing or it is fixed to the desired direction.



NOTE: Some Models are different by swing width and swing pattern.

2.4 Air flow step

- Indoor fan motor control have 6 steps.
- Air volume is controlled "SH", "H", "Med", "Low" by remote controller.
- "LL" step is selected automatically in Hot start operation.

Step	Discription
LL	Very low, In heating mode
L	Low
M	Med
H	High
SH	Super high
Auto	Chaos wind

2.5 Chaos wind (auto wind)

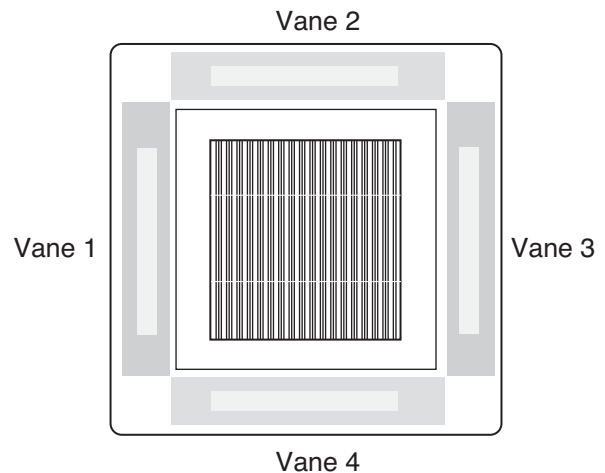
- When "Auto" step selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation

2.6 Jet Cool Mode Operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min. at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

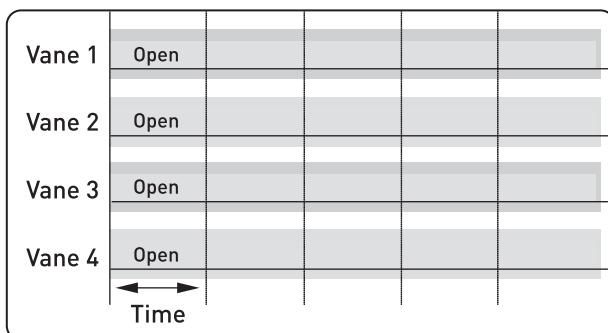
2.7 Swirl wind Swing

- It is the function for comfort cooling/heating operation.
- The diagonal two louvers are opened the more larger than the other louvers. After one minute, it is opposite.

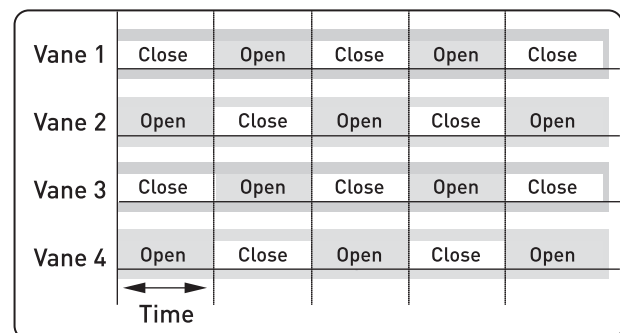


- Comparison of Air Flow Types

4-Open (conventional)



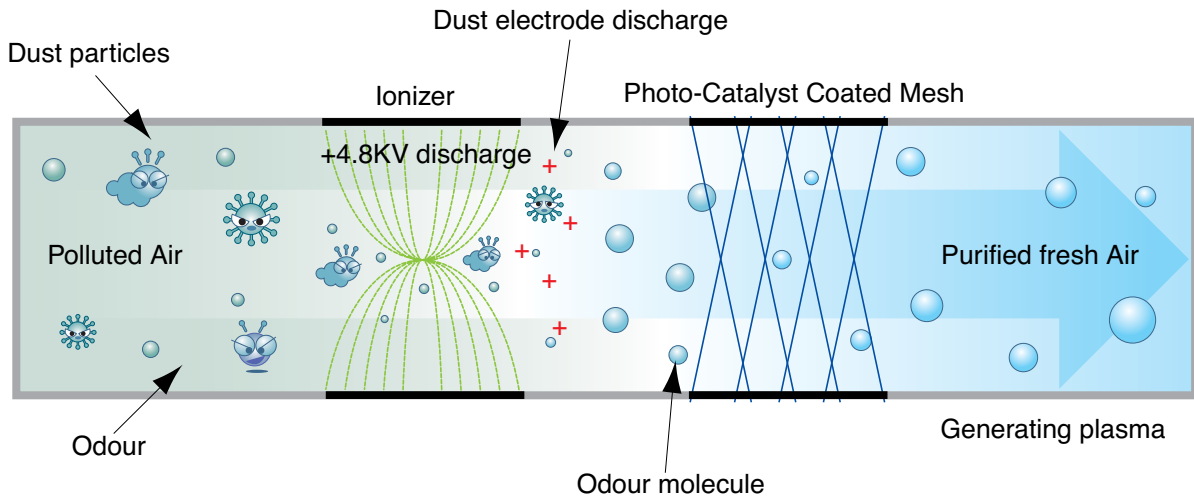
Swirl Swing (New)



3. Air purifying

3.1 PLASMA Air Purifying System

The PLASMA Air Purifying System not only removes microscopic contaminants and dust, but also removes house mites, pollen, and pet fur to help prevent allergic diseases like asthma. This filter that can be used over and over again by simply washing with water.



4. Installation Functions

4.1 E.S.P. (External Static Pressure) Setting

This function is applied to only duct type. Setting this in other cases will cause malfunction.

- 1** Press button for 4 seconds to enter the installer setting mode until timer segment displays "01:01".
- 2** If pressing button repeatedly, it moves to static pressure selection menu as picture below.
- 3** Select static pressure by pressing button.
(01:V-H, 02:F-H, 03:V-L, 04:F-L)
- 4** Press button to save.
- 5** Pressing button will exit settings mode.
* After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
* When exiting without pressing set button, the manipulated value is not reflected.

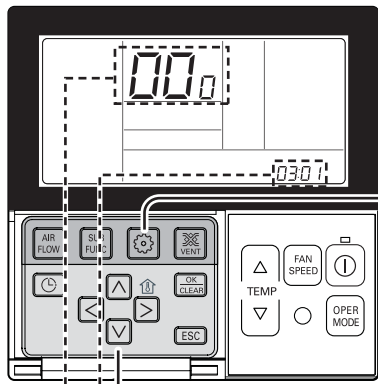
<Static Pressure Setting Table>

Pressure selection		Function	
		Zone state	ESP standard value
01	V-H	Variable	High
02	F-H	Fixed	High
03	V-L	Variable	Low
04	F-L	Fixed	Low

Part 2 Functions & Controls

This is the function that decides the strength of the wind for each wind level and because this function is to make the installation easier.

- If you set ESP incorrectly, the air conditioner may malfunction.
- This setting must be carried out by a certificated-technician.

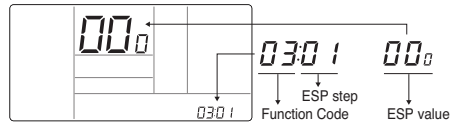


Function code,
ESP code

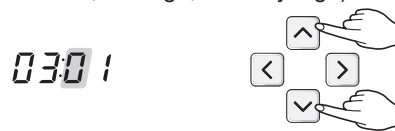
ESP value

- 1 If pressing button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode.
Please press more than 3 seconds for sure.

- 2 If entering into ESP setup mode by using button, it indicates as the picture below.



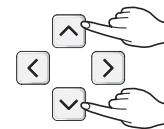
- 3 Select ESP fan step by pressing button. (01: very low, 02: low, 03: medium, 04: high, 05: very high)



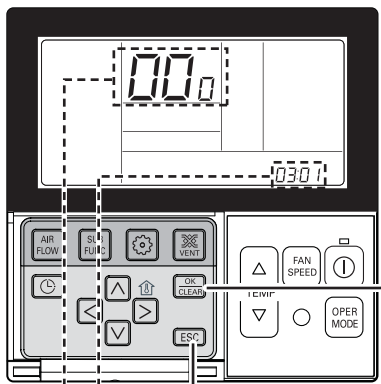
- 4 Move to ESP value setting by pressing button.
(It is 000 when delivering from the warehouse.)



- 5 Press button to setup ESP value.
(It is possible to setup ESP value from 1 to 255, and 1 is the smallest and 255 is the biggest.)



- When setting ESP value on the product without very weak wind or power wind function, it may not work.



Function code, ESP code

ESP value

- 6 Select ESP fan step again by using button and setup ESP value, as No. 4 and 5, that corresponds each wind flow

- 7 Press button to save.

- 8 Press button to exit.
* After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
* When exiting without pressing set button, the manipulated value is not reflected.

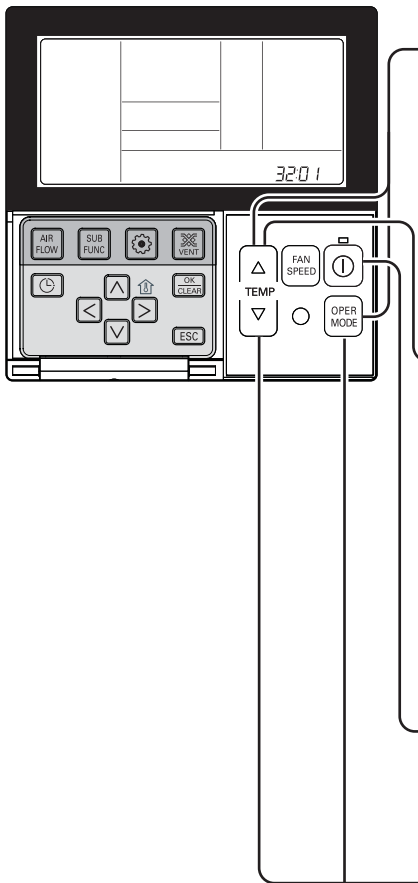
- Please be careful not to change the ESP value for each fan step.
- It does not work to setup ESP value for very low/power step for some products.
- ESP value is available for specific range belongs to the product.



Installer Setting - Static Pressure Step Setting


This function is applied to only duct type. Setting this in other cases will cause malfunction.

This function is only available on some products.

This is the function that static pressure of the product is divided in 11 steps for setting.




1 When pressing the  button and  button simultaneously for more than 3 seconds, the system will be entered into the installer setting mode.

- After entering into the installer setting mode, select the static pressure step setting code value by pressing the  button.


* Static pressure step setting code value : 32



2 Select the desired setting value with the temperature up(s), down(t) button.



Function Code Existing condition

00: use static pressure (code 06) set value
01~ 11: static pressure step (code 32) set value

3 When pressing  button, currently established static pressure value will be set up.

4 When pressing the  button and  button simultaneously for more than 3 seconds after the setting has been completed, the setting mode will be released.

- If there isn't any button input for more than 25 seconds, the installer setting mode will also be released.

- Static Pressure (Code 06) setting will not be used if Static Pressure Step (Code 32) setting is being used.
- For the static pressure value for each step, refer to the next page Table. 1

E.S.P. setting value (reference)

Table 1

ABNH18GHLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	2.5(25)	4(39)	6(59)	8(78)
100	12.8	-	-	-
105	13.9	-	-	-
110	15.2	12.7	-	-
115	16.5	14.0	-	-
120	17.8	15.3	12.7	-
125	-	16.5	14.0	-
130	-	17.8	15.3	12.6
135	-	-	16.5	13.5
140	-	-	17.5	14.5
145	-	-	-	16.5

ABNH24GHLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	2.5(25)	4(39)	6(59)	8(78)
105	13.9	-	-	-
110	15.2	12.7	-	-
115	16.5	14.0	-	-
120	17.8	15.3	12.7	-
125	-	16.5	14.0	-
130	-	17.8	15.3	12.6
135	-	-	16.5	13.5
140	-	-	17.6	14.5
145	-	-	-	16.5
150	-	-	-	18.0

ABNH30GGLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	4(49)	6(59)	8(78)	10(98)
100	20.8	-	-	-
105	23.2	19.5	-	-
110	26.0	21.5	-	-
115	-	23.5	19.1	-
120	-	26.3	21.6	-
125	-	-	24.0	19.9
130	-	-	27.0	22.7
135	-	-	-	25.9
140	-	-	-	-

ABNH36GGLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	4(49)	6(59)	8(78)	10(98)
115	25.9	-	-	-
120	27.9	-	-	-
125	29.9	26.4	-	-
130	32.0	28.5	25.0	-
135	-	30.7	27.5	-
140	-	32.9	29.9	26.0
145	-	-	32.3	28.5
150	-	-	-	31.0
155	-	-	-	-

ABNH42GRLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	6(59)	8(78)	10(98)	12(118)
85	31.5	-	-	-
90	36.3	29.8	-	-
95	41.3	34.5	28.4	-
100	45.4	39.7	33.5	27.3
105	-	44.1	38.6	33.1
110	-	-	44.2	38.9
115	-	-	-	44.7

ABNH48GRLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]			
	6(59)	8(78)	10(98)	12(118)
85	31.5	-	-	-
90	36.3	29.8	-	-
95	41.3	34.5	28.4	-
100	45.4	39.7	33.5	27.3
105	-	44.1	38.6	33.1
110	-	-	44.2	38.9
115	-	-	-	44.7

ABNH60GRLA2

(Unit: CMM)

Setting Value	Static Pressure[mmAq(Pa)]				
	6(59)	8(78)	10(98)	12(118)	14(137)
95	41.3	-	-	-	-
100	45.4	39.7	-	-	-
105	49.5	44.1	38.6	-	-
110	-	48.5	44.2	38.9	-
115	-	-	49.8	44.7	42.2
120	-	-	-	50.5	48.1

Part 2 Functions & Controls

Model	Step	CMM	Static Pressure[mmAq(Pa)]										
			2(20)	2.5(25)	3(29)	4(39)	6(59)	8(78)	10(98)	12(118)	13(127)	14(137)	15(147)
			Setting Value										
			32:01	32:02	32:03	32:04	32:05	32:06	32:07	32:08	32:09	32:10	32:11
ABNW18GM1A0	LOW	13	73	74	77	88	93	103	111	117	120	125	128
	MID	14.5	76	77	85	91	97	107	114	121	125	128	131
	HIGH	16.5	85	87	90	94	103	110	118	125	128	131	134
ABNW24GM1A0	LOW	14.5	76	77	85	89	97	107	114	121	125	128	131
	MID	16.5	85	87	90	94	103	110	118	125	128	131	134
	HIGH	18	90	92	95	99	108	115	122	129	132	135	138

Model	Step	CMM	Static Pressure[mmAq(Pa)]										
			2.5(25)	4(39)	5(49)	6(59)	7(69)	8(78)	9(88)	10(98)	11(108)	13(127)	15(147)
			Setting Value										
			32:01	32:02	32:03	32:04	32:05	32:06	32:07	32:08	32:09	32:10	32:11
ABNW30GM1A0	LOW	18	96	102	107	104	114	118	122	125	127	132	134
	MID	20	102	110	114	110	121	125	127	130	133	135	137
	HIGH	22	110	117	121	118	127	130	133	136	137	138	140

Model	Step	CMM	Static Pressure[mmAq(Pa)]										
			4(39)	5(49)	6(59)	7(69)	8(78)	9(88)	10(98)	11(108)	12(118)	13(127)	15(147)
			Setting Value										
			32:01	32:02	32:03	32:04	32:05	32:06	32:07	32:08	32:09	32:10	32:11
ABNW36GM2A0	LOW	24	88	91	95	100	101	108	113	115	118	118	118
	MID	28	93	97	101	105	108	115	118	120	124	124	124
	HIGH	32	101	105	109	112	115	119	123	126	128	128	128

Model	Step	CMM	Static Pressure[mmAq(Pa)]										
			5(49)	6(59)	7(69)	8(78)	9(88)	10(98)	11(108)	12(118)	13(127)	14(137)	15(147)
			Setting Value										
			32:01	32:02	32:03	32:04	32:05	32:06	32:07	32:08	32:09	32:10	32:11
ABNW42GM2A0	LOW	28	100	103	106	110	114	118	121	125	128	133	136
	MID	33	108	111	114	118	122	125	128	131	134	138	141
	HIGH	38	117	120	124	127	130	133	135	138	141	144	147

NOTE

1. Be sure to set the value referring table 1. Unexpected set value will cause mal-function.
2. Table 1 is based at 230V. According to the fluctuation of voltage, air flow rate varies.
3. Factory Set(External Static Pressure) each Model

Model	Factory set (E.S.P.) mmAq(Pa)
ABNW18GM1A0	6(59)
ABNW24GM1A0	
ABNW30GM1A0	
ABNW36GM2A0	
ABNW42GM2A0	

* If it is zero static pressure, please set value below Maximum value.

Model	Maximum value
ABNW18GM1A0	115
ABNW24GM1A0	
ABNW30GM1A0	120
ABNW36GM2A0	
ABNW42GM2A0	120

Table 2

Model	Mode		Set value	Standard ESP(mmAq(Pa))	CMM	Lower Limit of External Static Pressure (mmAq(Pa))	Upper Limit of External Static Pressure (mmAq(Pa))
ABNH18GHLA2	High (factory set)	HI	145	8(78)	16.5	2.5(25)	8(78)
		Mid	140		14.5		
		Low	134		13.0		
ABNH24GHLA2	High (factory set)	HI	150	8(78)	18.0	2.5(25)	8(78)
		Mid	145		16.5		
		Low	136		14.0		
ABNH30GGLA2	High (factory set)	HI	137	10(98)	26.5	2.5(25)	10(98)
		Mid	131		23.0		
		Low	126		20.0		
ABNH36GGLA2	High (factory set)	HI	152	10(98)	32.0	4(39)	10 (98)
		Mid	146		29.0		
		Low	141		26.5		
ABNH42GRLA2	High (factory set)	HI	106	10(98)	38.0	5(49)	12(118)
		Mid	102		36.0		
		Low	99		32.0		
ABNH48GRLA2	High (factory set)	HI	110	10(98)	40.0	5(49)	12(118)
		Mid	106		35.0		
		Low	103		30.0		
ABNH60GRLA2	High (factory set)	HI	123	10(98)	50.0	6(59)	14(137)
		Mid	120		45.0		
		Low	115		40.0		

Models: ABNH09GL1A2 [CB09L N12]

(Unit : CMM)

Setting Value	Static Pressure(mmAq(Pa))					
	0 (0)	1 (10)	2 (20)	3 (30)	4 (40)	5 (50)
60	-	-	-	-	-	-
65	5.03	-	-	-	-	-
70	5.60	4.85	-	-	-	-
75	6.19	5.44	4.57	-	-	-
80	6.79	6.05	5.17	-	-	-
85	7.41	6.67	5.80	4.80	-	-
90	8.05	7.31	6.43	5.44	-	-
95	8.71	7.96	7.09	6.09	4.97	-
100	9.38	8.63	7.76	6.76	5.64	-
105	10.07	9.32	8.45	7.45	6.33	5.08
110	-	10.03	9.16	8.16	7.04	5.79
115	-	-	9.88	8.88	7.76	6.51
120	-	-	-	9.62	8.50	7.25
125	-	-	-	10.38	9.26	8.01
130	-	-	-	-	10.03	8.78

Models: ABNH12GL2A2 [CB12L N22] / ABNH18GL2A2 [CB18L N22]

(Unit : CMM)

Setting Value	Static Pressure(mmAq(Pa))					
	0 (0)	1 (10)	2 (20)	3 (30)	4 (40)	5 (50)
75	6.50	-	-	-	-	-
80	7.34	6.70	-	-	-	-
85	8.20	7.55	6.69	-	-	-
90	9.07	8.43	7.56	6.47	-	-
95	9.96	9.32	8.45	7.36	-	-
100	10.87	10.22	9.36	8.27	6.96	-
105	11.79	11.15	10.28	9.19	7.89	6.35
110	12.73	12.09	11.22	10.14	8.83	7.30
115	13.69	13.05	12.18	11.09	9.78	8.25
120	14.67	14.02	13.16	12.07	10.76	9.23
125	15.66	15.01	14.15	13.06	11.75	10.22
130	16.67	16.02	15.16	14.07	12.76	11.23
135	-	-	16.18	15.10	13.79	12.26
140	-	-	-	16.14	14.83	13.30
145	-	-	-	-	15.89	14.36

Models: ABNH24GL3A2 [CB24L N32]

(Unit : CMM)

Setting Value	Static Pressure(mmAq(Pa))					
	0 (0)	1 (10)	2 (20)	3 (30)	4 (40)	5 (50)
85	10.19	-	-	-	-	-
90	12.18	10.71	11.09	-	-	-
95	13.81	12.34	12.19	-	-	-
100	15.16	13.69	13.38	10.71	-	-
105	16.30	14.83	14.36	11.85	-	-
110	17.31	15.85	15.23	12.86	10.97	-
115	18.27	16.80	16.07	13.82	11.93	-
120	19.26	17.79	16.93	14.80	12.91	10.49
125	20.34	18.87	17.89	15.88	13.99	11.57
130	21.60	20.13	19.01	17.14	15.25	12.83
135	-	21.64	20.36	18.66	16.76	14.35
140	-	-	22.01	20.50	18.61	16.19
145	-	-	-	22.75	20.86	18.44

Note :

1. The above table shows the correlation between the air rates and E.S.P.

Table 1**ABNW18GM1A0, ABNW24GM1A0**

(Unit : CMM)

Setting value	Static Pressure (mmAq(Pa))							
	2.5(25)	4(39)	6(59)	8(78)	10(98)	12(118)	14(137)	15(147)
70	11.3							
75	12.8							
80	14.4	11.4						
85	15.9	13.2	10.2					
90	17.5	15.0	12.0					
95	19.0	16.7	13.7	10.7				
100	20.6	18.5	15.5	12.5				
105	22.1	20.3	17.3	14.3	11.1			
110	23.7	22.1	19.0	16.1	13.1	10.0		
115		23.8	20.8	17.9	15.1	12.2		
120			22.6	19.7	17.1	14.3	11.3	
125				21.5	19.1	16.5	13.6	11.9
130				23.3	21.2	18.7	15.8	14.3
135					23.2	20.8	18.0	16.7
140						23.0	20.3	19.1
145							22.5	21.5
150								23.8

ABNW30GM1A0

(Unit : CMM)

Setting value	Static Pressure (mmAq(Pa))							
	2.5(25)	4(39)	6(59)	8(78)	10(98)	12(118)	14(137)	15(147)
85	16.8	14.6						
90	18.1	15.9						
95	19.4	17.2	15.0					
100	20.7	18.5	16.3	13.9				
105	22.0	19.8	17.7	15.3	13.0			
110	23.3	21.1	19.1	16.8	14.6			
115	24.6	22.4	20.5	18.3	16.3	14.2		
120	25.9	23.7	21.8	19.7	17.9	15.9	13.3	
125		25.1	23.2	21.2	19.6	17.5	15.2	14.6
130			24.6	22.7	21.2	19.2	17.1	16.3
135				24.2	22.9	20.9	19.0	18.1
140					24.5	22.6	20.9	19.9

Note :

1. The above table shows the correlation between the air rates and E.S.P.

ABNW36GM2A0

(Unit : CMM)

Setting value	Static Pressure (mmAq(Pa))						
	4(39)	6(59)	8(78)	10(98)	12(118)	14(137)	15(147)
85	24.9						
90	27.6	22.7					
95	30.4	25.7	20.7				
100	33.1	28.7	24.0				
105	35.9	31.7	27.3	20.8			
110	38.6	34.7	30.5	24.3	20.6		
115		37.8	33.8	27.9	23.8		
120			37.1	31.4	27.0	22.4	20.5
125				35.0	30.1	25.7	23.7
128				37.1	32.0	27.6	25.7

ABNW42GM2A0

(Unit : CMM)

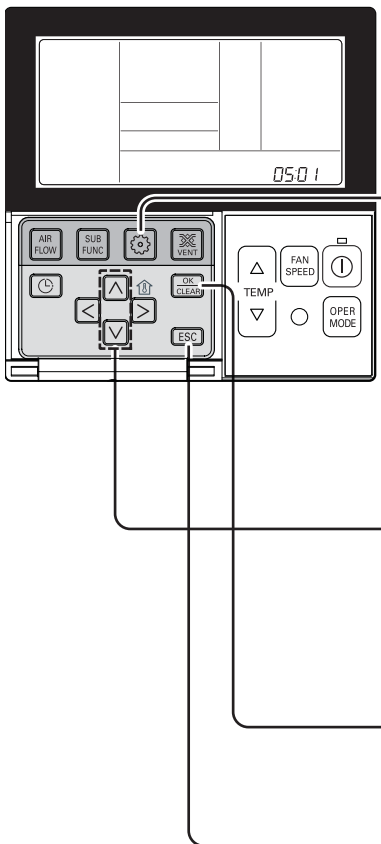
Setting value	Static Pressure (mmAq(Pa))						
	5(49)	6(59)	8(78)	10(98)	12(118)	14(137)	15(147)
90	22.2						
95	25.1	22.3					
100	28.0	25.4					
105	30.9	28.5	23.3				
110	33.8	31.6	26.8				
115	36.7	34.8	30.3	24.4			
120	39.7	37.9	33.8	28.3	23.5		
125	42.6	41.0	37.3	32.2	27.5		
130		44.1	40.8	36.1	31.6	26.1	
135			44.3	40.0	35.6	30.4	28.0
140				43.9	39.7	34.6	32.4
145					43.7	38.9	36.8
150						43.1	41.2
155							45.6



Note :

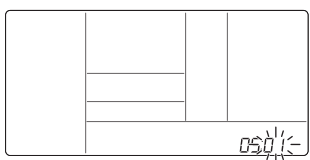


1. The above table shows the correlation between the air rates and E.S.P.

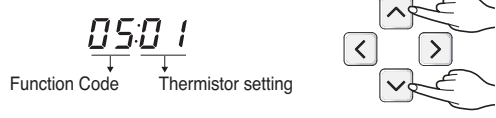

4.2 High Ceiling operation



This function is to adjust FAN Airflow rate according to ceiling height (For ceiling type product)



- 1** If pressing  button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode.
Please press more than 3 seconds for sure.
- 2** If moving to ceiling height selection menu by pressing  button, it indicates as picture below.


- 3** Select ceiling height value by pressing   button. (01:Low, 02:Medium, 03:High, 04:Very high)


- 4** Press  button to save.


- 5** Pressing  button will exit settings mode.
* After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
* When exiting without pressing set button, the manipulated value is not reflected.

<Ceiling Height Selection Table>

Ceiling Height Level		Description
01	Low	Decrease the indoor airflow rate 1 step from standard level
02	Medium	Set the indoor airflow rate as standard level
03	High	Increase indoor airflow rate 1 step from standard level
04	Very high	Increase indoor airflow rate 2 steps from standard level

- Ceiling height setting is available only for some products.
- Ceiling height of 'Very high' function may not exist depending on the indoor unit.
- Refer to the product manual for more details.

5. Reliability

5.1 Hot start

- When heating is started, the indoor fan is stopped or very slow to prevent the cold air carry out
- When the temp. of heat exchanger reach 30°C(model by model), indoor fan is started.

5.2 Self-diagnosis Function

- The air conditioner installed can self-diagnosed its error status and then transmits the result to the central control. Therefore, a rapid countermeasure against failure of the air conditioner allows easy management and increases the usage life of air conditioner.
- Refer to trouble shooting guide.

5.3 Soft dry operation

- When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.

Intake air Temp.	Setting Temp.
26°C ≤ intake air temp.	25°C
24°C ≤ intake air temp. < 26°C	intake air temp. -1°C
22°C ≤ intake air temp. < 24°C	intake air temp. -0.5°C
18°C ≤ intake air temp. < 22°C	intake air temp.
intake air temp. < 18°C	18°C

- While compressor off, the indoor fan repeats low airflow speed and stop.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.

Compressor ON Temp. → Setting Temp+0.5°C
 Compressor OFF Temp. → Setting Temp-0.5°C

- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

6. Convenience Functions & Controls

6.1 Cooling & heating Operations

6.1.1 Cooling Mode

- Operating frequency of compressor depends on the load condition, like the difference between the room temp. and the set temp., frequency restrictions.
- If the compressor operates at some frequency, the operating frequency of compressor cannot be changed within 30 seconds. (not emergency conditions)
- Compressor turned off when
 - intake air temperature is in between $\pm 0.5^{\circ}\text{C}$ of the setting temp. limit for three minutes continuously.
 - intake air temperature reaches below 1.0°C of the temperature of setting temp..
- Compressors three minutes time delay.
 - After compressor off, the compressor can restart minimum 3 minutes later.

6.1.2 Heating Mode

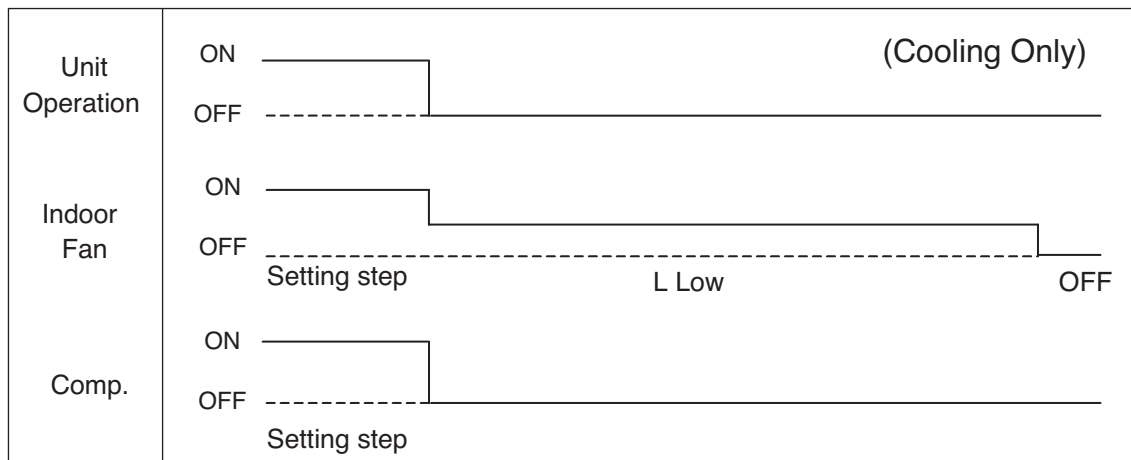
- Operating frequency of compressor depend on the load condition, The difference between the room temp. and set temp., frequency restrictions.
- If compressor operates at some frequency, the operating frequency of compressor cannot be changed within 30 seconds.
- Condition of compressor turned off
 - When intake air temperature reaches $+4^{\circ}\text{C}$ above the setting temperature.
- Condition of compressor turned on
 - When intake air temperature reaches $+2^{\circ}\text{C}$ above the setting temperature.
- * Condition of indoor fan turned off
 - While in compressor on : indoor pipe temp. $< 20^{\circ}\text{C}$
 - While in compressor off : indoor pipe temp. $< 30^{\circ}\text{C}$
- While in defrost control, between the indoor and outdoor fans are turned off.
- Compressor 2minutes delay
 - After compressor off, the compressor can restart minimum 2 minutes later.

NOTE: Some Models are different by temperature of thermo ON/OFF.

CST/Duct/CVT type indoor unit matched with Universal Outdoor unit	CST/ Duct/CVT type indoor unit matched with Single Outdoor unit/Multi Outdoor unit/Multi V Outdoor unit
Thermo ON : $+2^{\circ}\text{C}$ above setting temp. Thermo OFF : $+4^{\circ}\text{C}$ above setting temp.	Thermo ON : Setting temp. Thermo OFF : $+3^{\circ}\text{C}$ above setting temp.

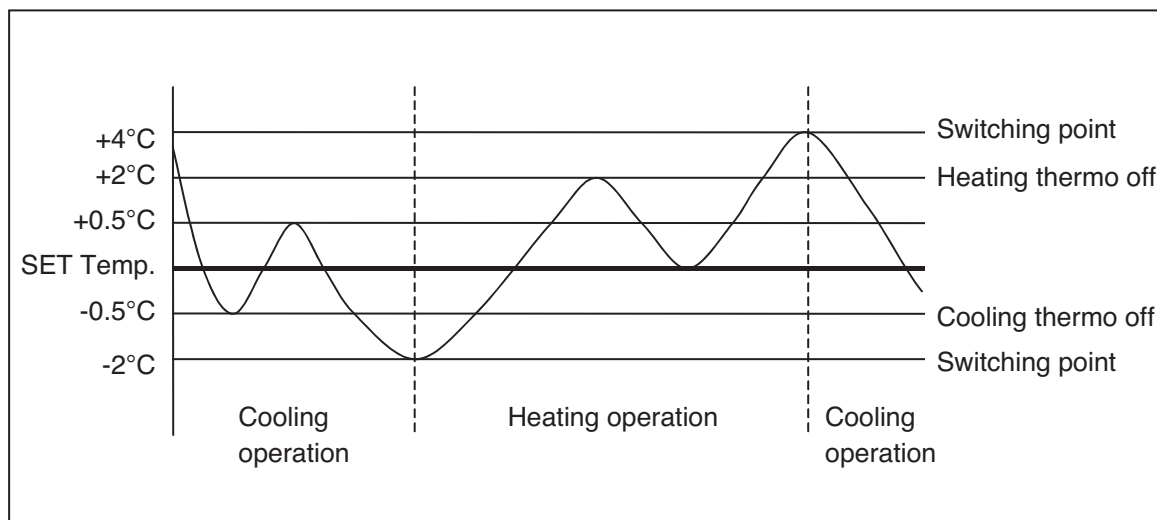
6.2 Auto cleaning operation

- Function used to perform Self Cleaning to prevent the Unit from Fungus and bad odor.
- Used after the Cooling Operation before turning the unit off, clean the Evaporator and keep it dry for the next operation.
- The function is easy to operate as it is accessed through the Remote controller.



6.3 Auto changeover operation

- The air conditioner changes the operation mode automatically to keep indoor temperature.
- When room temperature vary over $\pm 2^{\circ}\text{C}$ with respect to setting temperature, air conditioner keeps the room temperature in $\pm 2^{\circ}\text{C}$ with respect to setting temperature by auto change mode.

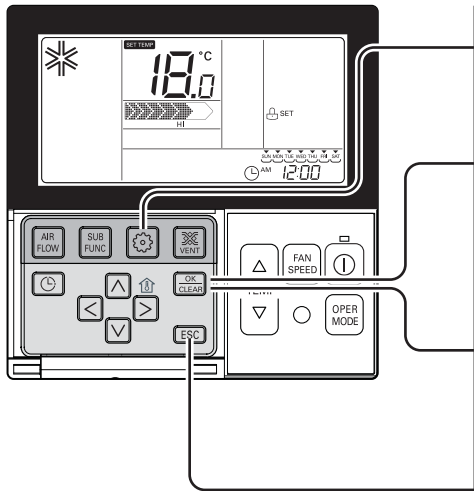













6.4 Auto restart Operation

- Whenever there is electricity failure to the unit, and after resumption of the power, unit will start in the same mode prior to the power failure. Memorized condition are on / off condition, operating mode (cooling/ heating), set temperature and fan speed. The unit will memorize the above conditions and start with same memorized condition.

6.5 Child Lock Function

It is the function to use preventing children or others from careless using.



- 1 Press  button repeatedly until the  is flashing. 
- 2 If moving to 'setup' icon area by using   button, 'setup' icon blinks, and child lock function is setup if pressing  button at that time. 
- 3 When cancelling lock function, if moving to 'cancel' icon by pressing   button and then, pressing  button, child lock function is cancelled.
- 4 Press  button to exit.
 * After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
 * When exiting without pressing set button, the manipulated value is not reflected.

6.6 Forced operation

- To operate the appliance by force in case when the remote control is lost, the forced operation selection switch is on the main unit of the appliance, and operate the appliance in the standard conditions.
- The operating condition is set according to the outdoor temp. and intake air temperature as follows.

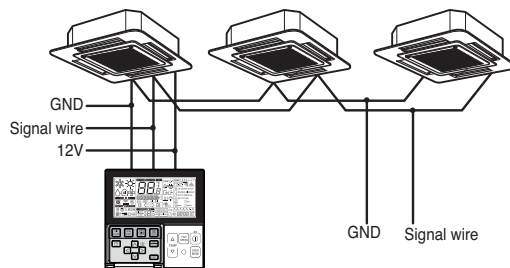
Indoor temp.	Operating Mode	Setting temp.	Setting speed of indoor fan
over 24°C	Cooling	22°C	High speed
21~24°C	Healthy Dehumidification	23°C	
below 21°C	Heating	24°C	

- The unit select the last operation mode in 3 hours.
- Operating procedures when the remote control can't be used is as follows :
 - The operation will be started if the ON/OFF button is pressed.
 - If you want to stop operation, re-press the button.

6.7 Group Control

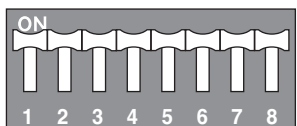
1. When installing more than 2 units of air conditioner to one wired remote controller, please connect as the right figure.

- If it is not event communication indoor unit, set the unit as slave.
- Check for event communication through the product manual.

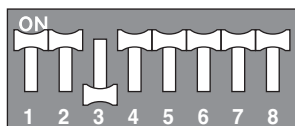


When controlling multiple indoor units with event communication function with one remote controller, you must change the master/slave setting from the indoor unit.

- Indoor units, the master/slave configuration of the product after completion of indoor unit power 'OFF' and then 'ON' the power after 1 minutes elapsed sign up.
- For ceiling type cassette and duct product group, change the switch setting of the indoor PCB.



#3 switch OFF: Master
(Factory default setting)



#3 switch ON: Slave

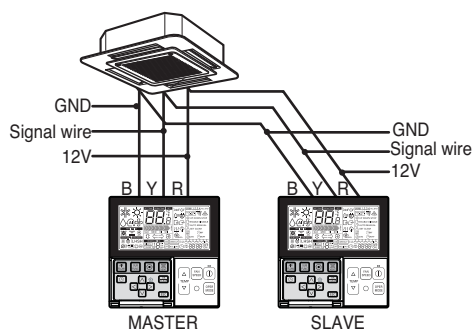
- For wall-mount type and stand type product, change the master/slave setting with the wireless remote controller. (Refer to wireless remote controller manual for detail)

※ When installing 2 remote controllers to one indoor unit with event communication function, set the master/slave of the remote controller. (Refer to remote controller master/slave selection)

When controlling the group, some functions excluding basic operation setting, fan level Min/Mid/Max, remote controller lock setting and time setting may be limited.

2. When installing more than 2 wired remote controllers to one air conditioner, please connect as the right picture.

- When installing more than 2 units of wired remote controller to one air conditioner, set one wired remote controller as master and the others all as slaves, as shown in the right picture.
- You cannot control the group as shown in the right for some products.
- Refer to the product manual for more detail.



<When simultaneously connecting 2 sets of wired remote controller>

- When controlling in groups, set the master/slaver of the remote controller. Refer to Installer setting section on how to set master/slave for more detail.

6.8 Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

6.9 Timer(On/Off)

6.9.1 On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.
While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

6.9.2 Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

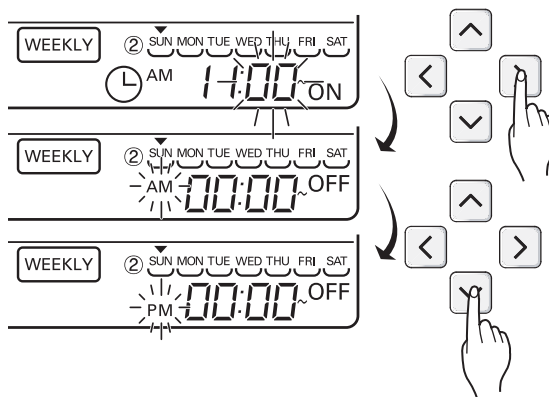
6.10 Weekly Program

You can set the daily reservation in weekly unit.

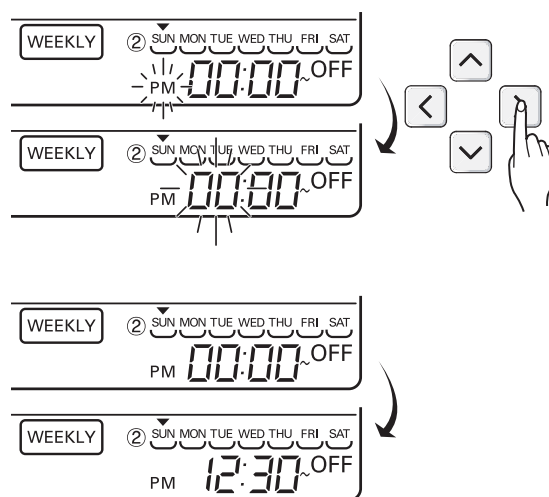
Weekly reservation keeps operating until before you cancel it once you setup

<p>1 Please move to reservation setup mode by pressing reservation button. * You can setup two weekly reservations for one day, and up to fourteen reservations for a week. For example, to setup (Tuesday morning 11:30 turned on ~ afternoon 12:30 turned off), you setup in order below.</p>	
<p>2 Please move to 'weekly' by repeatedly pressing reservation button. 'Weekly' blinks at this time.</p>	
<p>3 Please select weekly reservation or weekly reservation i by using button. * You can setup two reservations, weekly reservation 1 and weekly reservation 2, for a day.</p>	
<p>4 Please move to 'date' setup part by using button. If 'date' indication blinks, please setup date. You can setup date from Monday to Sunday.</p>	
<p>5 Please move to 'AM/PM' setup part of turning on by using button.</p>	
<p>6 Please move to 'hour' setup part of turning on by using button. - It is the part to setup the time at which air-conditioner is turned on.</p>	
<p>7 Please change time by using button. - You can setup hour 0~12.</p>	
<p>8 Please move to 'minute' setup part of turning on by using button.</p>	
<p>9 If 'minute' indication blinks, please setup 'minute' by using button</p>	

10 Please move to 'AM/PM' setup part of turning off by using button.
 - AM/PM setup is identical with turning on time setup.



11 Please move to 'hour' setup part of turning off by using Right button.
 - It is the part to reserve the time at which air-conditioner is turned off.
 - If 'hour' indication blinks, please setup 'hour'.

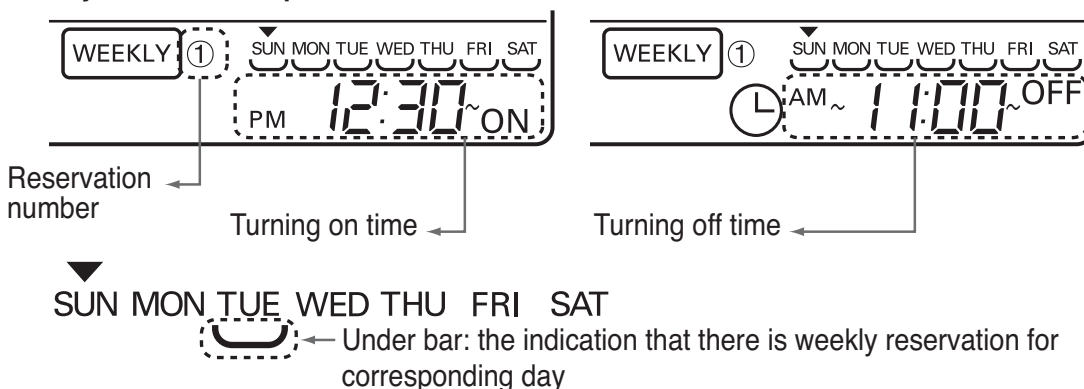


* Please setup 'hour' and 'minute' identically with the method to setup turning on time.

12 If finishing weekly reservation setup, please press setup/cancellation button. Weekly reservation setup for the day that you set is finished.

13 If you setup with the method identical with above by selecting the day that you'd like to setup, it operates weekly reservation.
 If you setup both turning on reservation time and turning off reservation time identically, it doesn't operate reservation drive.

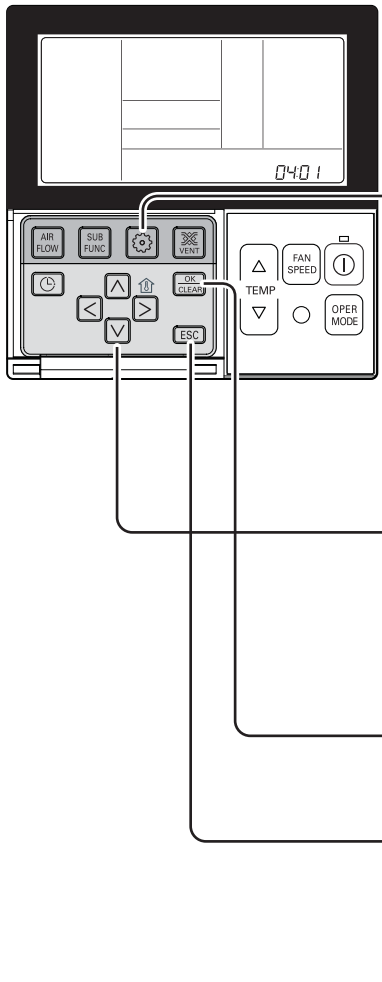
Weekly reservation explanation






* Indoor unit is turned on to desired temperature if it is configured using up/down button during preset of weekly operation time.
 (Temperature selection range : 18°C~30°C)
 - When desired temperature is not set, it is turned on automatically with desired temperature of previous operation.

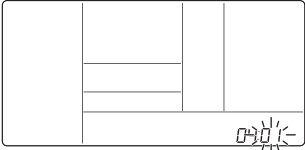


6.11 Two Thermistor Control


This is the function to select the temperature sensor to judge the room temperature.

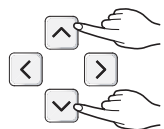




- 1** If pressing  button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode.
Please press more than 3 seconds for sure.




- 2** If moving to room temperature perception sensor selection menu by pressing  button, it indicates as picture below.


- 3** Set Thermistor value by pressing   button. (01: Remote Controller, 02: Indoor, 03: 2TH)


 Function Code Thermistor setting


- 4** Press  button to save.




- 5** Pressing  button will exit settings mode.
* After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
* When exiting without pressing set button, the manipulated value is not reflected.

<Thermistor Table>

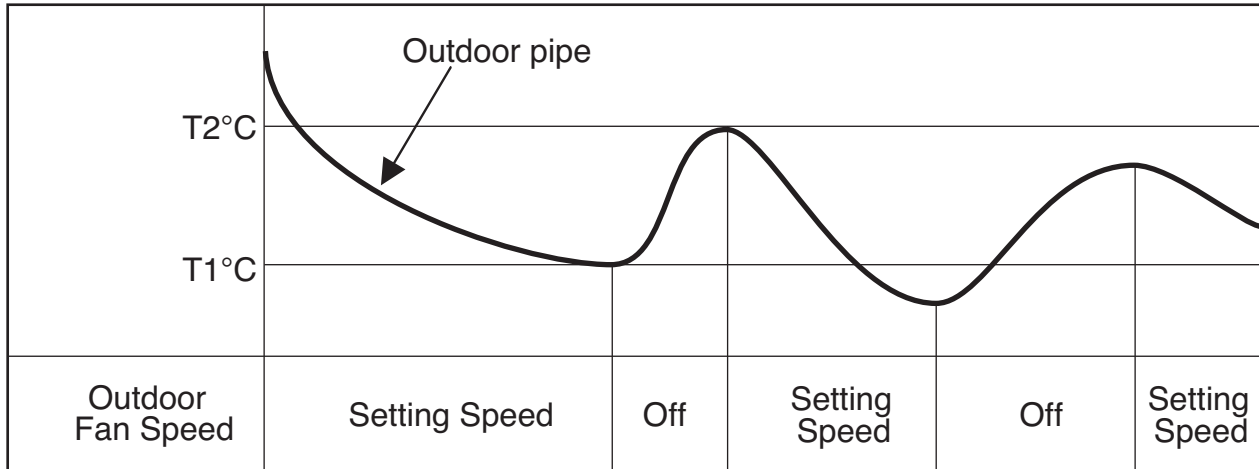
Temperature sensor selection		Function
01	Remote controller	Operation in remote controller temperature sensor
02	Indoor unit	Operation in indoor unit temperature sensor
03	2TH	Cooling Operation of higher temperature by comparing indoor unit's and wired remote controller's temperature. (There are products that operate at a lower temperature.)
		Heating Operation of lower temperature by comparing indoor unit's and wired remote controller's temperature.

* The function of 2TH has different operation characteristics according to the product.

7. Special Function & KIT

7.1 Low Ambient control

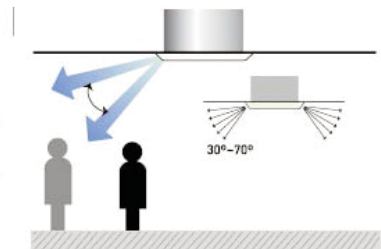
- This Function is for cooling operating in outdoor low temperature .
- If outdoor temperature drops below certain temperature, liquid back is prevented by reducing outdoor fan speed.
- It can prevent frosting of evaporator and keep cooling operation



7.2 Space control

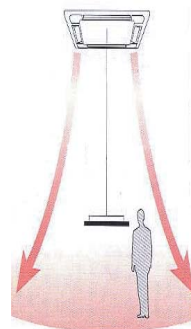
Vanes angle can be controlled by pair, considering its installation environment.

- For example direct drafts can be annoying, leading to discomfort and reduced productivity vane control helps to eliminate this problem.
- Easily controlled by wired remote control.
- Air Flow can be controlled easily regarding any space environment.

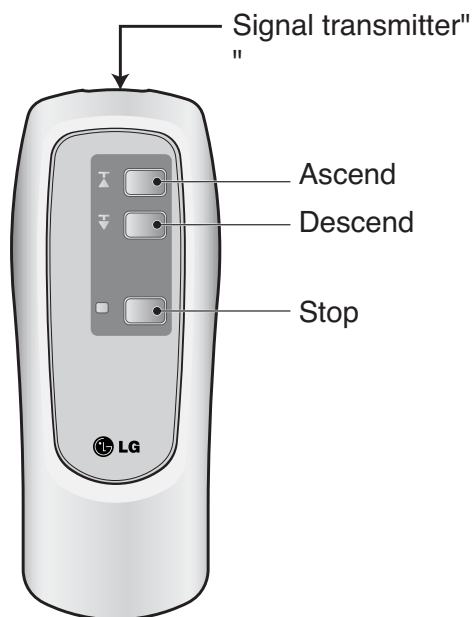


7.3 Auto Elevation Grille

- Auto Elevation Grille is automatically down to height of max. 3.1 m. So it enables to install the Indoor unit at high ceiling space. And Auto Elevation Grille makes you cleaning the filter easily.



■ ELEVATION GRILL (REMOTE CONTROLLER_Accessory)



• Main Components of Lift Grill

- ① Lift grill front panel assembly
- ② Bolts for installation (4 EA, P/No. 3A00255K)
- ③ Instruction manual
- ④ Remote Controller for lift grill

• How to Use Remote Controller

As for operation of Remote Controller, use it by directing the transmitter part of Remote Controller to the receiver part of front panel directly under front panel.

- Do not drop it down or into water. Or else there is worry about trouble failure.
- Do not press hard the Remote Controller button with nail (ball-point pen or other sharp substance). Or else there is worry about trouble failure.
- In case when obstacle such as curtain hides the signal reception part of receiver in between the space interval, Remote Controller operation is infeasible.

• How to Operate the Lift Grill

⚠ CAUTION

- Always stop the air conditioner operation for safety before operating lift grill.
- Take heed _ there is worry about dust fall etc. when suction grill descends.
- In case when the set automatic stop distance goes wrong, check the set value of operation panel and confirm if there is neither obstacle nor mankind.
- When you are not to remove obstacle, stop the operation before touching the obstacle.

1. Stop the Air Conditioner Operation

Automatic Stop Distance of Grill

2. Descend the Suction Grill

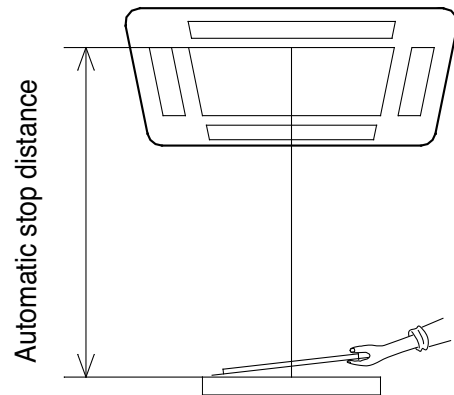
- Depress the down button(▼).
Then suction grill descends and stops automatically at a certain distance.
- You may stop it at wanted distance point by depressing the stop button (■) when descending.

3. Raise the Suction Grill

- Depress the up button(▲).
Then suction grill goes up and enters into the front panel.

4. Stop the Suction Grill during Rising

- Depress the stop button(■).
Make use of this when you want to stop it at your wished position.



Ceiling height	Low	Medium (Height: 3~4 m)	High
Automatic stop distance	1.5±0.5 m	2.5±0.5 m	3.5±0.5 m

* If you want to change automatic distance setting, consult with your sale agency.

3. Basic Control

1. Normal operation.....	54
2 Compressor control	54
3. EEV(Electronic Expansion Valve) control	54

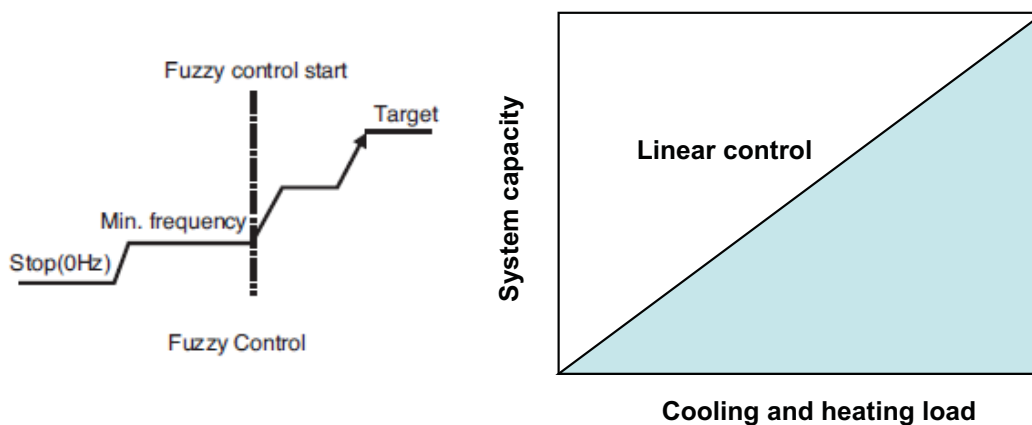
1. Normal operation

Basic principle is to control the rpm of the motor by changing the working frequency of the compressor. Three phase voltage is supplied to the motor and the time for which the voltage will supplied is controlled by IPM (intelligent power module). Switching speed of IPM defines the variable frequency input to the motor.

Actuator	Cooling operation	Heating operation	Stop state
Compressor	Fuzzy control	Fuzzy control	Stop
Fan	Fuzzy control	Fuzzy control	Stop
EEV	Super heating fuzzy control	Discharge Temp. Control	Min. Pulse

2. Compressor control

Fuzzy control : Maintain evaporating temperature (Te) to be constant on cooling mode and constant condensing temperature (Tc) on heating mode by fuzzy control to ensure the stable system performance.



Inverter linear control as cooling and heating load increasing

3. EEV(Electronic Expansion Valve) control

EEV operates with fuzzy control rules to keep The degree of superheat (2~3°C) or the target temperature of discharge pipe.

* Cooling mode
 The degree of superheat = $T_{suction} - T_{evaporator}$
 $T_{suction}$: temperature at suction pipe sensor(°C)
 $T_{evaporator}$: evaporation temperature (°C)

* Heating mode
 the target temperature of discharge pipe = $T_{condenser} + \alpha$
 $T_{condenser}$: condenser temperature (°C)

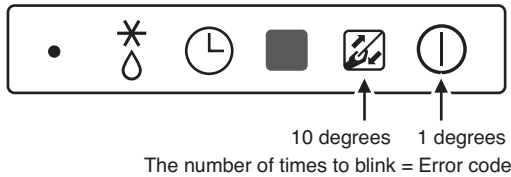
4. Trouble Shooting

1. Self-diagnosis Function	56
1.1 Error Indicator (Indoor).....	56
1.2 Error Indicator (Outdoor).....	57
2. Pump Down	58
3. Evacuation	59
4. Gas Charging	60
5. Cycle Part	61
6. Electronic Parts	62
6.1 The Product doesn't operate at all	62
6.2 The Product doesn't operate with the remote controller	63
6.3 The Compressor/Outdoor Fan are don't operate	64
6.4 When indoor Fan does not operate.....	65
6.5 When the louver does not operate.....	66
6.6 Troubleshooting Indoor Error	67
6.7 Troubleshooting Outdoor Error	73

1. Self-diagnosis Function

1.1 Error Indicator (Indoor)

Ceiling Cassette Type Display



Error Indicator

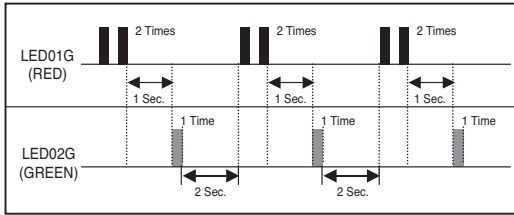
- The function is to self-diagnosis airconditioner and express the troubles identifiably if there is any trouble.
- Error mark is ON/OFF for the operation LED of evaporator body in the same manner as the following table.
- If more than two troubles occur simultaneously, primarily the highest trouble fo error code is expressed.
- After error occurrence, if error is released, error LED is also released simultaneously.
- To operate again on the occurrence of error code, be sure to turn off the power and then turn on.
- Having or not of error code is different from Model.

Indoor Error

Code	Title	Cause of Error
1	Air temperature sensor of Indoor unit	Air temperature sensor of indoor unit is open or short
2	Inlet pipe temperature Sensor of indoor unit	Inlet pipe temperature sensor of indoor unit is open or short
3	Communication error : wired remote controller ↔ indoor unit	Failing to receive wired remote controller signal in indoor unit PCB
4	Drain pump	Malfunction of drain pump
5	Communication error : outdoor unit ↔ indoor unit	Failing to receive outdoor unit signal in indoor unit PCB
6	Outlet pipe temperature sensor of indoor unit	Outlet pipe temperature sensor of indoor unit is open or short
9	Indoor EEPROM Error	In case when the serial number marked on EEPROM of Indoor unit is 0 or FFFFFFFF
10	Abnormal fan motor operation	Disconnecting the fan motor connector/ Failure of indoor fan motor lock

4. Trouble Shooting

1.2 Error Indicator (Outdoor)



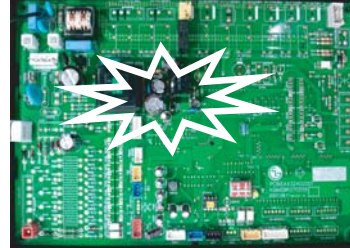
Outdoor Error
Ex) Error 21 (DC Peak)



UU18W/24W/30W



UU36W/42W/48W/60W



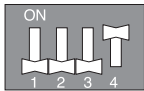
UU37W/43W/49W/61W

Code	Contents	Operation State	Error Display			Count
			Cable Remote Controller	Outdoor Device		
				Red LED	Green LED	
21	IPM Fault Error	Stop	CH21	Flashing 2 times	Flashing 1 time	10 time Within 1h
22	CT 2 Error (Input of Over-Current)	Stop	CH22	Flashing 2 times	Flashing 2 times	Infinite restart
23	DC Link Error (High/Low DC Voltage)	Stop	CH23	Flashing 2 times	Flashing 3 times	Infinite restart
24	Pressure Switch High/Low Pressure Fault	Stop	CH24	Flashing 2 times	Flashing 4 times	Infinite restart
25	Input Frequency Detection Failure	Stop	CH25	Flashing 2 times	Flashing 5 times	1 time Within 1h
26	DC Comp Position Detection Error	Stop	CH26	Flashing 2 times	Flashing 6 times	1 time Within 1h
27	PSC/PFC Over-Current Error (HW)	Stop	CH27	Flashing 2 times	Flashing 7 times	10 time Within 1h
29	Comp Phase Over-Current Error	Stop	CH29	Flashing 2 times	Flashing 9 times	10 time Within 1h
32	D-Pipe Overheating Error (INV Comp)	Stop	CH32	Flashing 2 times	Flashing 2 times	Infinite restart
33	D-Pipe Overheating Error (Constant-rate Comp)	Stop	CH33	Flashing 3 times	Flashing 3 times	Infinite restart
41	D-Pipe Sensor Error (INV Comp)	Stop	CH41	Flashing 4 times	Flashing 1 time	1 time Within 1h
43	High pressure Sensor Error	Stop	CH43	Flashing 4 times	Flashing 3 times	1 time Within 1h
44	Outdoor Inlet Sensor Error	Stop	CH44	Flashing 4 times	Flashing 4 times	1 time Within 1h
45	Cond. Pipe Sensor Error	Stop	CH45	Flashing 4 times	Flashing 5 times	1 time Within 1h
46	Suction Pipe Sensor Error	Stop	CH46	Flashing 4 times	Flashing 6 times	1 time Within 1h
47	D-Pipe Sensor Error (Constant-rate Comp)	Stop	CH47	Flashing 4 times	Flashing 7 times	1 time Within 1h
51	Over-Capacity Connection Error	Stop	CH51	Flashing 5 times	Flashing 1 time	1 time Within 1h
53	Communication Error between Outdoor Device Indoor Device	Stop	CH53	Flashing 5 times	Flashing 3 times	1 time Within 1h
54	Open and Reverse Phase Error	Stop	CH54	Flashing 5 times	Flashing 4 times	10 time Within 1h
60	EEPROM Check Sum Error	Stop	CH60	Flashing 6 times	-	1 time Within 1h
61	Outdoor Device Pipe Overheating Error	Stop	CH61	Flashing 6 times	Flashing 1 time	Infinite restart
62	Heat-sink Overheating Error	Stop	CH62	Flashing 6 times	Flashing 2 times	Infinite restart
65	Heat-sink Sensor Error	Stop	CH65	Flashing 6 times	Flashing 5 times	1 time Within 1h
67	Outdoor BLDC Fan Lock Error	Stop	CH67	Flashing 6 times	Flashing 7 times	10 time Within 1h
73	PSC/PFC Over-Current Error (SW)	Stop	CH73	Flashing 7 times	Flashing 3 times	10 time Within 1h

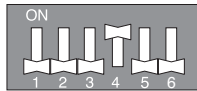
2. Pump Down

Setting Procedure

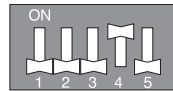
1) Set the Dip Switch as follow after shutting the power source down.



UU18W
UU24W
UU30W



UU36W
UU42W
UU48W
UU60W



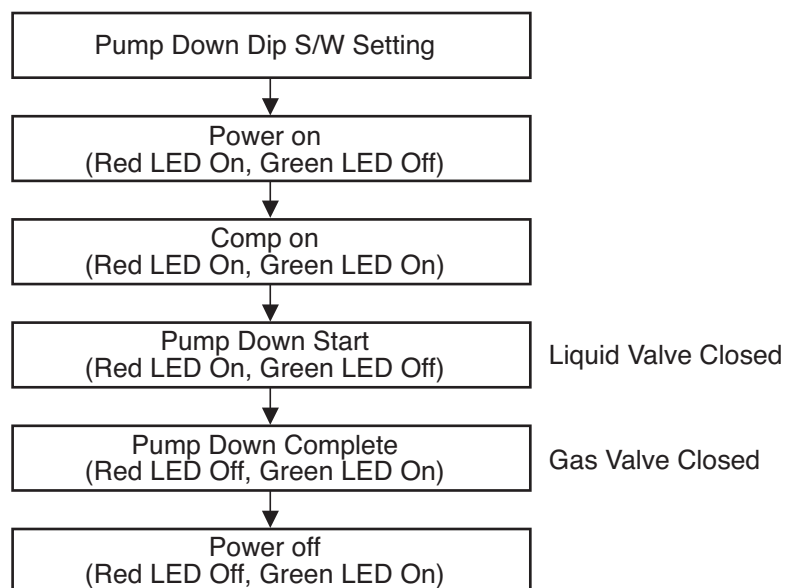
UU37W
UU43W
UU49W
UU61W

- 2) Reset the power.
- 3) Red LED and Green LED of PCB lights during work.
(The indoor unit is operated by force.)
- 4) If operation is done, Red LED will be turned off.
If operation is not done normally, Red LED will blink.
- 5) Close the Liquid valve only after green LED turned off (7 minutes from the start of the machine).
Then close the gas valve after Green LED on.

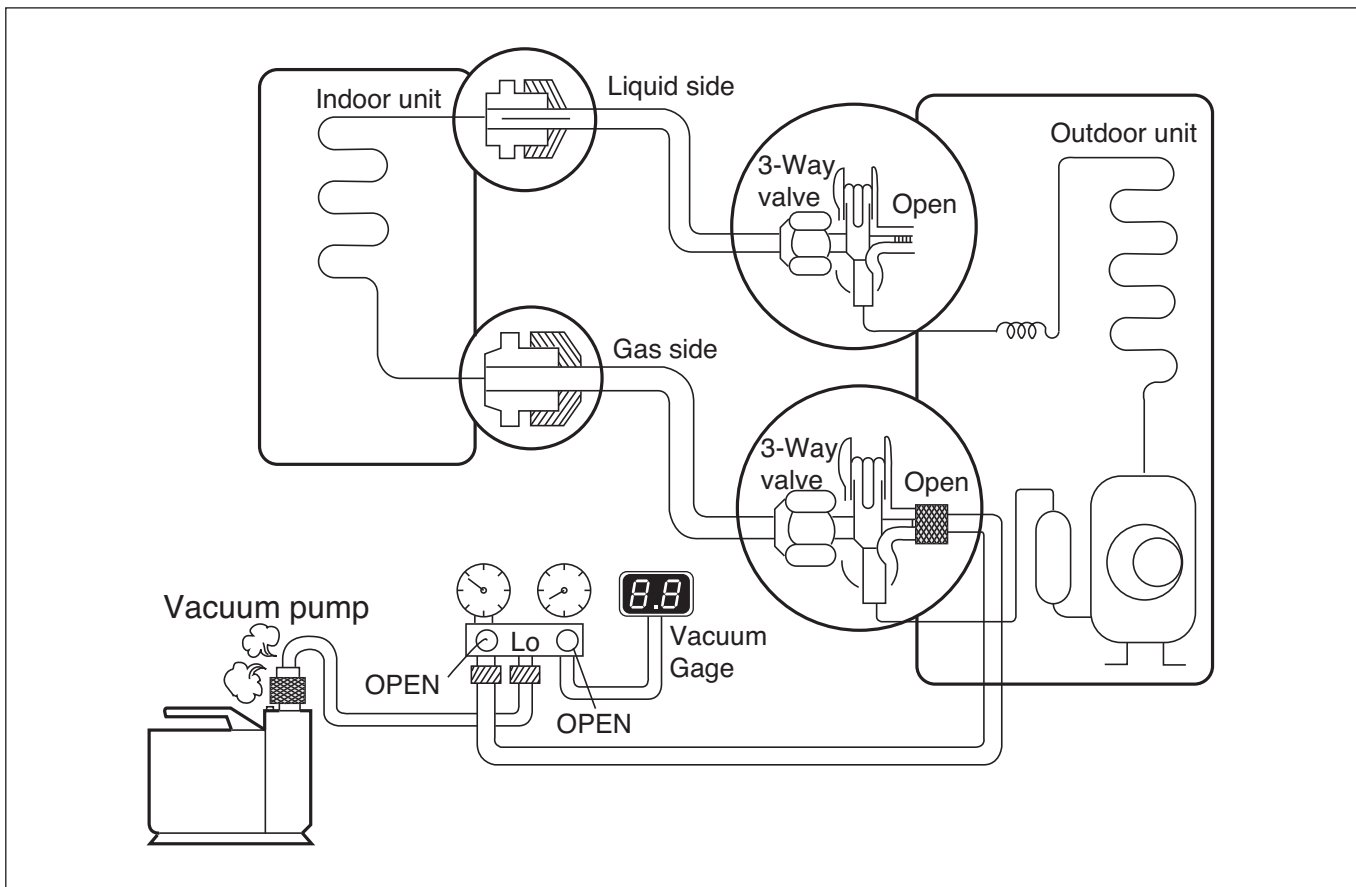


WARNING:

- When the green LED of PCB is on, compressor is going to be off because of low pressure.
- You should return the Dip Switch to operate normally after finishing the operation.
- Improper Pump down will lead to product turn off along with LED (green & red) off with in 20 minutes from the initial start.



3. Evacuation (All amount of refrigerant leaked)



• Procedure

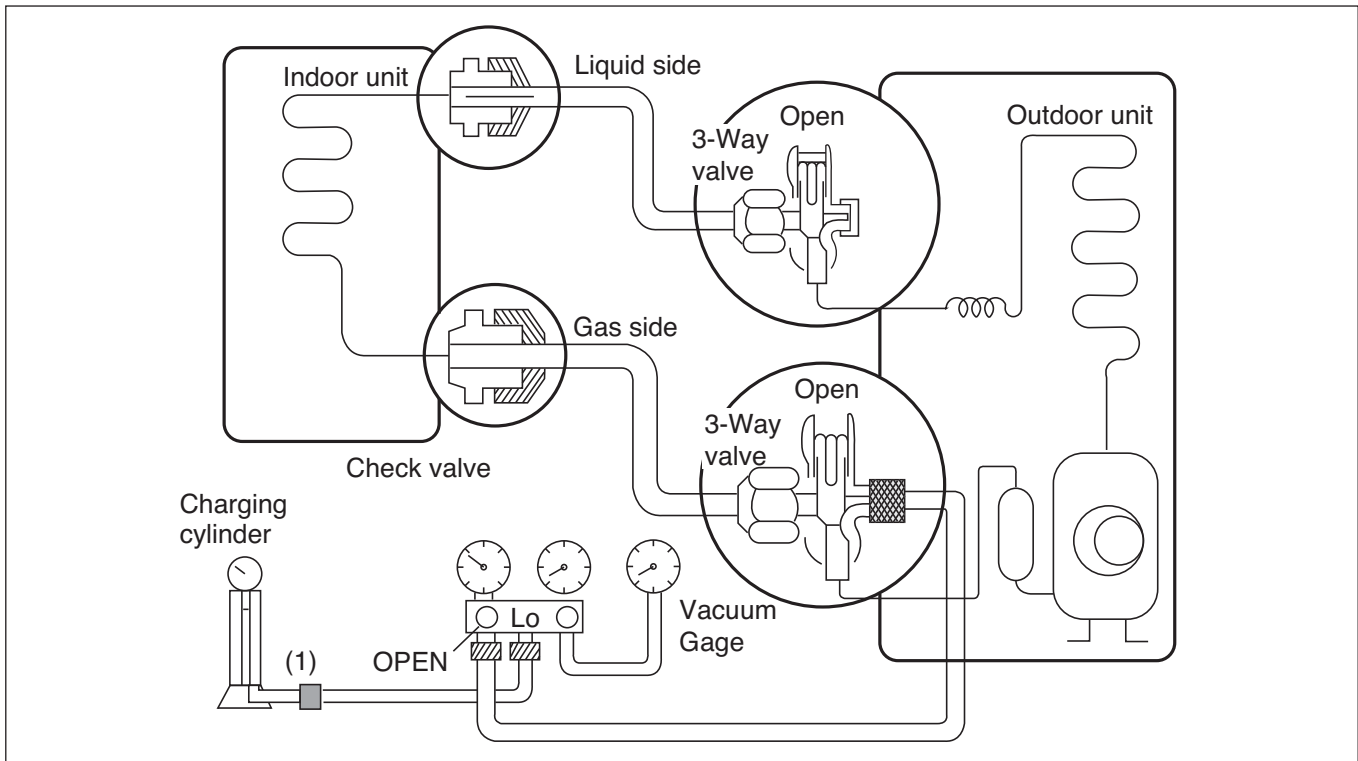
- (1) Connect the vacuum pump to the center hose of charge set center hose
- (2) Evacuation for approximately one hour.
 - Confirm that the gauge needle has moved toward 0.8Torr.
- (3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- (4) Disconnect the charge hose from the vacuum pump.
 - Vacuum pump oil. If the vacuum pump oil becomes dirty or depleted, replenish as needed.

! WARNING

Use a vacuum pump or Inert (nitrogen) gas when doing leakage test or air purge. Do not compress air or Oxygen and do not use Flammable gases. Otherwise, it may cause fire or explosion.

- Otherwise, it may cause personal injury.

4. Gas Charging (After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.

- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures.

Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

WARNING

When installing or relocation the unit, make sure that no substance other than the specified refrigerant(R410A) enter the refrigerant circuit.

- Any presence of foreign substance such as air can cause an abnormal pressure rise and may result in explosion or injury.

5. Cycle Part

Trouble analysis

1. Check temperature difference between intake and discharge air, and check for the operating current too.

Case	Symptom	Supposed Caused
Case 1	Temp. difference : approx. 0°C Current : less than 80% of rated current	All amount of refrigerant leaked out. Check refrigeration cycle.
Case 2	Temp. difference : approx. 8°C Current : less than 80% of rated current	Refrigerant leakage Clog of refrigeration cycle Defective Compressor.
Case 3	Temp. difference : less than 8°C Current : over the rated current	Excessive amount of refrigerant
Case 4	Temp. difference : over 8°C	Normal

N&TICE

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle in cooling mode.

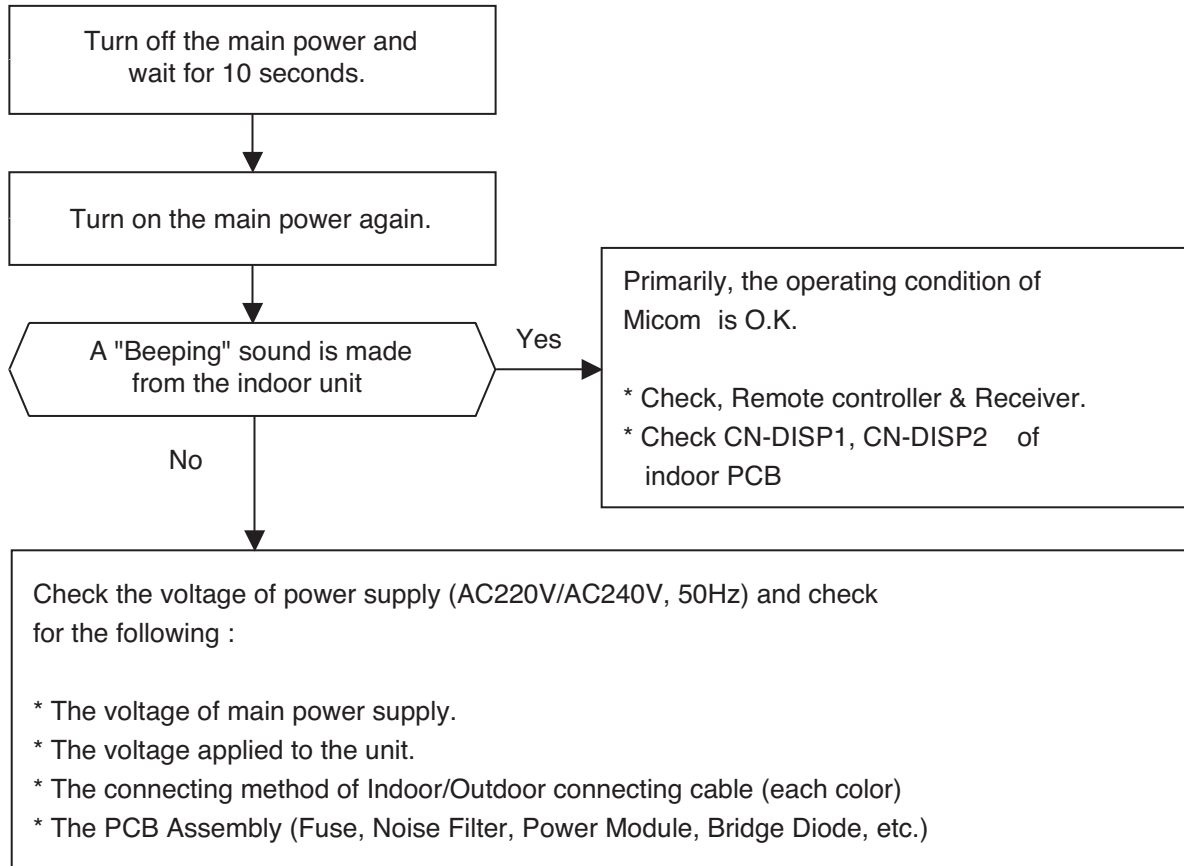
Suction pressure (Compared with the normal value)	Temperature of Discharge Air (Compared with the normal valve)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant (Leakage) Clogging	Current is low.

N&TICE

1. The suction pressure is usually 8.5~9.5kg/cm²G(Cooling) at normal condition.(R410A)
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

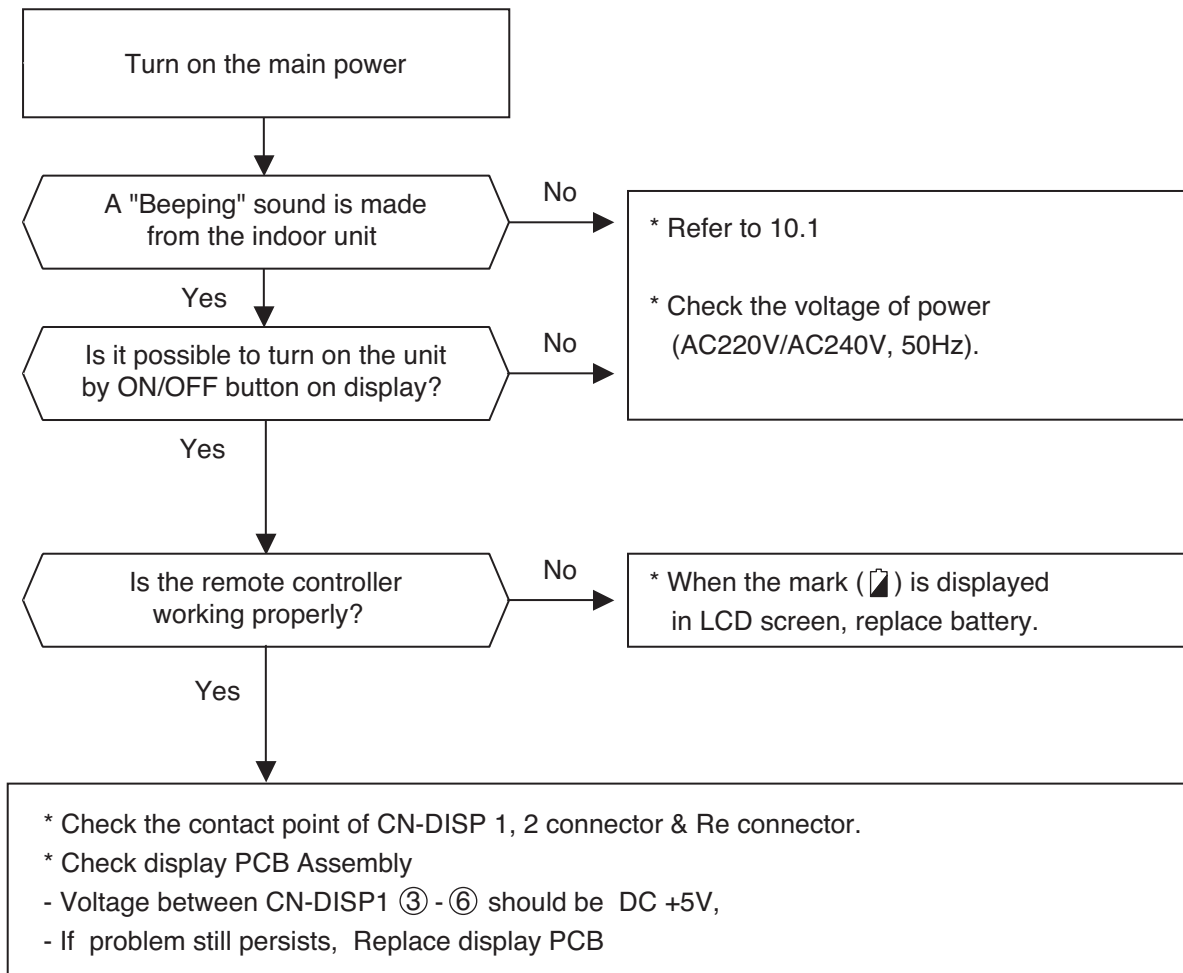
6. Electronic Parts

6.1 The Product doesn't operate at all

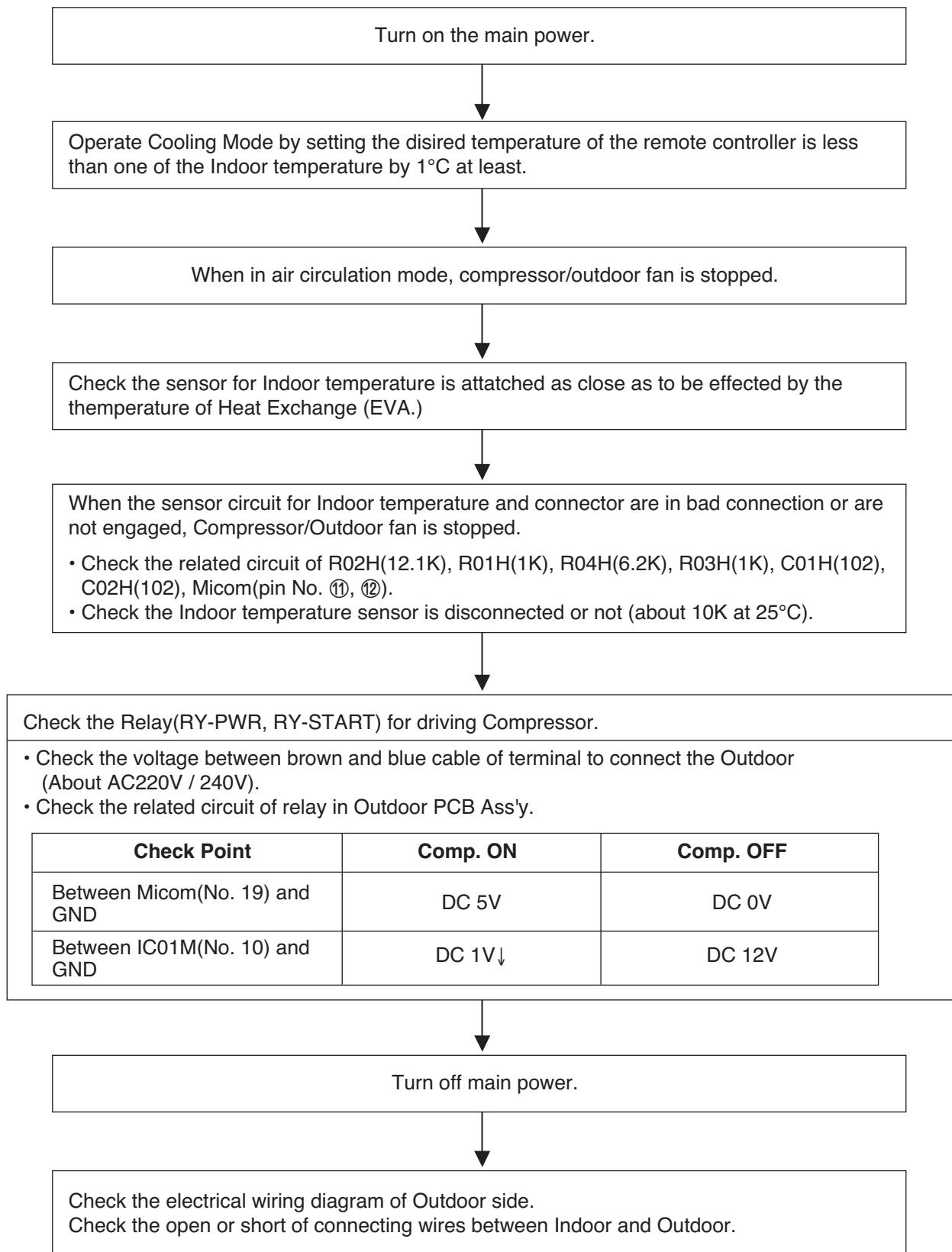


The operation check of the Indoor PCB Assembly		
Procedure	Specification	Remedy
1) The input voltage of power module.	1) AC230V \pm 30V : Check the rated voltage	1) Check the power outlet.
2) The output voltage of power module.	2) 12V \pm 3V	2) Replace PCB Assembly
4) IC04D(7805)	4) DC5V	4) Replace PCB Assembly
5) IC01A(KIA7036)	5) The voltage of micom pin 19 : DC4.5V \uparrow	5) Replace PCB Assembly

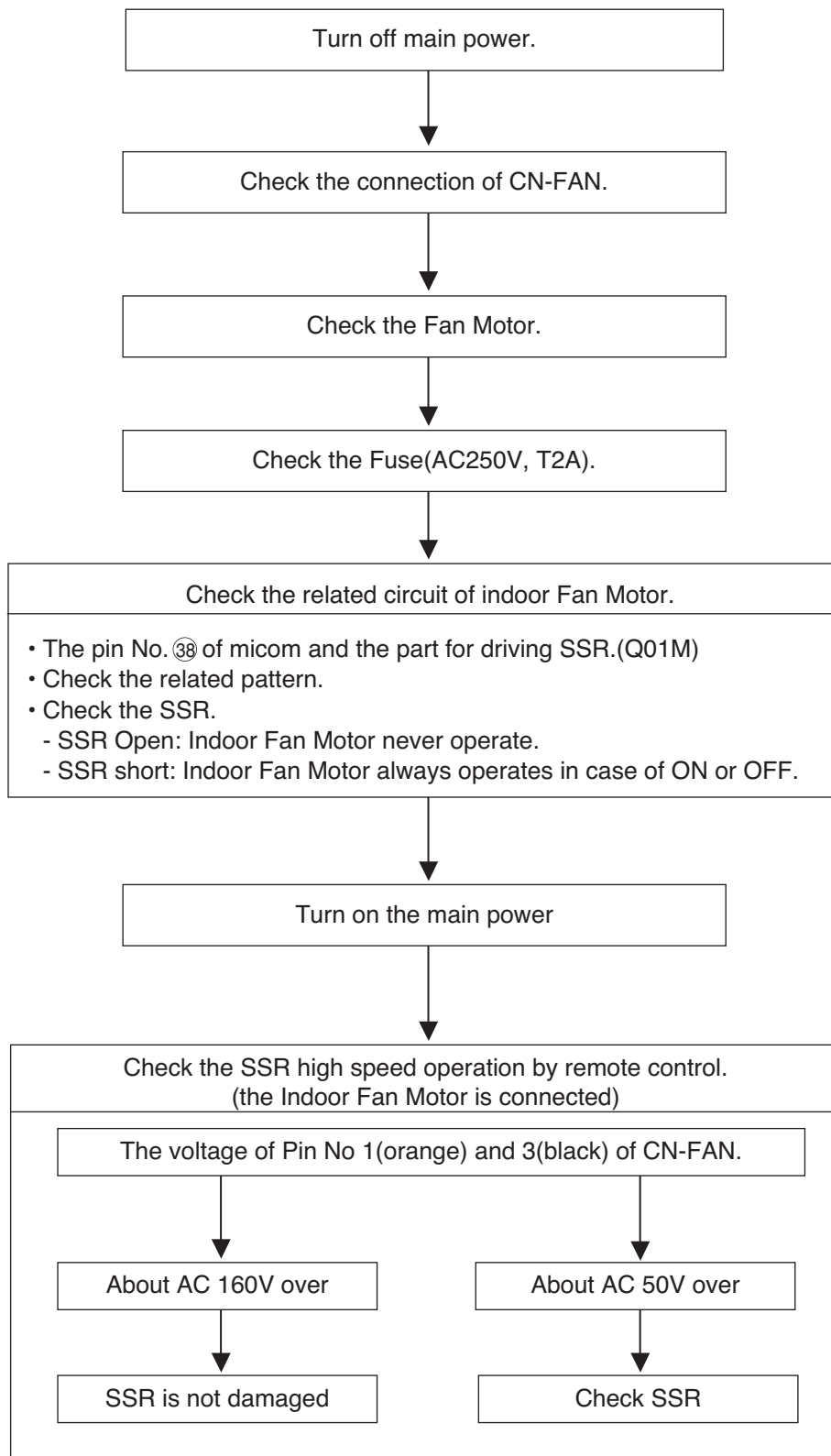
6.2 The Product doesn't operate with the remote controller



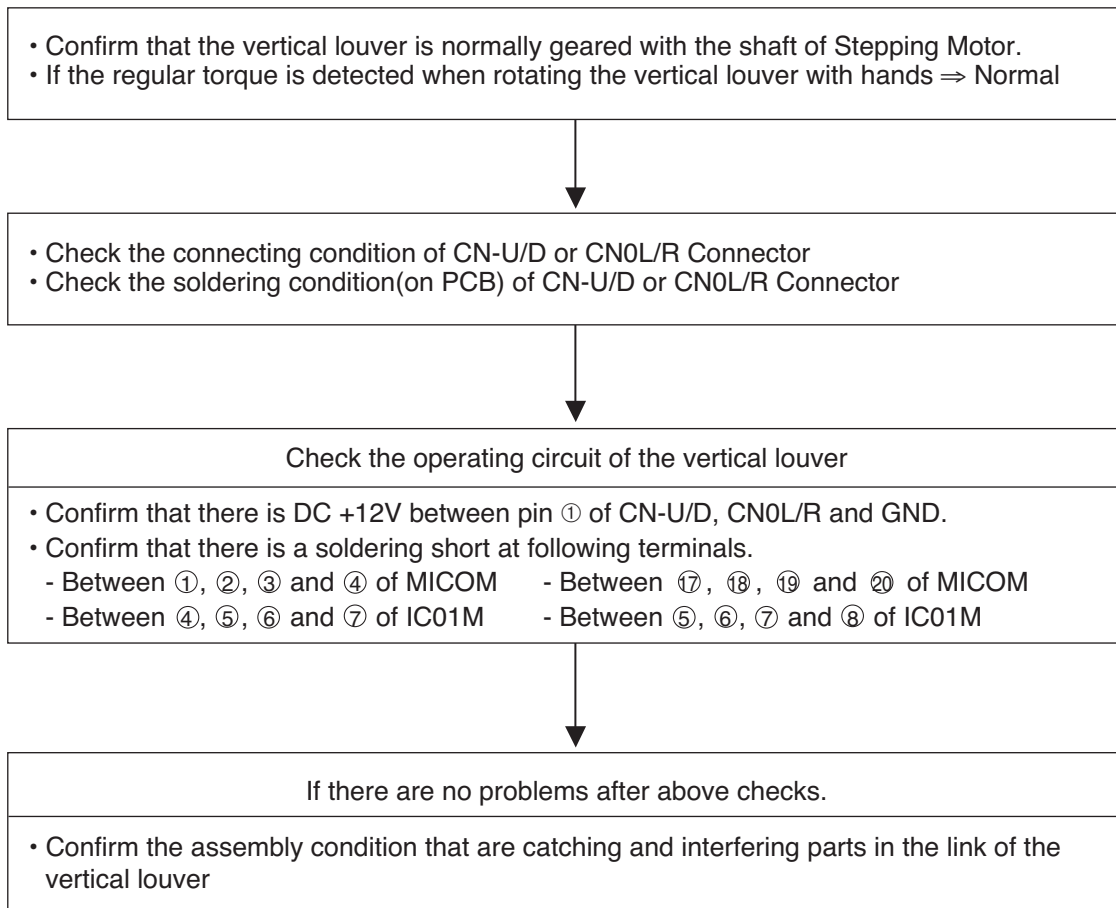
6.3 The Compressor/Outdoor Fan are don't operate



6.4 When indoor Fan does not operate.



6.5 When the louver does not operate.



6.6 Troubleshooting Indoor Error

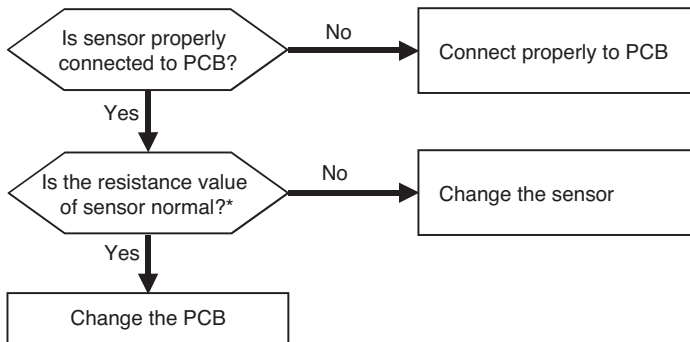
CH 01 (Indoor unit air sensor error)

CH 02 (Indoor unit pipe inlet sensor error)

CH 06 (Indoor unit pipe outlet sensor error)

Error No.	Error Type	Error Point	Main Reasons
01	Indoor unit air sensor error	Indoor unit sensor is open/ short	1. Indoor unit PCB wrong connection 2. Indoor unit PCB failure 3. Sensor problem (main reason)
02	Indoor unit pipe inlet sensor error		
06	Indoor unit pipe outlet sensor error		

■ Error diagnosis and countermeasure flow chart



** In case the value is more than 100kΩ (open) or less than 100Ω (short), Error occurs

Refer: Resistance value maybe change according to temperature of temp sensor,
It shows according to criteria of current temperature(±5% margin) → Normal
Air temp sensor: 10°C = 20.7kΩ : 25°C= 10kΩ : 50°C= 3.4kΩ
Pipe temp sensor: 10°C = 10kΩ : 25°C= 5kΩ : 50°C= 1.8kΩ



← CN-ROOM : Indoor air temp sensor
← CN-PIPE IN : Pipe inlet temp sensor
← CN-PIPE OUT : Pipe outlet temp sensor



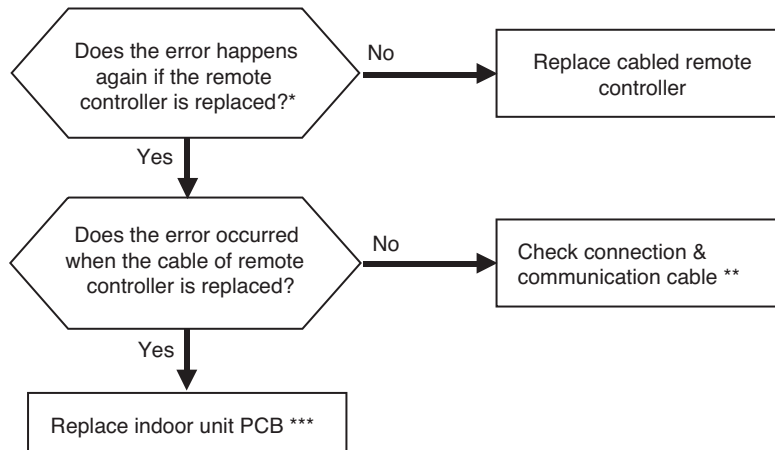
← Measure the resistance of outlet pipe temp sensor.

6.6 Troubleshooting Indoor Error

CH 03 (No communication between cabled remote controller & indoor unit)

Error No.	Error Type	Error Point	Main Reasons
03	No communication between cabled remote controller & indoor unit	The remote controller did not receive the signal from indoor unit during specific time	1. Remote controller fault 2. Indoor unit PCB fault 3. Connector fault, Wrong connection 4. Communication cable problem

■ Error diagnosis and countermeasure flow chart



* If there is no remote controller to replace : Use another unit's remote controller doing well

** Check cable : Contact failure of connected portion or extension of cable are main cause
Check any surrounded noise (check the distance with main power cable)
→ make safe distance from the devices generate electromagnetic wave

*** After replacing indoor unit PCB, do Auto Addressing & input unit's address if connected to central controller.
(All the indoor units connected should be turned on before Auto Addressing)



CN-REMO : Remote controller connection

* The PCB can differ from model to model.
Check from the right source.



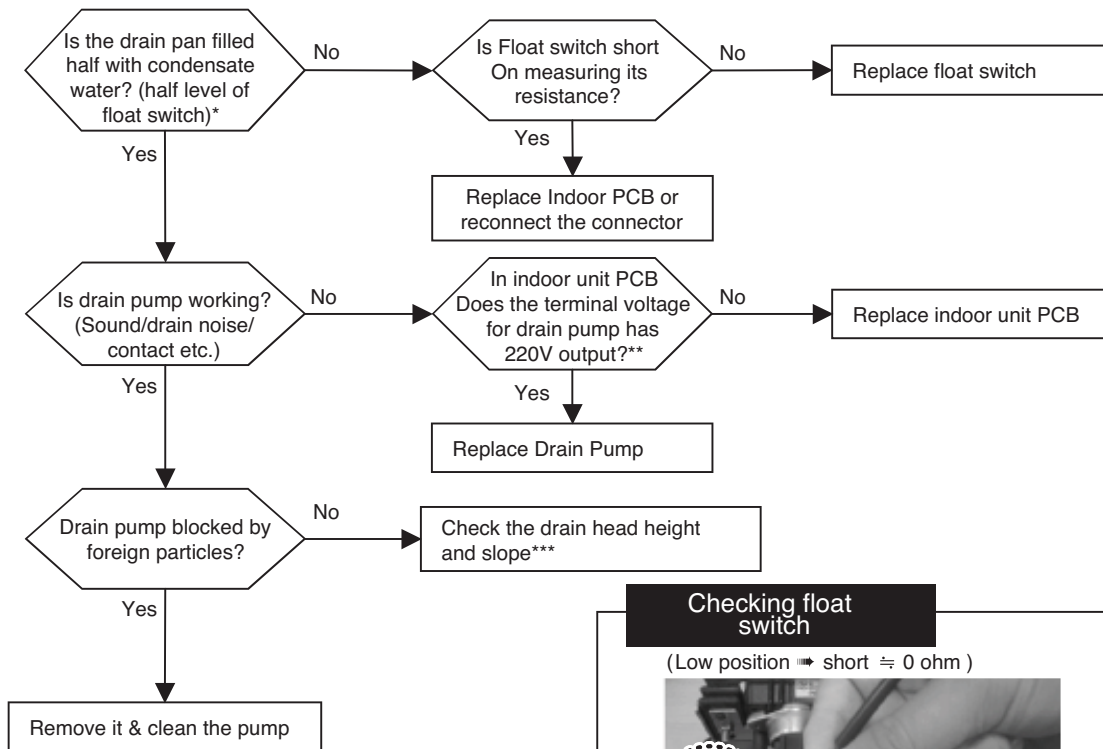
Checking communication cable connection status

6.6 Troubleshooting Indoor Error

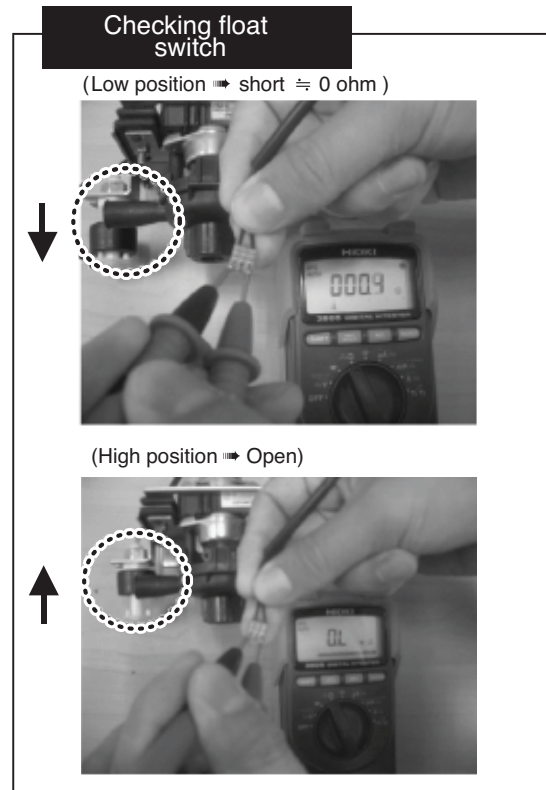
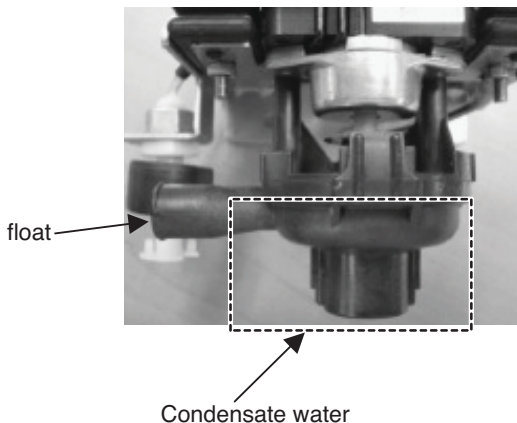
CH 04 (Drain pump error)

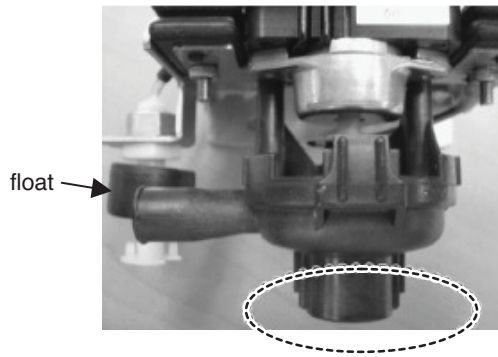
Error No.	Error Type	Error Point	Main Reasons
04	Drain pump error	Float switch is open due to rising of condensate water level because of drain pump fault or drain pipe clogging	1. Drain pump/float switch fault 2. Improper drain pipe location, clogging of drain pipe 3. Indoor unit PCB fault

■ Error diagnosis and countermeasure flow chart



* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.

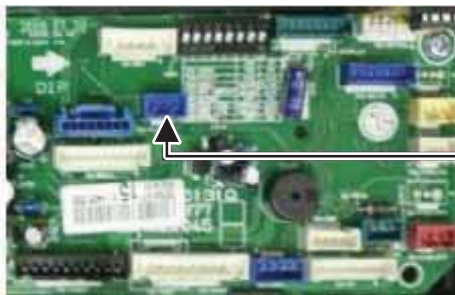




A:Point to check rotating

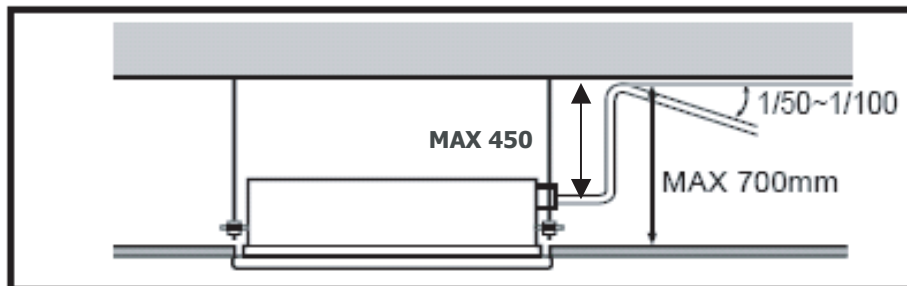


*** Indoor PCB drain pump connector
(Check input of 220V)
(Marked as **CN-DPUMP**)



Float switch Housing (CN-FLOAT)

[***] Standard of drain pipe head height / slope



6.6 Troubleshooting Indoor Error

CH 09 (Indoor unit EEPROM error)

Error No.	Error Type	Error Point	Main Reasons
09	Indoor unit EEPROM error	Error occur in EEPROM of the Indoor PCB	1. Error developed in communication between the micro-processor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage

■ Error diagnosis and countermeasure flow chart

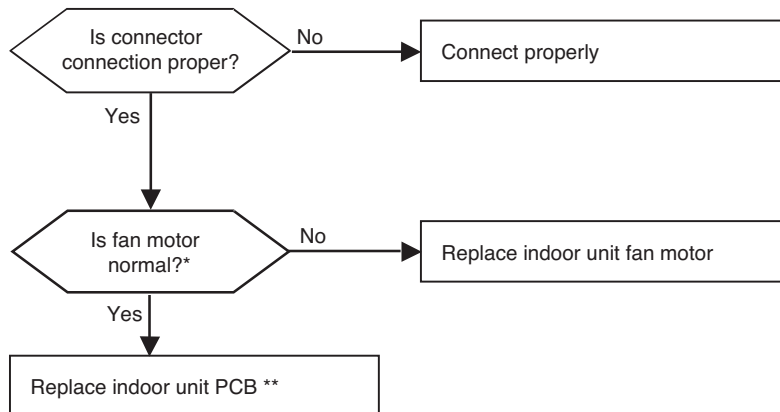
- Replace the indoor unit PCB, and then make sure to perform Auto addressing and input the address of central control

6.6 Troubleshooting Indoor Error

CH 10 (Indoor unit BLDC fan motor failure)

Error No.	Error Type	Error Point	Main Reasons
10	Indoor unit BLDC fan motor failure	Indoor BLDC fan motor feedback signal is absent (for 50 sec.)	1. Motor connector connection fault 2. Indoor PCB fault 3. Motor fault

■ Error diagnosis and countermeasure flow chart



* It is normal when check hall sensor of indoor fan motor as shown below



Each terminal with the tester

Tester		Normal resistance(±10%)	
+	-	TH chassis	TD chassis
①	④	∞	∞
⑤	④	hundreds kΩ	hundreds kΩ
⑥	④	∞	∞
⑦	④	hundreds kΩ	hundreds kΩ

<Checking connection state of fan motor connector>



** Replace the indoor unit PCB, and then make sure to do Auto addressing and input the address of central control

(Notice: The connection of motor connector to PCB should be done under no power supplying to PCB)

6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

Items		Contents
Purpose		Protection of the IPM parts and compressor in the PCB assembly from over-current.
Condition for Generation		Generation when over-current is detected in IPM.
Expected Causes	Installation & Overload	Outdoor device shielding, closing of a SVC valve, under/over charging of refrigerant, infiltration of water into refrigerant, outdoor fan fault, EEV (Electric Expansion Valve) fault, fault of a temperature sensor or its connection, blocking of an indoor device filter, and bending/blocking of a pipe.
	Compressor	Open/Short of the coil in the compressor, insulation breaking between the coil in the compressor and the pipe or panel, damage of compressor with abrasion, and compressor connection fault.
	PCB Assembly	IPM part fault, fault-signal detection circuit fault, compressor current detection circuit fault, and DC link detection circuit fault.
	Others	Improper power input, IPM connection fault, and insufficient distance between heat sink and control panel.

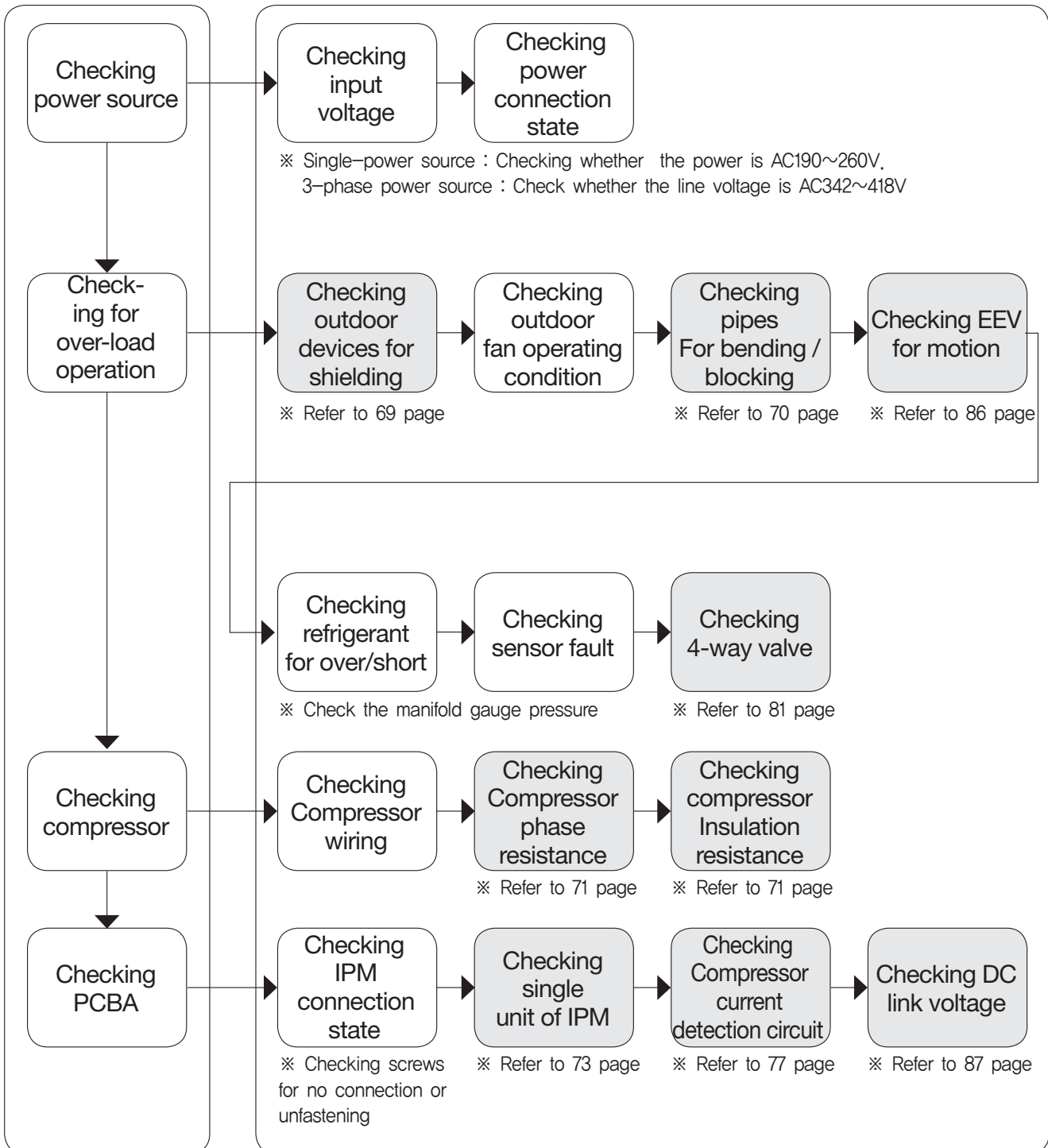
6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

Flow of trouble diagnosis

Items for checking

Sub-items for checking



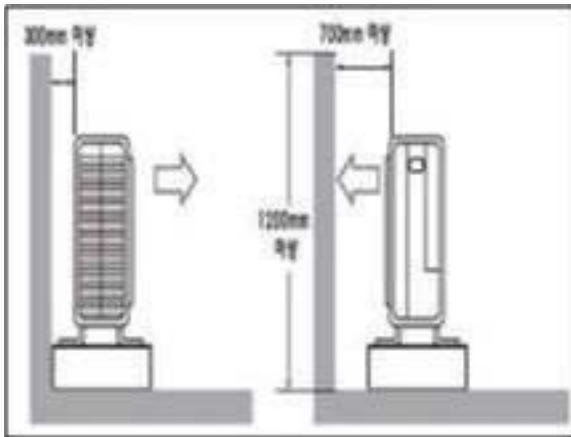
6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

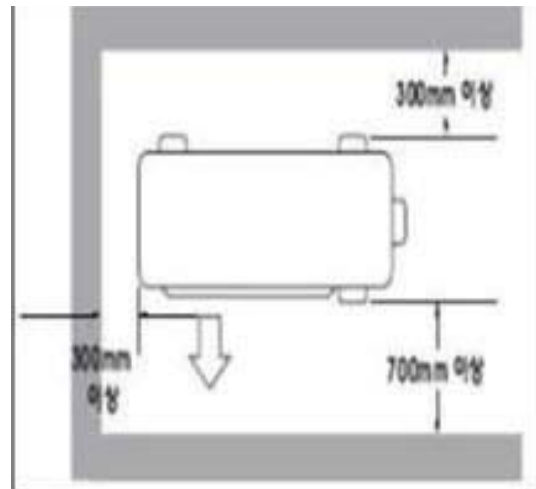
Checking outdoor devices for shielding

Cause of Trouble	Condition	Mechanism of Fault Generation
Whirlwind	Blocking of the front part of outdoor devices	Frequent turning-off of the compressor : Inflow of high-temperature air generated by outdoor fans into the air conditioner → Wrong influence to the system in over-load state
	Installation of outdoor devices in narrow space	
Shielding	Blocking of the lateral suction point on the wall of the outdoor devices Foreign substances in the heat exchanger and obstacles in the surrounding	Frequent turning-off of the compressor : Elevation of the pipe temperature due to reduced wind velocity → Wrong influence to the system in over-load state
Corrosion	Possible infiltration of moisture / highly humid area	Corrosion of heat exchanger → Reduced operation efficiency → Transfer of troubles to other parts

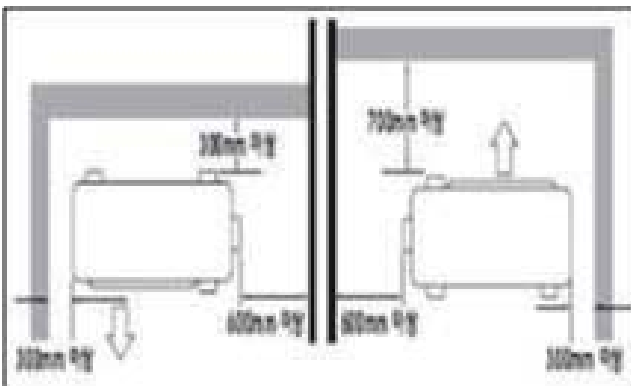
■ When the front/back has a wall (1 side)



■ When the front/back/left/right have walls (3 sides)



■ When the front/back/left/right have walls (2 sides)



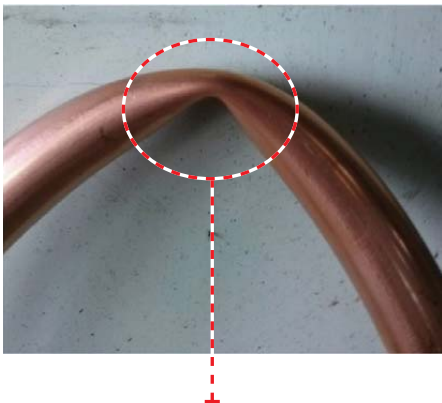
6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

Generation of refrigerant flow disturbance

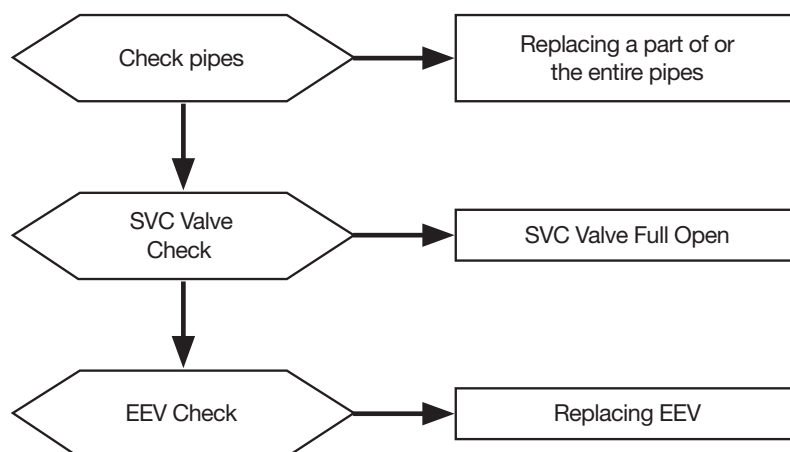
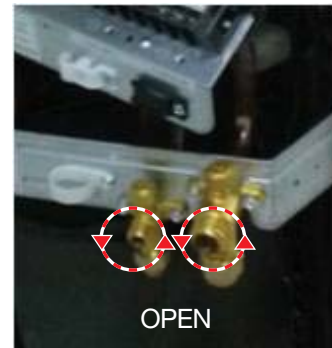
Cause of Trouble	Condition	Mechanism of Fault Generation
Generation of refrigerant flow disturbance	Bending/Blocking of a pipe EEV fault Closing of SVC Valve	Freezing of indoor device → Reduced evaporation temperature due to excessive expansion of refrigerant. Weak heating and cooling → Insufficient flow of refrigerant Frequent turning on/off of the compressor by the high/low pressure protection logic → Accumulated refrigerant elevates the temperature and reduces the pressure. Wrong oil collection elevates the outlet temperature of the compressor and damages the compressor.

■ Bending/Blocking of a pipe



Bending of a pipe

■ Checking SVC Valve



※ **EEV Checking Method :**
Check the opening/closing sound of EEV when the power is applied for the first time.

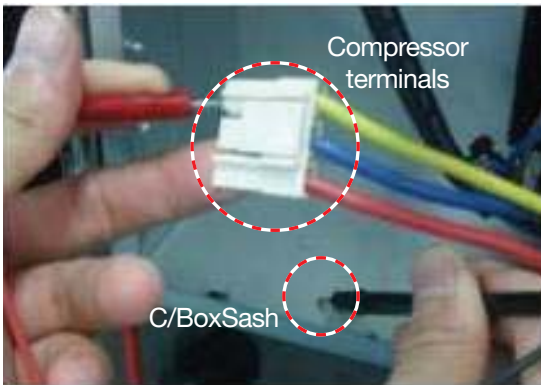
6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

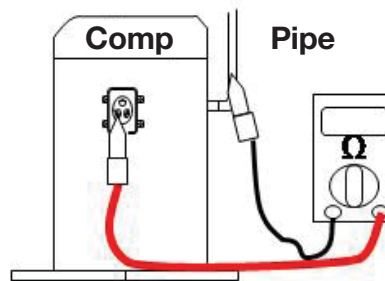
Checking compressor phase resistance

Purpose	Judgment of the fault of the compressor.	Items for checking	1. Measurement of insulation resistance between the compressor and panel. 2. Measurement of phase resistance. 3. Wiring Check.
---------	--	--------------------	--

■ How to check the insulation resistance between the compressor and panel



Measure the resistance between a compressor terminal and panel.



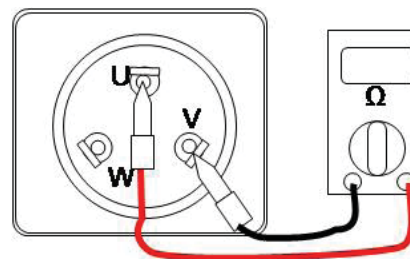
Terminal	Insulation Resistance
U-panel	$\geq 10M\Omega$
V-panel	$\geq 10M\Omega$
W-panel	$\geq 10M\Omega$

1. Turn the switch of the tester to "Resistance" mode and check the resistance
2. Measure the resistance between the terminals.
3. "0Ω" means the short of compressor phase. (Replace the compressor)
4. Refer to the compressor resistance standards.
5. If any disorder is found, measure the line resistance between the terminals of the compressor as shown below.
6. If the compressor is found to be normal, any compressor connection wire may have a fault.

■ How to check the U, V, and W phase resistance



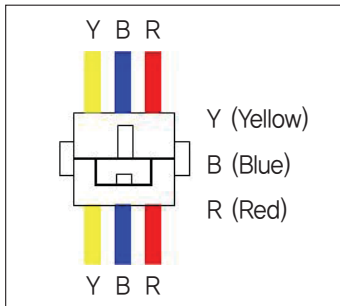
Measure the line resistance between the compressor terminals.



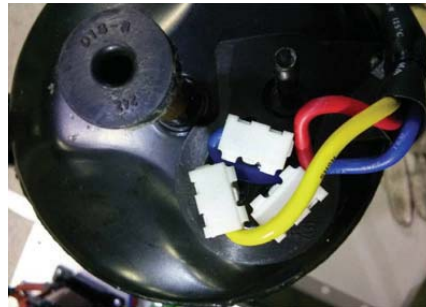
Model	GKT141MAC	GKT176MAB	GJT240MAA	GPT442MBA	GPT442MAA	
Windings Resistance (at 25°C)	U-V	$1.040 \pm 7\% \Omega$	$1.125 \pm 7\% \Omega$	$0.628 \pm 7\% \Omega$	$0.438 \pm 7\% \Omega$	$0.845 \pm 7\% \Omega$
	V-W	$1.040 \pm 7\% \Omega$	$1.125 \pm 7\% \Omega$	$0.628 \pm 7\% \Omega$	$0.438 \pm 7\% \Omega$	$0.859 \pm 7\% \Omega$
	W-U	$1.040 \pm 7\% \Omega$	$1.125 \pm 7\% \Omega$	$0.628 \pm 7\% \Omega$	$0.438 \pm 7\% \Omega$	$0.864 \pm 7\% \Omega$

<p>Purpose</p>	<p>Judgment of the fault of the compressor.</p>	<p>Items for checking</p>	<ol style="list-style-type: none"> 1. Measurement of insulation resistance between the compressor and panel. 2. Measurement of phase resistance. 3. Wiring Check.
-----------------------	---	----------------------------------	--

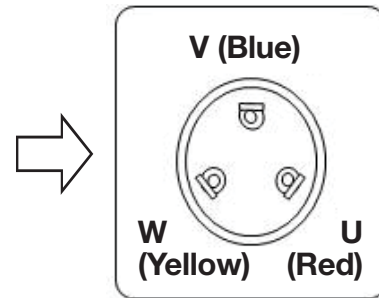
■ How to check the compressor wiring error



Check whether the PCB wires and compressor wires are connected in the same colors.



Check whether the compressor wires are properly connected with U, V, and W.



※ The wiring direction is CCW, (counter clock wise)



[Picture of normal compressor wiring]

6.7 Troubleshooting Outdoor Error

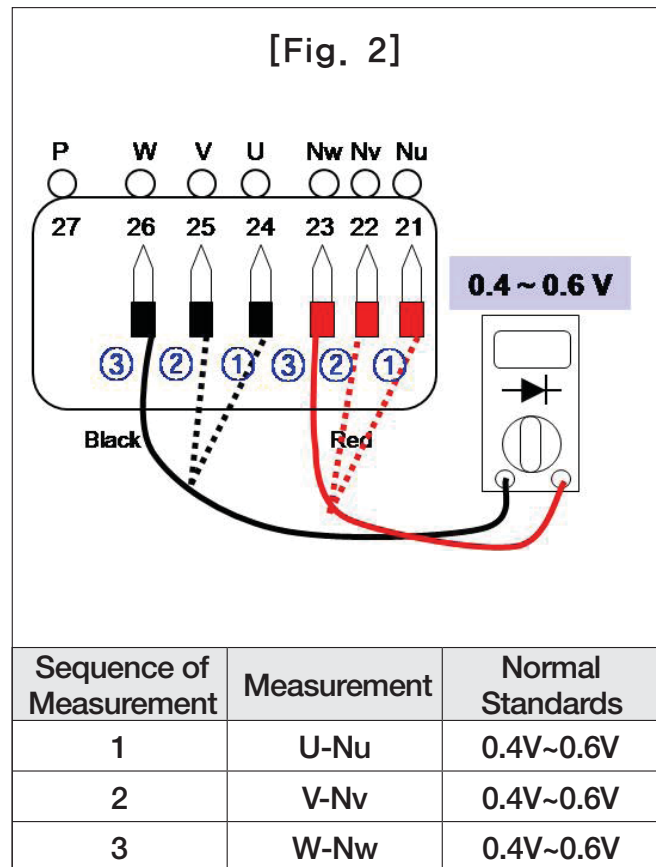
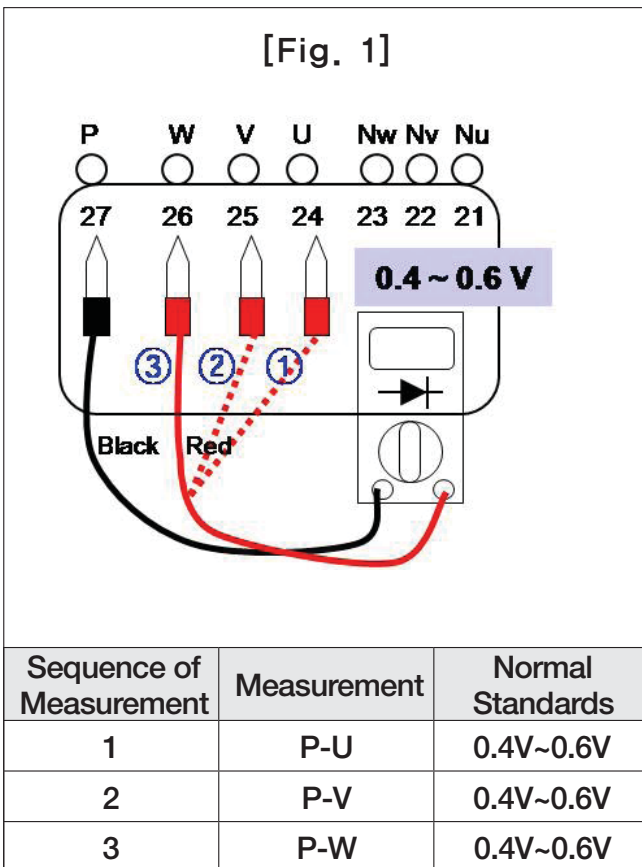
CH 21 (DC Peak / Comp IPM Fault)

IPM Check

Purpose	Judgment of the IPM part fault of PCB assembly.	Items for checking	1. Judgment of damage of IGBT 2. Checking the soldering state
---------	---	--------------------	--

■ How to check IPM IGBT (Diode Mode)

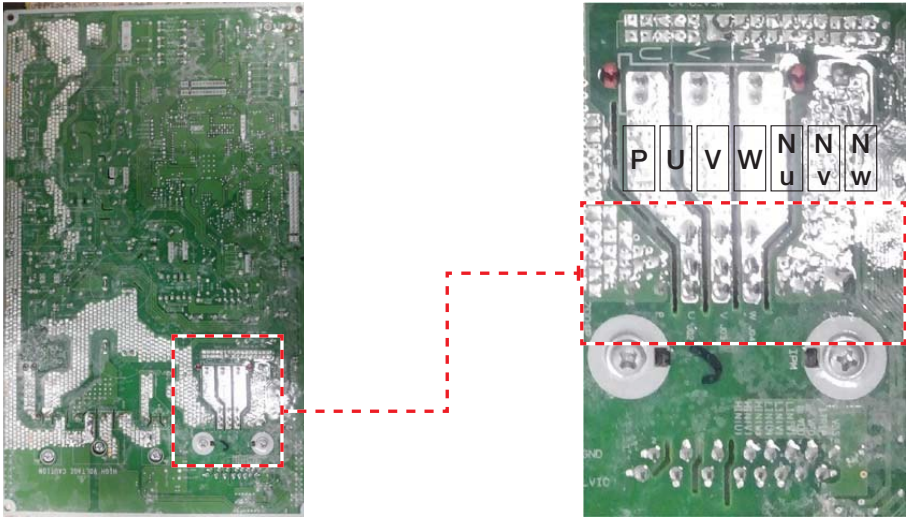
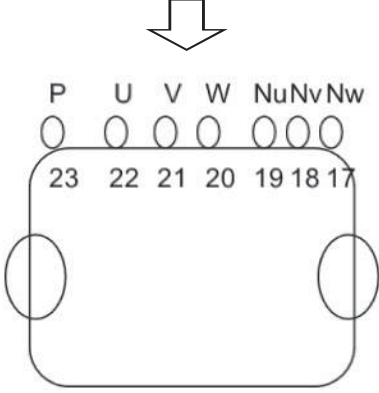
1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. ($\rightarrow|+$)
3. Measure the voltages of P~U / P~V / P~W as shown in Fig. 1.
4. Measure the voltages of U~Nu / V~Nv / W~Nw as shown in Fig. 2.
5. If the measurements are significantly different from the levels shown in the figures, the IPM is deemed to be damaged.



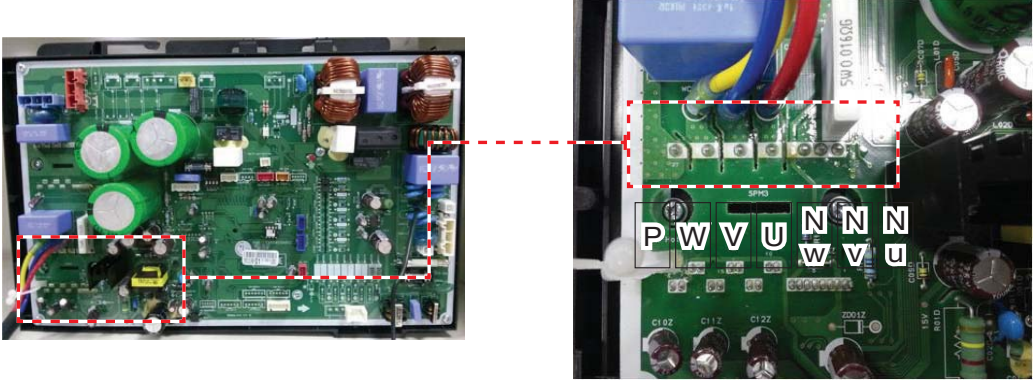
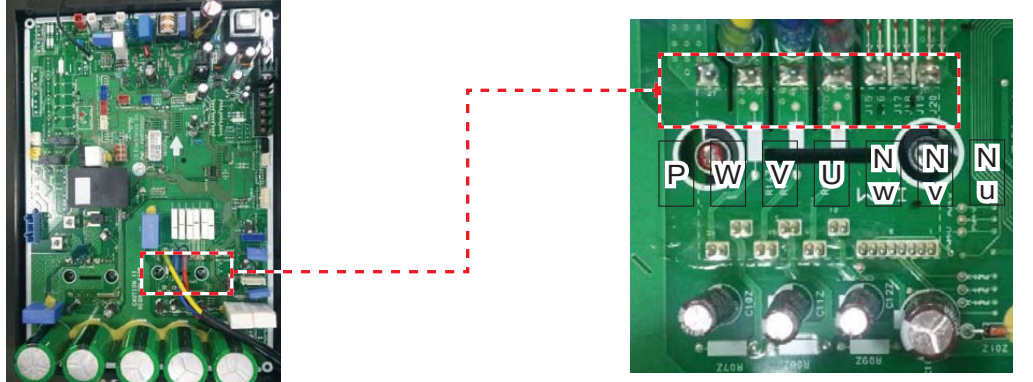
Purpose	Judgment of the IPM part fault of PCB assembly.	Items for checking	1. Judgment of damage of IGBT 2. Checking the soldering state
----------------	---	---------------------------	--

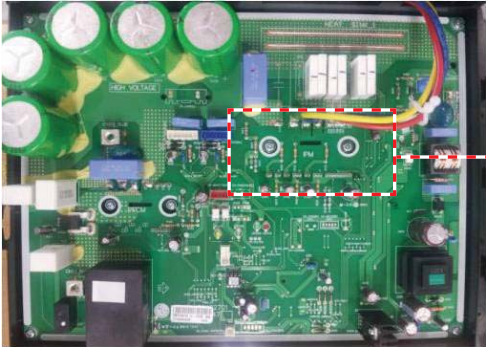
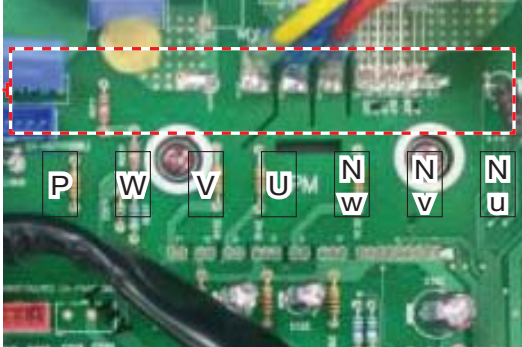
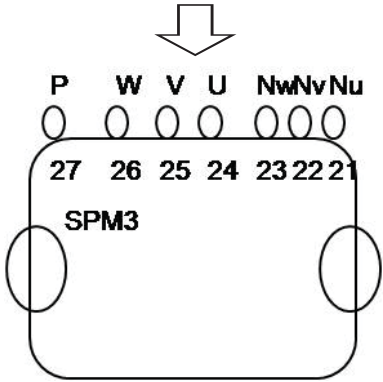

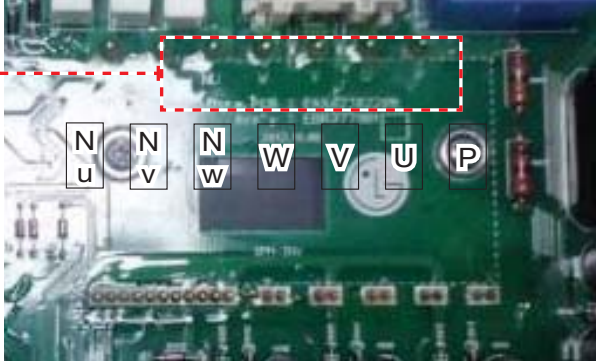
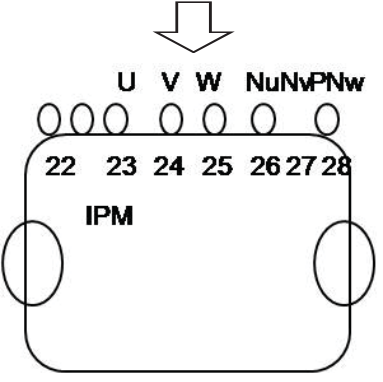
Step	Flow of Inspection
1	Turn the power off (wait until the outdoor device LED is turned off)
2	Remove compressor wires.
3	Measure the voltage as shown in the figure.
4	Check the voltage for being in the range of 0.4~0.6V.
5	Judge IPM Pins for short.

■ IPM Check Point

구분	IPM Check Point
2/2.5kW	<div style="text-align: center;">  </div> <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: center;">[IPM Pin Arrangement and Pin Numbers]</p>

4. Trouble Shooting

구분	IPM Check Point
4kW	 <p>The image shows two views of a 4kW IPM. The left view is a wide shot of the PCB with a red dashed box highlighting the IPM area. The right view is a close-up of the IPM pins, with labels P, W, V, U, N, N, N, W, V, U overlaid on the pins. A red dashed box highlights the top three pins (P, W, V) and the bottom three pins (W, V, U). Below the close-up is a diagram of the IPM pin arrangement. The diagram shows a top row of pins labeled P, W, V, U, N, N, N and a bottom row labeled W, V, U. Pin numbers 27, 26, 25, 24, 23, 22, 21 are shown below the top row. The IPM is labeled SPM3. A downward arrow points from the close-up image to the diagram.</p> <p>[IPM Pin Arrangement and Pin Numbers]</p>
5kW	 <p>The image shows two views of a 5kW IPM. The left view is a wide shot of the PCB with a red dashed box highlighting the IPM area. The right view is a close-up of the IPM pins, with labels P, W, V, U, N, N, N, W, V, U overlaid on the pins. A red dashed box highlights the top three pins (P, W, V) and the bottom three pins (W, V, U). Below the close-up is a diagram of the IPM pin arrangement. The diagram shows a top row of pins labeled P, W, V, U, N, N, N and a bottom row labeled W, V, U. Pin numbers 27, 26, 25, 24, 23, 22, 21 are shown below the top row. The IPM is labeled SPM3. A downward arrow points from the close-up image to the diagram.</p> <p>[IPM Pin Arrangement and Pin Numbers]</p>

구분	IPM Check Point
6kW	<div style="display: flex; justify-content: space-around;">   </div> <div style="text-align: center; margin-top: 20px;">  <p>[IPM Pin Arrangement and Pin Numbers]</p> </div>
7kW	<div style="display: flex; justify-content: space-around;">   </div> <div style="text-align: center; margin-top: 20px;">  <p>[IPM Pin Arrangement and Pin Numbers]</p> </div>

6.7 Troubleshooting Outdoor Error

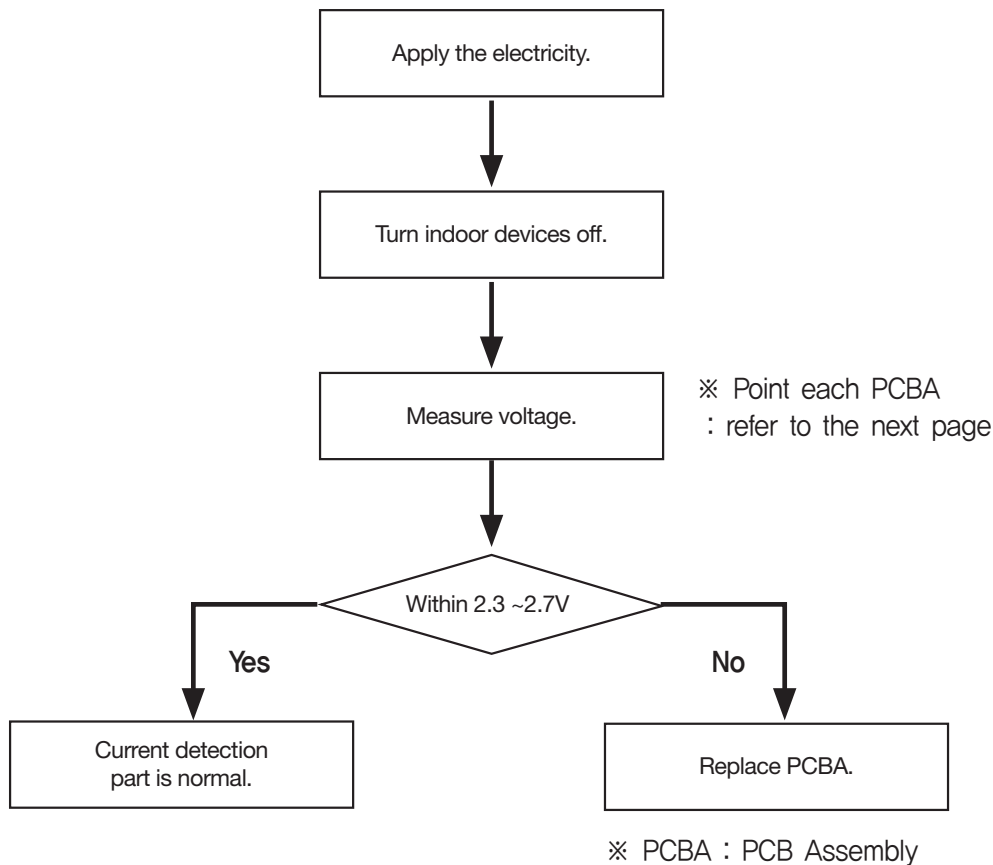
CH 21 (DC Peak / Comp IPM Fault)

Compressor Phase Current Detection Circuit

Purpose	Judgment of the IPM part fault of PCB assembly.	Items for checking	1. Checking for current detection error.
----------------	---	---------------------------	--

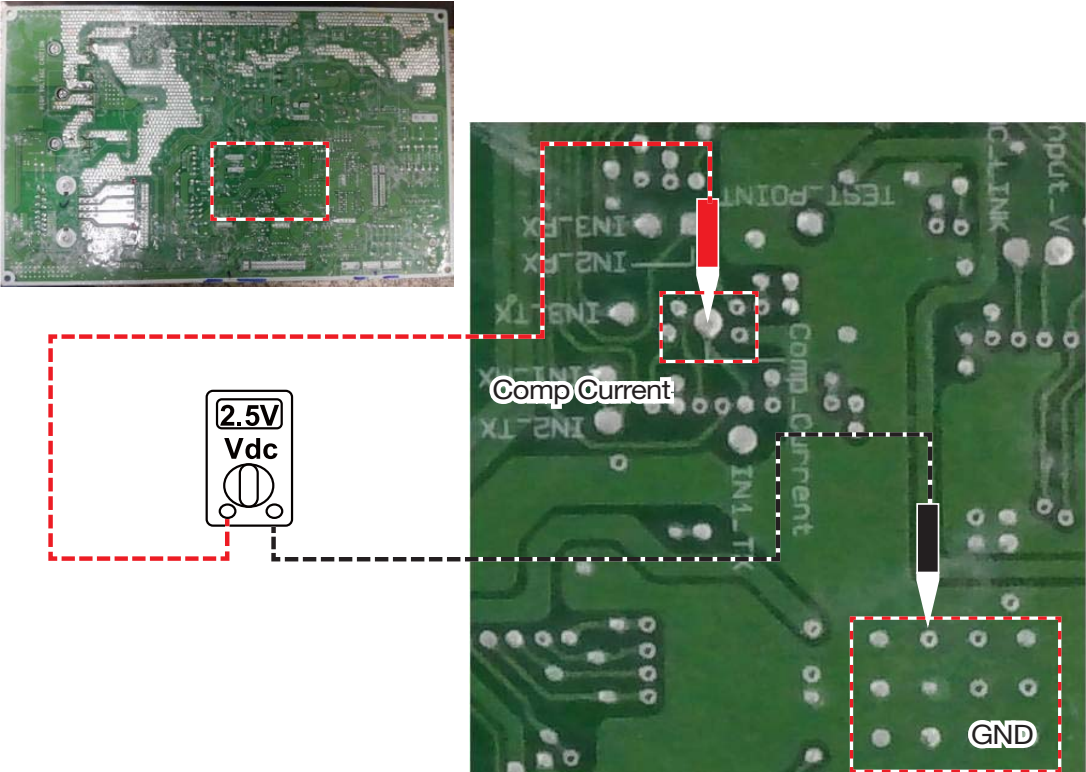
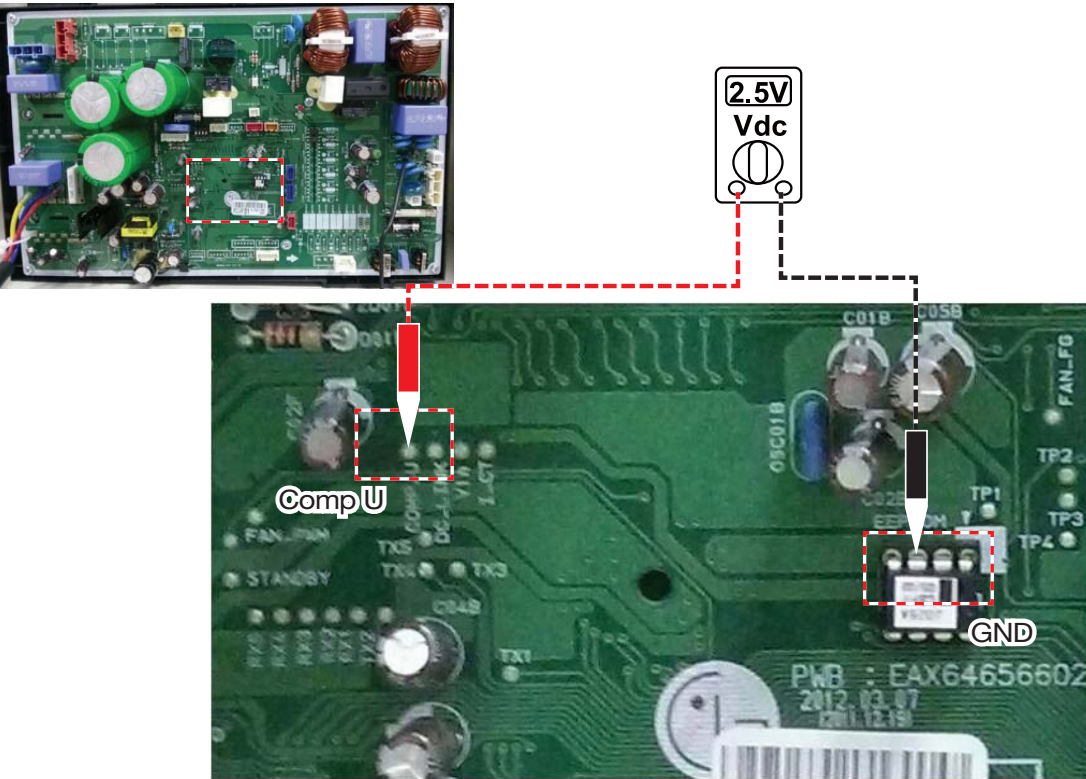
1. Set the tester in DC Voltage Mode and check the Voltage.
2. Measure the voltage in the order of "U-GND/V-GND/W-GND."
3. The standard of normal voltage measurement is $2.5V \pm 0.2V$.
4. If the measurement is different from the standard, replace PCBA.

Checking method

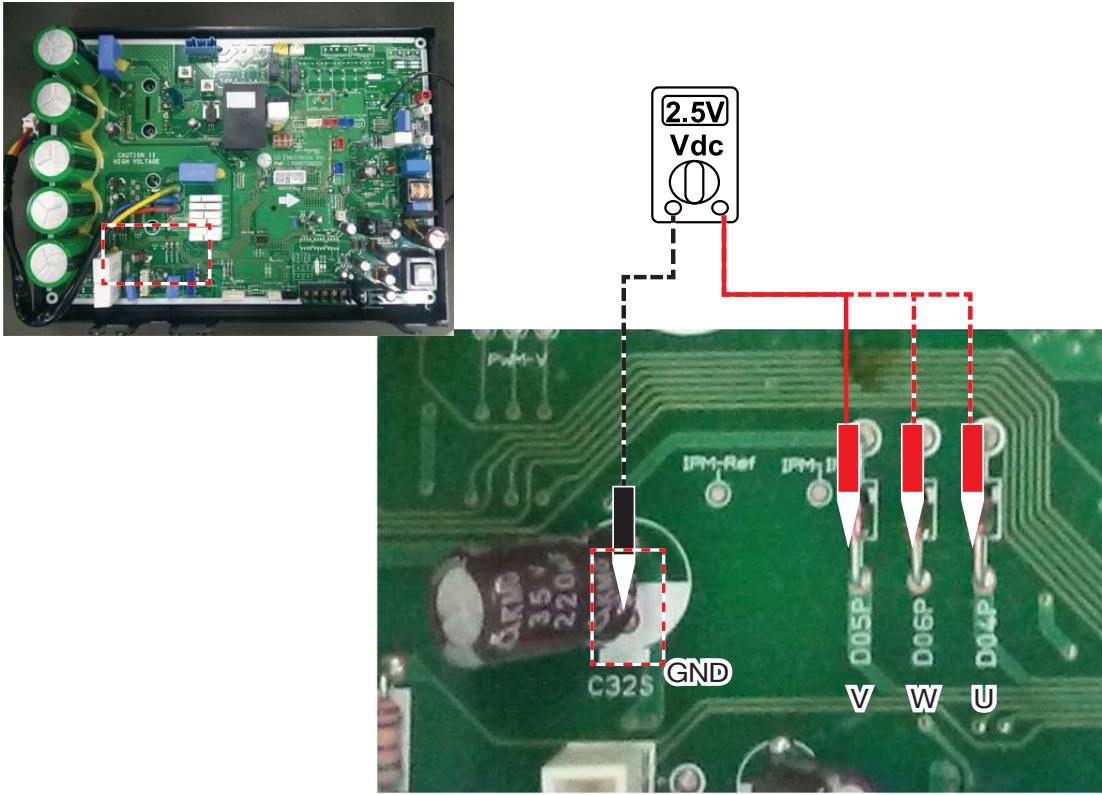
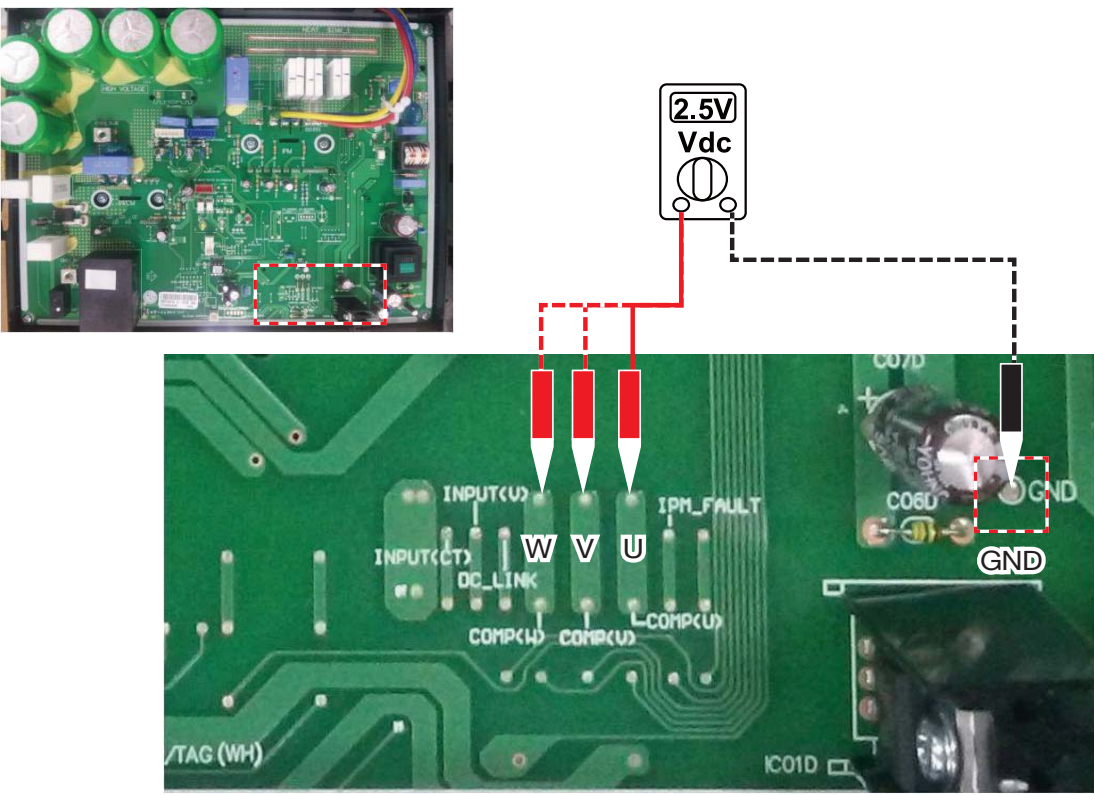


! Caution : When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

■ Current Detection Circuit Check Point

구분	Compressor Phase Current Detection
2/2.5kW	 <p>2.5V Vdc</p> <p>Comp Current</p> <p>GND</p>
4kW	 <p>2.5V Vdc</p> <p>Comp U</p> <p>GND</p>

4. Trouble Shooting

구분	Compressor Phase Current Detection
5kW	 <p>The diagram for the 5kW unit shows a top-down view of the PCB with a red dashed box highlighting the current detection area. A close-up view shows a 2.5V Dc power source connected to three test points labeled V, W, and U. A black probe tip is shown touching a GND point near capacitor C325. The test points are labeled D05P, D06P, and D04P.</p>
6kW	 <p>The diagram for the 6kW unit shows a top-down view of the PCB with a red dashed box highlighting the current detection area. A close-up view shows a 2.5V Dc power source connected to three test points labeled W, V, and U. A black probe tip is shown touching a GND point near capacitor C06D. The test points are labeled INPUT(U), INPUT(W), and INPUT(V). Other labels include DC_LINK, COMP(W), COMP(V), COMP(U), L-COMP(U), IPM_FAULT, TAG (WH), and IC01D.</p>

구분	Compressor Phase Current Detection
7kW	<p>The diagram illustrates the wiring for phase current detection on a 7kW compressor PCB. A 2.5V Dc source is connected to the top terminals of three current sense resistors labeled V, U, and W. A ground connection (GND) is also shown, connected to a specific point on the PCB. The PCB includes components like capacitors (C02P, C01P), resistors (R01P), and an LED (LED04M). The PCB is marked with 'bare PCB : EAX42702', 'Ass'y : EBR3779E', and '2012.11.06'. Other markings include 'V W U', 'IPM-INV', and 'GND'.</p>

6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

4-Way Valve Check

Purpose	Items for checking
Judge whether the 4-way valve part has any fault,	1. Check the working voltage of the 4-way valve. 2. Check the 4-way valve coil resistance.

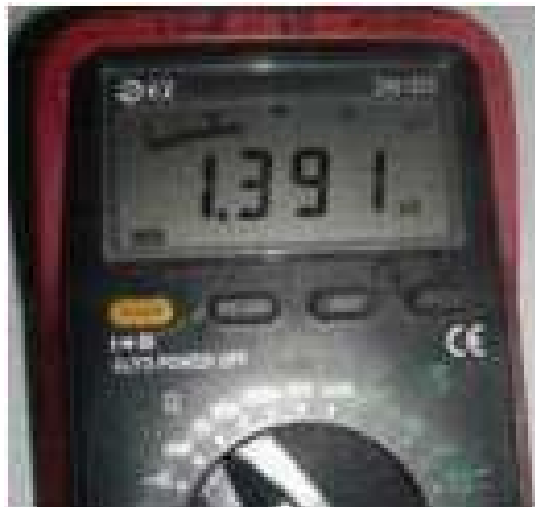
■ Checking the output voltage of CN-4way (refer to next page)

1. Set the tester in AC Voltage Mode and check the current.
2. Check the output voltage between both ends of CN-4Way Connector.
3. The standard of normal voltage is $220V \pm 10\%$.
4. If the measurement is different from the standard, replace PCBA.

※ The measurement should be made at the time to start heating mode operation and at the time of standby after operation.

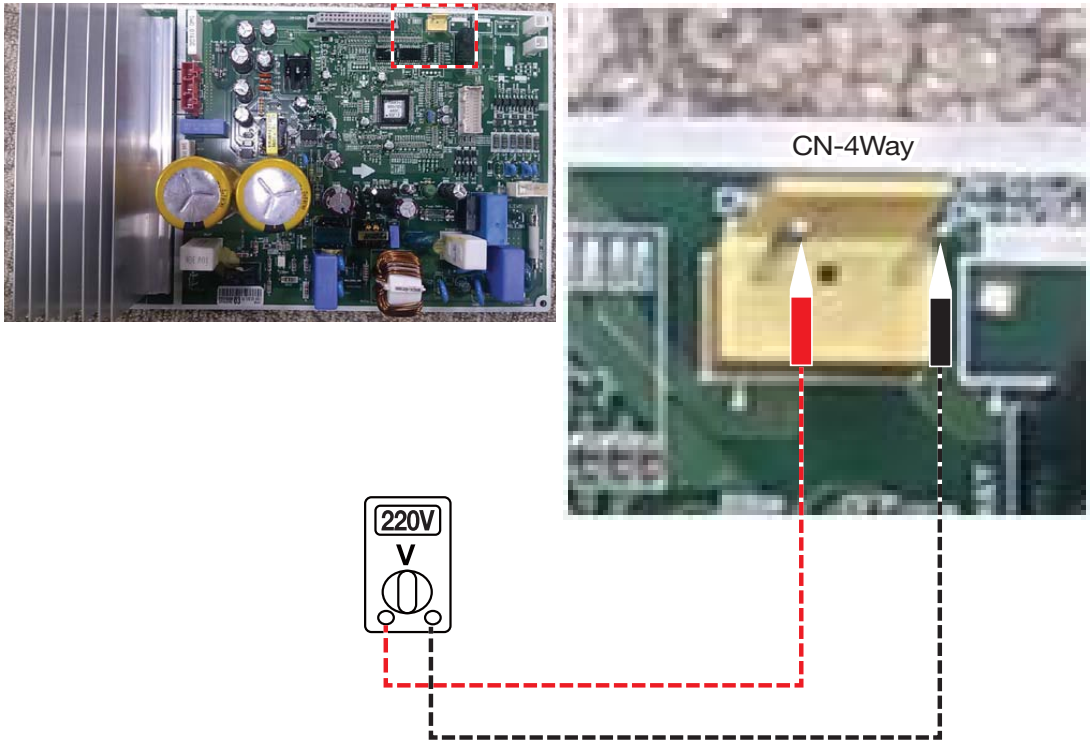
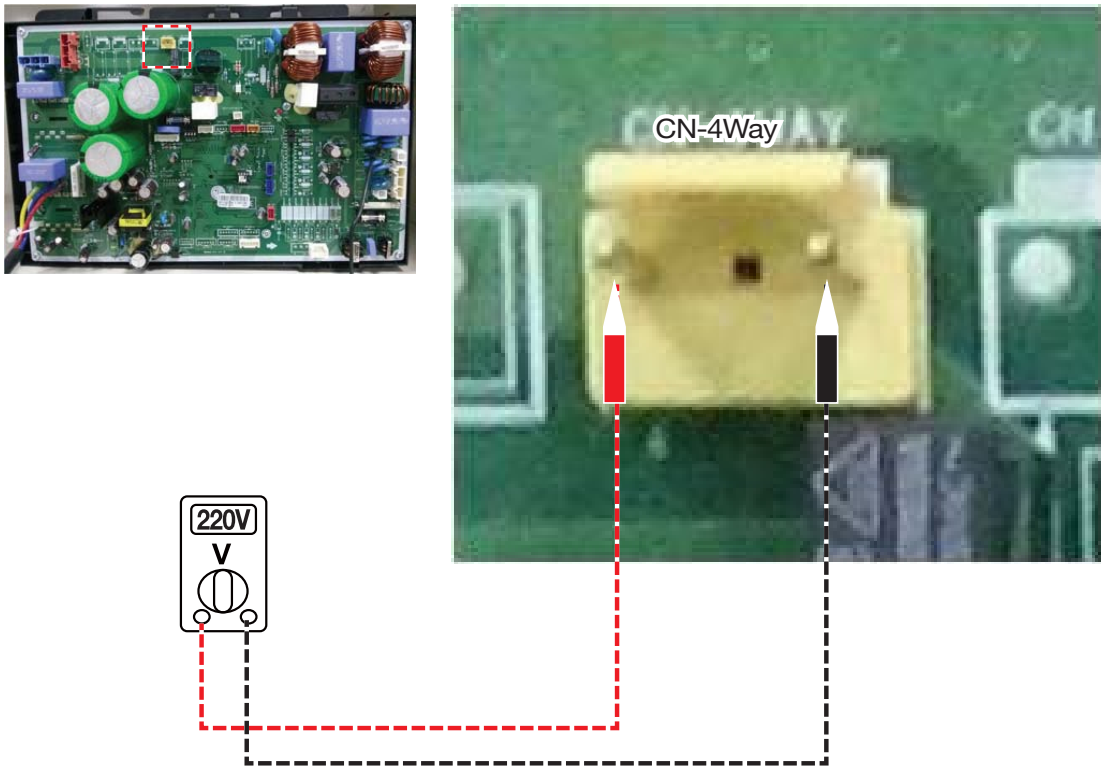
■ Check the 4-way.valve coil resistance.

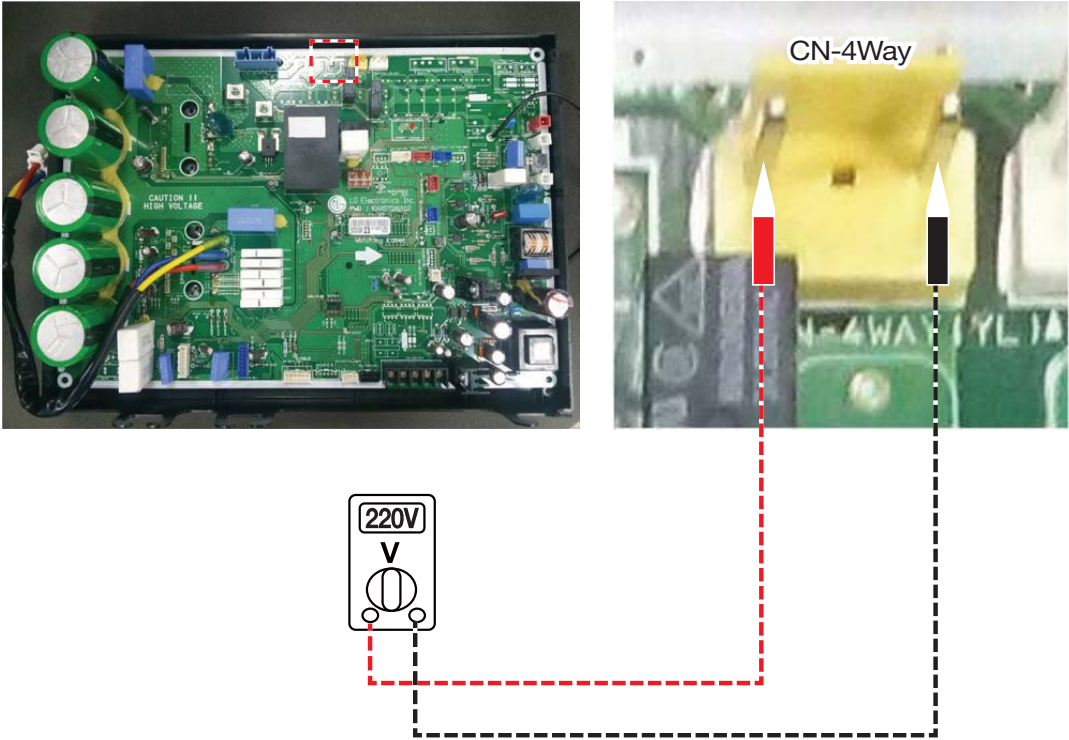
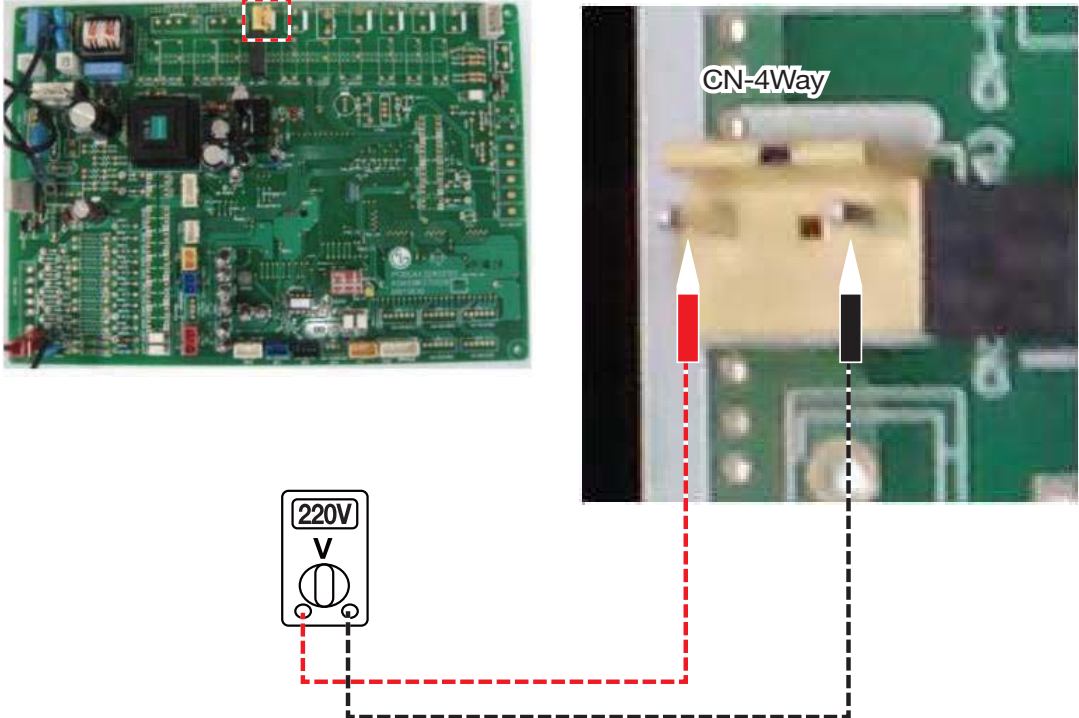
1. Set the tester in Resistance Mode and check the current.
2. Measure the resistance between the both ends of a single unit of 4-Way valve coil.
3. The standard of normal resistance is $14k\Omega \pm 10\%$.
4. If the measurement is different from the standard, replace 4-Way valve coil.

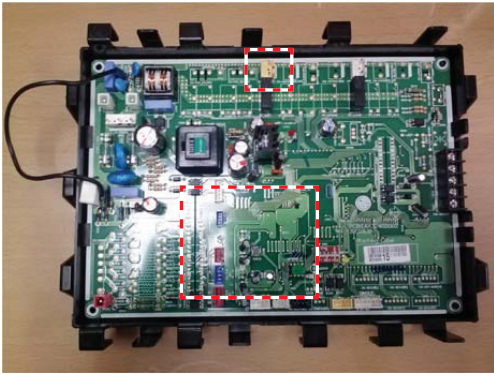
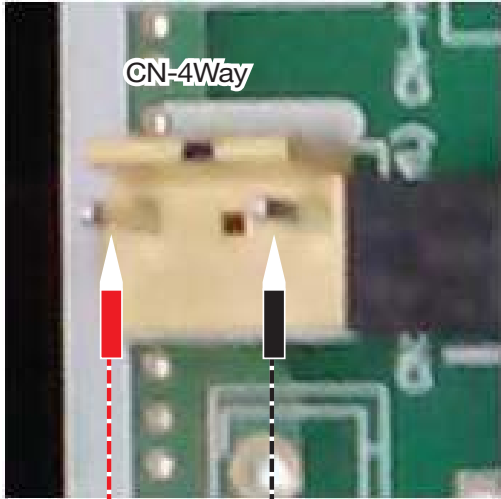
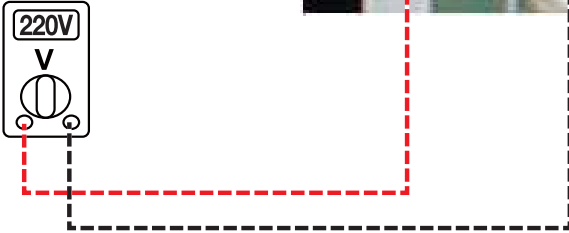


! Caution : When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

■ 4-Way Check Point

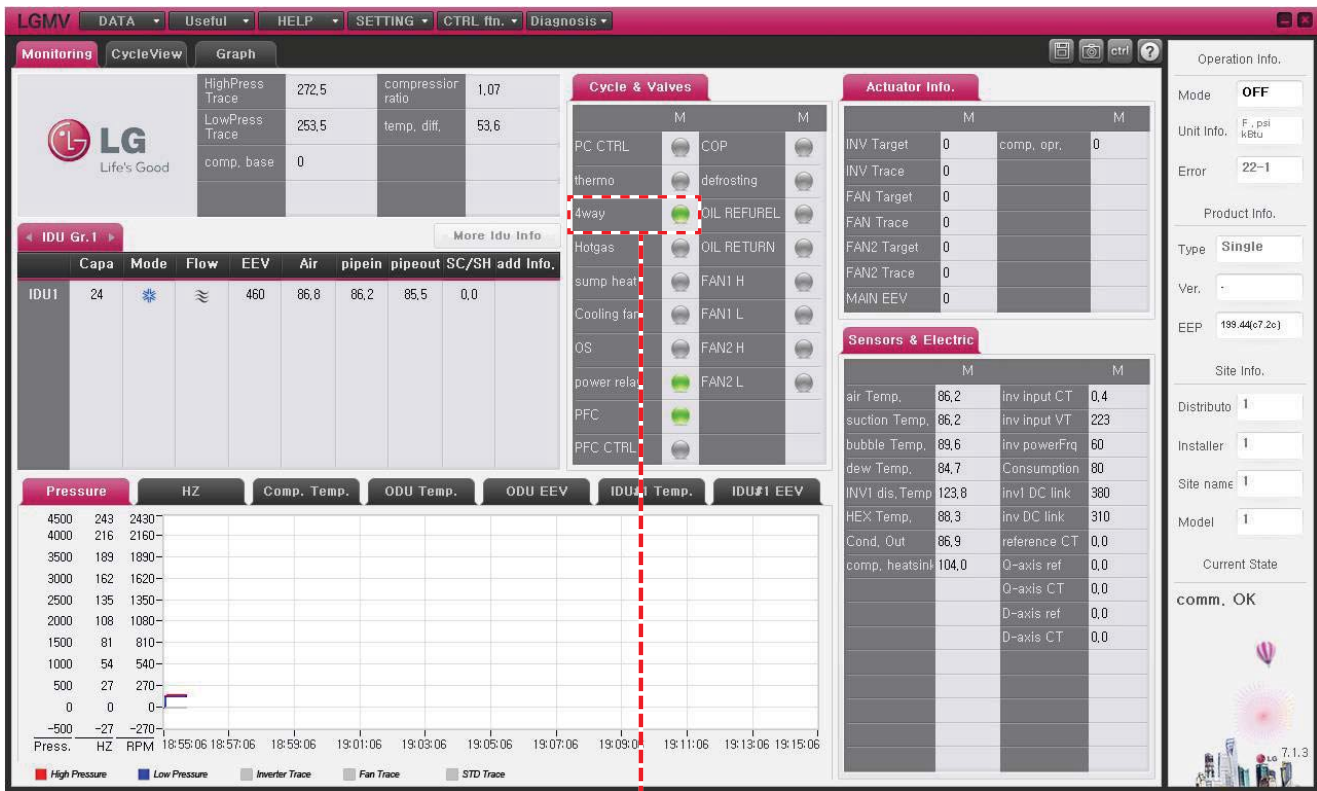
구분	4Way Check
2/2.5kW	 <p>The diagram for the 2/2.5kW model shows a main PCB view with a red dashed box highlighting the 4-way connector area. A close-up view of the yellow 'CN-4Way' connector is shown with a red arrow pointing to the left pin and a black arrow pointing to the right pin. A 220V AC voltage source is connected to the left pin via a red dashed line, and the right pin is connected to ground via a black dashed line.</p>
4kW	 <p>The diagram for the 4kW model shows a main PCB view with a red dashed box highlighting the 4-way connector area. A close-up view of the yellow 'CN-4Way' connector is shown with a red arrow pointing to the left pin and a black arrow pointing to the right pin. A 220V AC voltage source is connected to the left pin via a red dashed line, and the right pin is connected to ground via a black dashed line.</p>

구분	Compressor Phase Current Detection
5kW	 <p>The diagram for the 5kW unit shows a full view of the PCB with a red dashed box highlighting a component. A close-up of the 'CN-4Way' connector shows a red probe connected to the left terminal and a black probe connected to the right terminal. A voltmeter icon labeled '220V V' is shown with red dashed lines connecting its terminals to the probe connections on the connector.</p>
6kW	 <p>The diagram for the 6kW unit shows a close-up of the PCB with a red dashed box highlighting a component. A close-up of the 'CN-4Way' connector shows a red probe connected to the left terminal and a black probe connected to the right terminal. A voltmeter icon labeled '220V V' is shown with red dashed lines connecting its terminals to the probe connections on the connector.</p>

구분	Compressor Phase Current Detection
7kW	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Main PCBA</p> </div> <div style="text-align: center;">  <p>CN-4Way</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>220V V</p> </div>

4. Trouble Shooting

■ LGMV Display



When Heating, LED turn on
When Cooling, LED turn off

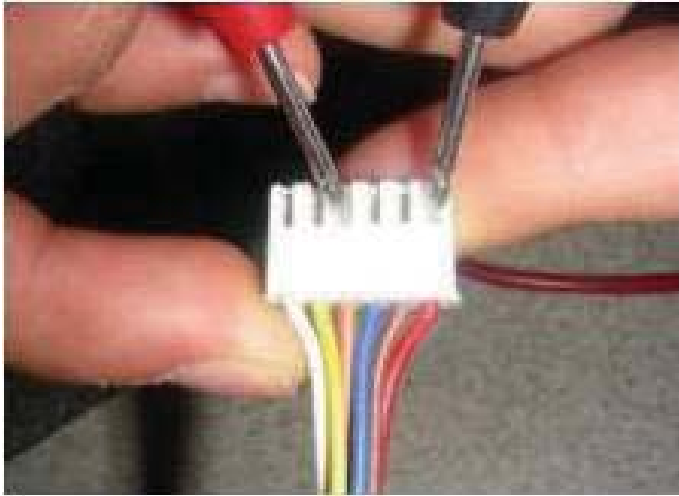
6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

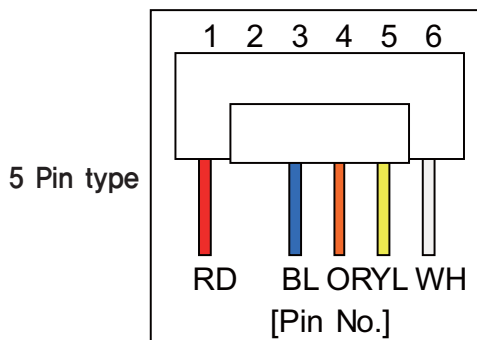
EEV Check

Purpose	Judging EEV part fault,	Items for checking	1. Measure EEV resistance,
---------	-------------------------	--------------------	----------------------------

■ Checking EEV resistance

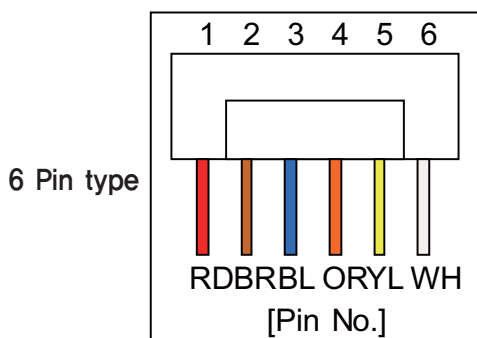


1. Set the tester in Resistance Mode and check the current.
2. Measure the resistance between eth Pins of EEV Connector.
3. For the measurement method and normal standard, refer to the Table.



[Table]

Measurement Pin	Normal Standard
1-3	$45 \Omega \pm 5 \Omega$
1-4	$45 \Omega \pm 5 \Omega$
1-5	$45 \Omega \pm 5 \Omega$
1-6	$45 \Omega \pm 5 \Omega$



[Table]

Measurement Pin	Normal Standard
1-4	$45 \Omega \pm 5 \Omega$
1-6	$45 \Omega \pm 5 \Omega$
2-3	$45 \Omega \pm 5 \Omega$
2-5	$45 \Omega \pm 5 \Omega$

※ There may be the difference in the resistance depending upon the EEV Specifications.

6.7 Troubleshooting Outdoor Error

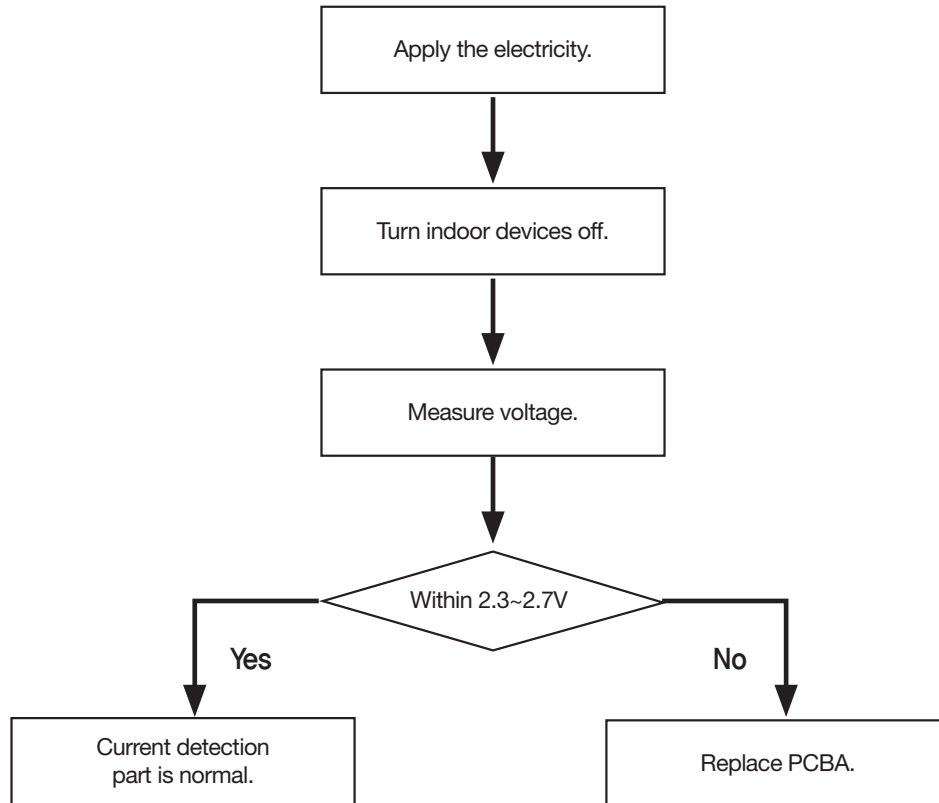
CH 21 (DC Peak / Comp IPM Fault)

DC Link Detection Circuit

Purpose	Generation of an error caused by DC link voltage detection error.	Items for checking	1. Checking DC link voltage detection error
----------------	---	---------------------------	---

1. Set the tester in DC Voltage Mode and check the current.
2. Checking the voltage between DC/L and Micom_GND.
3. The standard of normal voltage measurement is 2.4~2.8V.
4. If the measurement is different from the standard, replace PCBA.

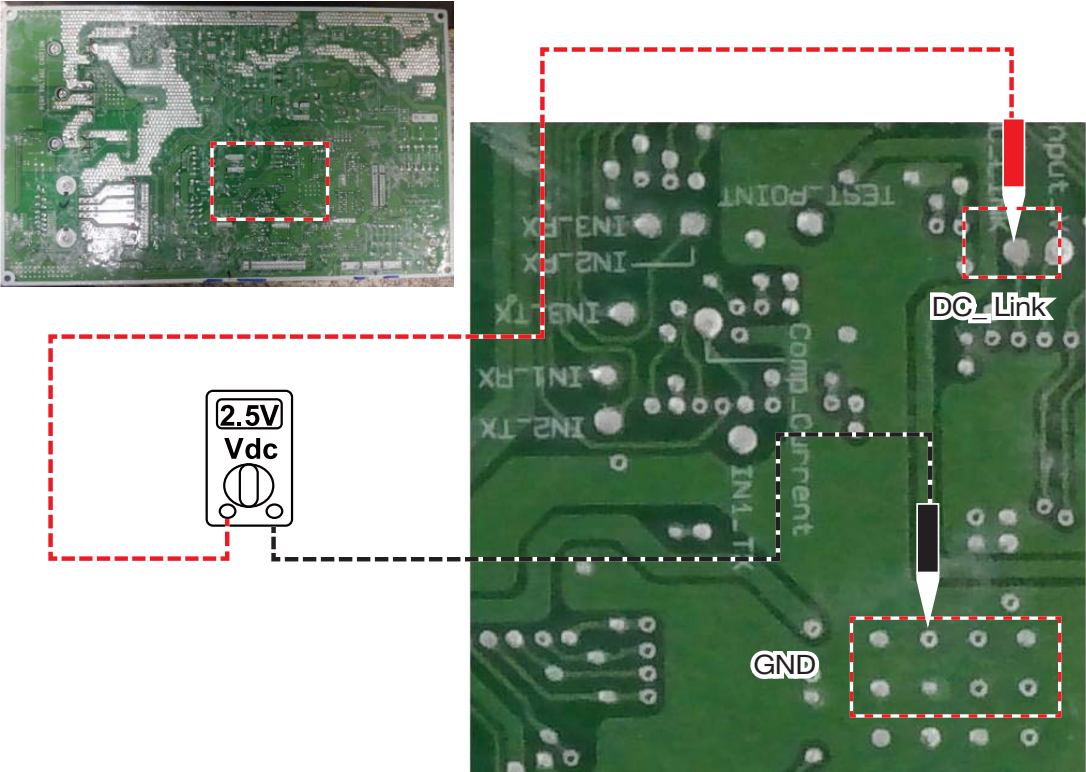
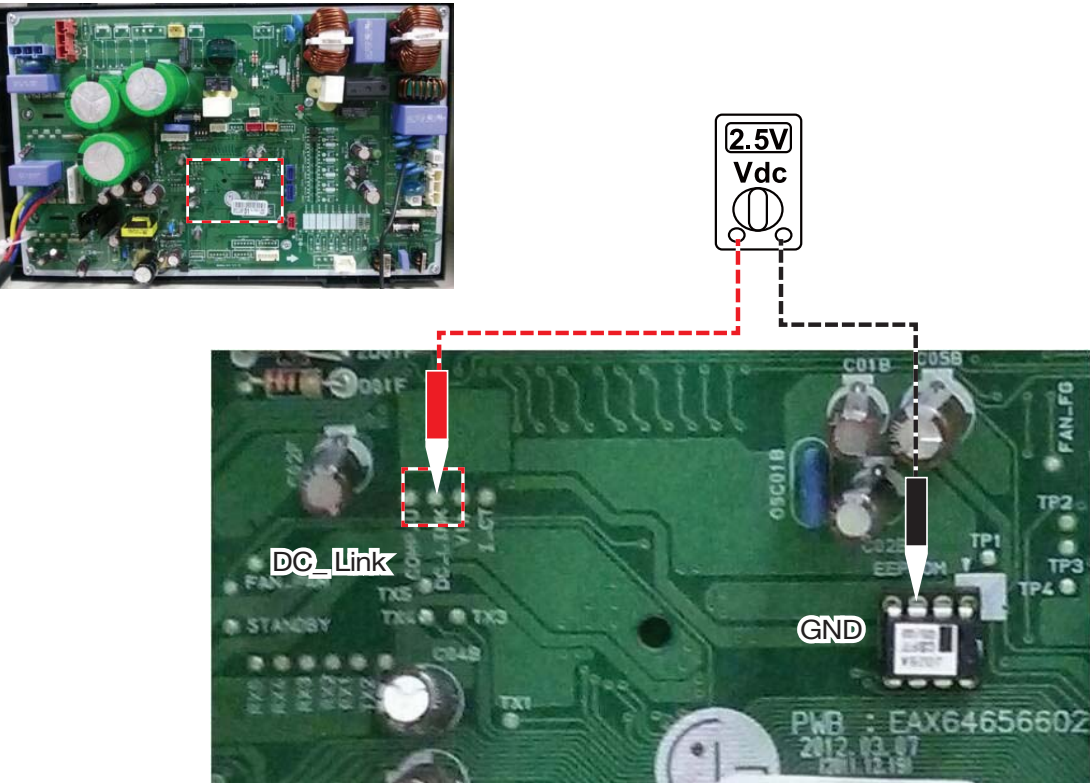
Checking method



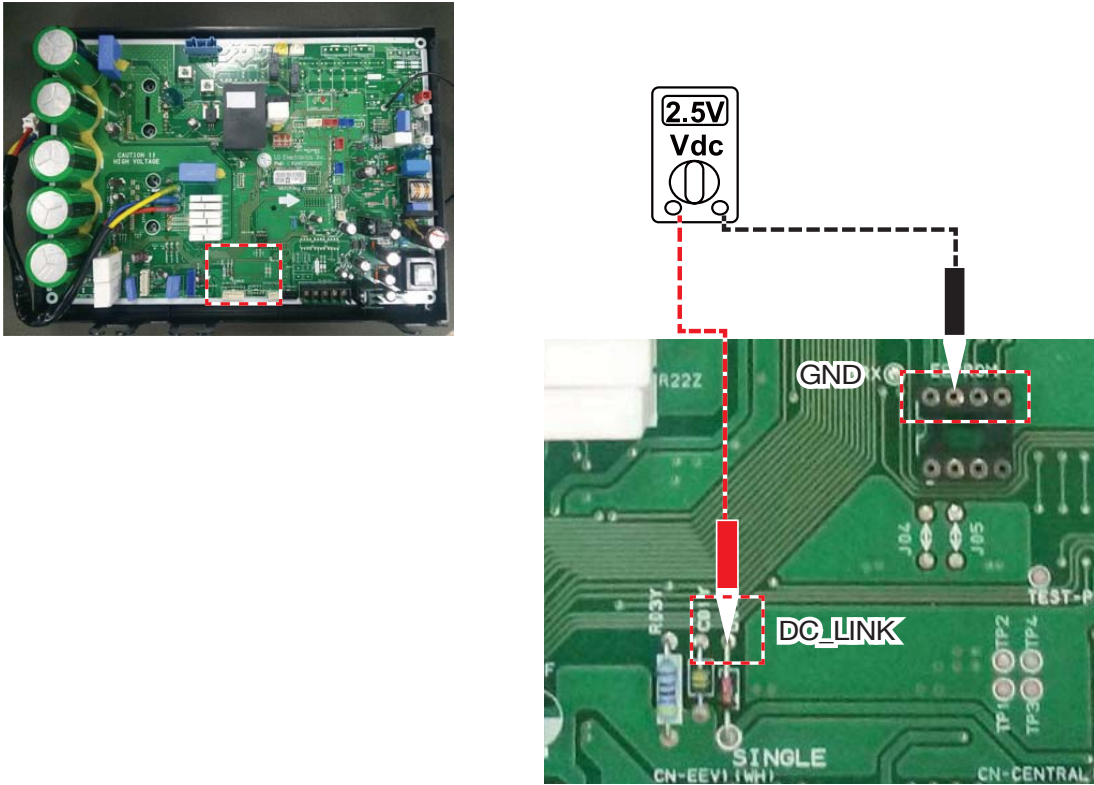
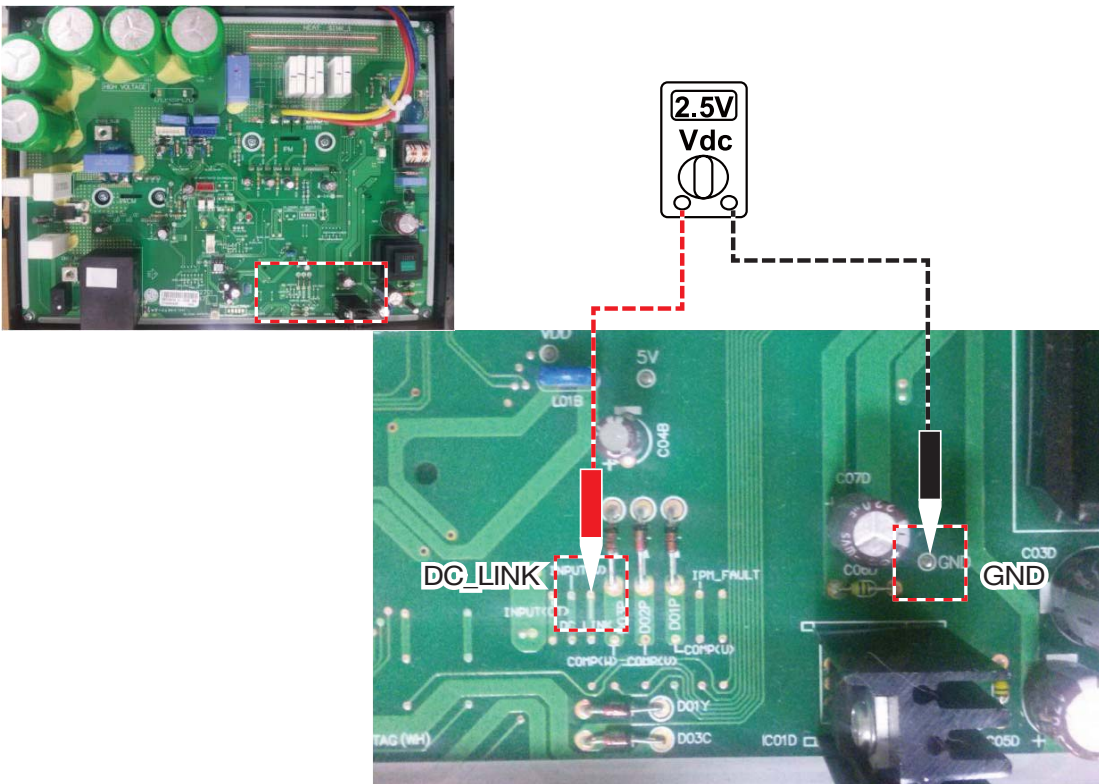
※ PCBA : PCB Assembly

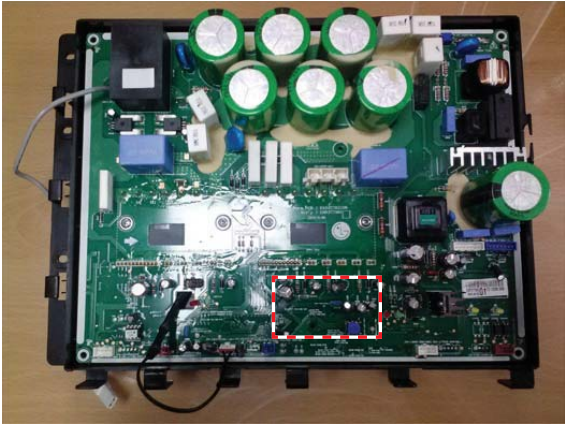
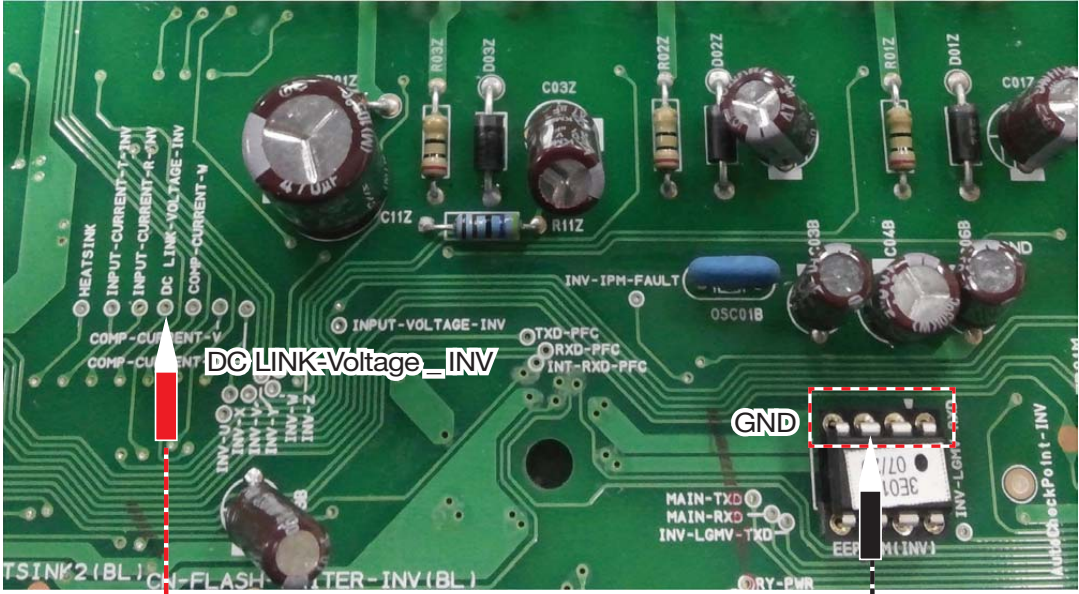
! Caution : When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

■ DC Link Detection Circuit Check Point

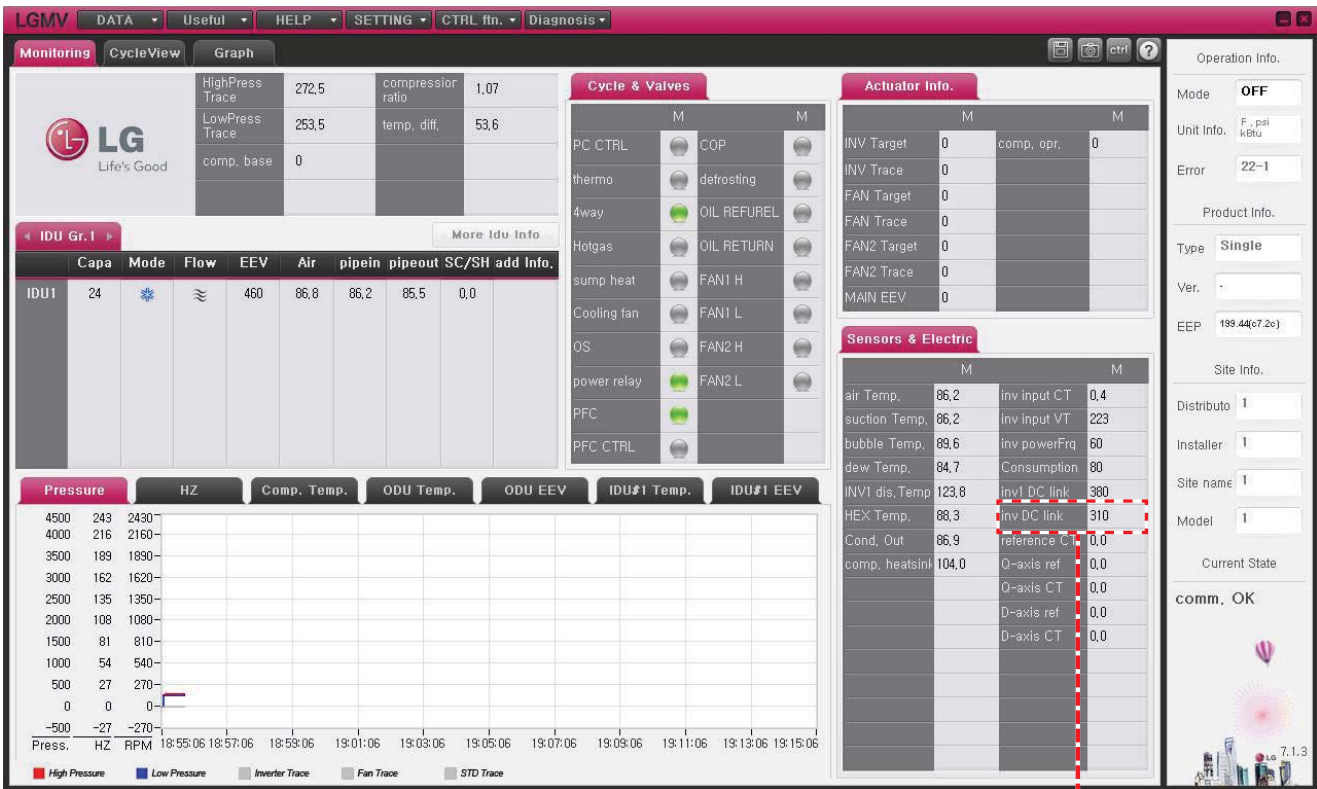
구분	DC Link Detection Circuit Check Point
2/2.5kW	
4kW	

4. Trouble Shooting

구분	DC Link Detection Circuit Check Point
5kW	 <p>The image shows a 5kW power supply board with a red dashed box highlighting the DC link detection area. A 2.5V Vdc source is connected to the DC_LINK pin and a GND pin on the board. The board is labeled with components like R22Z, J04, J05, TP1, TP2, TP3, TP4, CN-EEV1 (WH), and CN-CENTRAL.</p>
6kW	 <p>The image shows a 6kW power supply board with a red dashed box highlighting the DC link detection area. A 2.5V Vdc source is connected to the DC_LINK pin and a GND pin on the board. The board is labeled with components like L01B, C04B, C07D, C03D, INPUT1, INPUT2, COMPK(L), COMPC(L), D01P, D01Y, D03C, IC01D, and C05D.</p>

구분	DC Link Detection Circuit Check Point
7kW	  <p>DC LINK-Voltage_INV</p> <p>GND</p> <p>2.5V Vdc</p>

4. Trouble Shooting



inv DC link 310

DC Link NG Voltage level

Controller	Voltage
2~6kW	140V
7kW	380V

6.7 Troubleshooting Outdoor Error

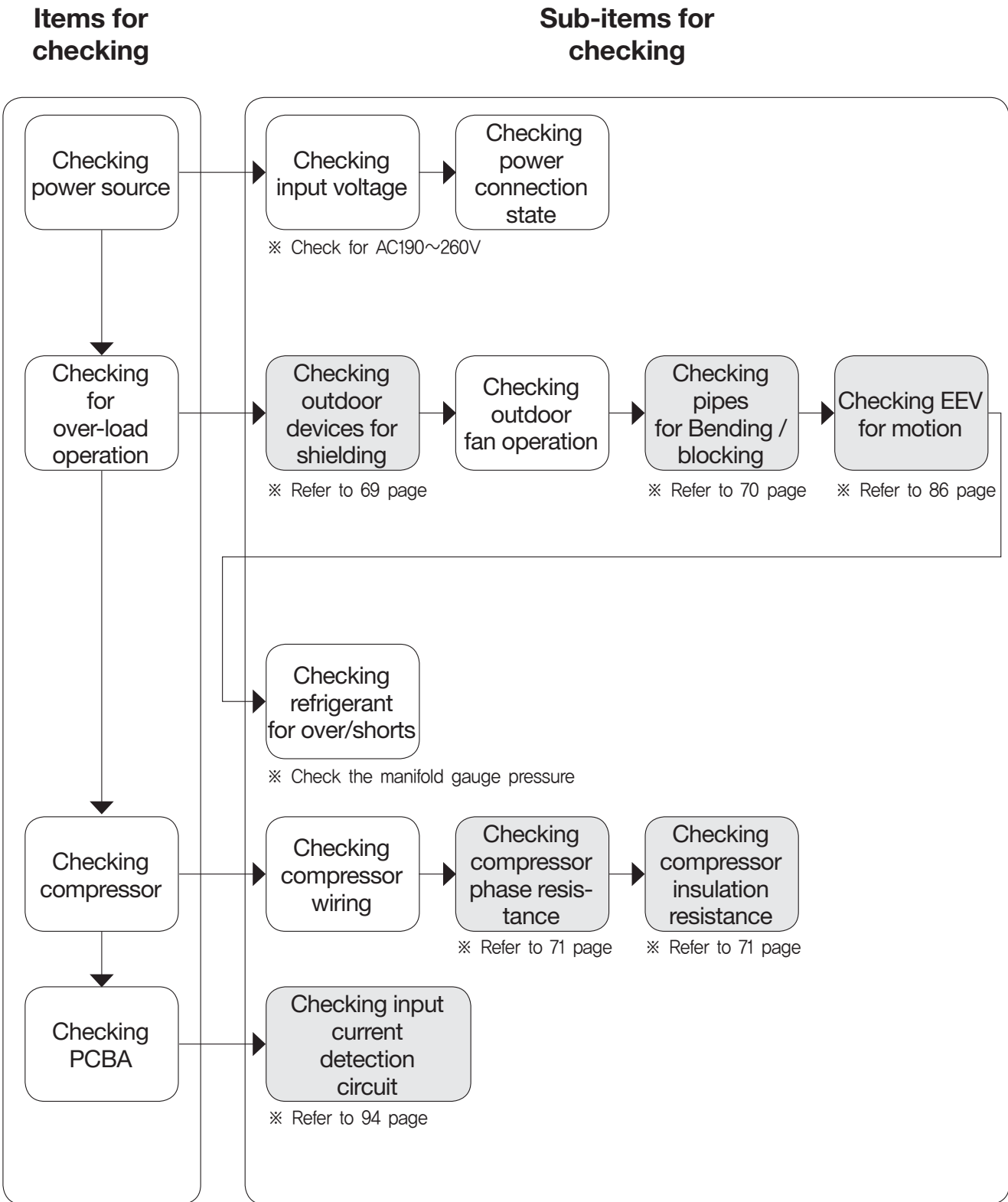
CH 22 (Input of Over Current)

Items		Contents
Purpose		Prevention of the damage of PCBA, wire, and connector caused by over-current
Condition for Generation		The detected current exceeds the standard.
Expected Causes	Installation & Overload	Installation fault, closing of SVC valve, under/over charging with refrigerant, infiltration of water into refrigerant, outdoor device shielding, outdoor fan fault, EEV valve fault, and sensor fault or assembling error.
	Compressor	Short between compressor coil and sash, abrasion of compressor, and short/opening of compressor coil.
	PCB Assembly	Input current detection circuit fault.
	Others	Input of low-voltage.

6.7 Troubleshooting Outdoor Error

CH 22 (Input of Over Current)

Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

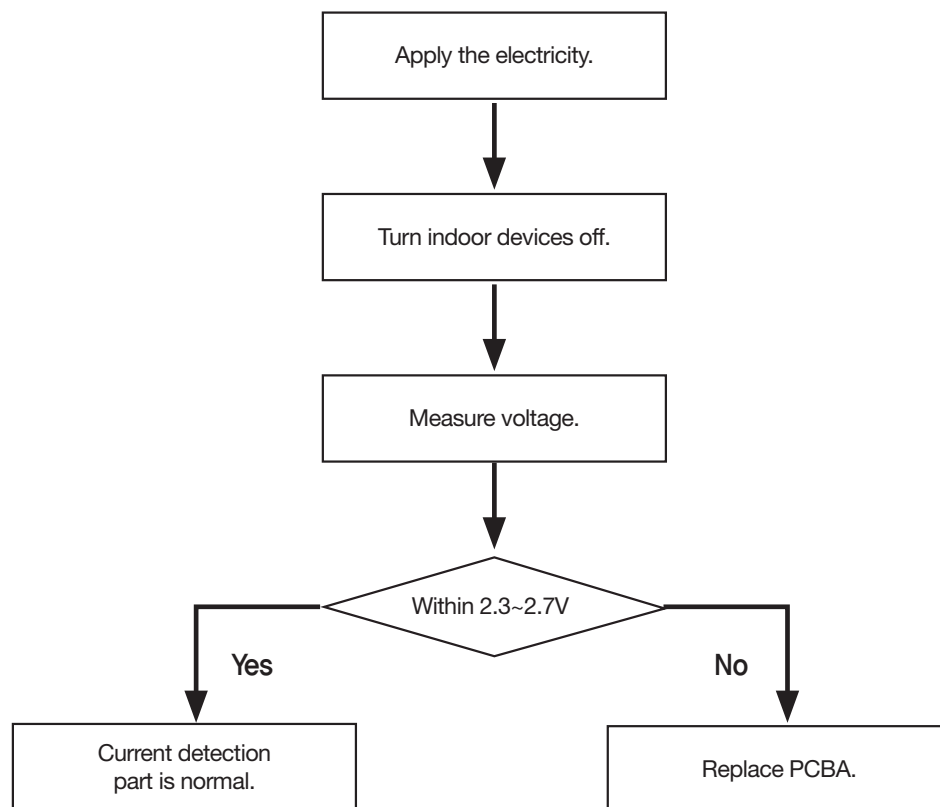
CH 22 (Input of Over Current)

Input Current Detection Circuit

Purpose	Generation of over-current caused by input current detection error.	Items for checking	1. Checking for current detection error
----------------	---	---------------------------	---

1. Set the tester in DC Voltage Mode and check the current.
2. Check the current between IN/I and Micom_GND.
3. The standard of normal voltage measurement is $2.5V \pm 0.2V$.
4. If the measurement is different from the standard, replace PCBA.

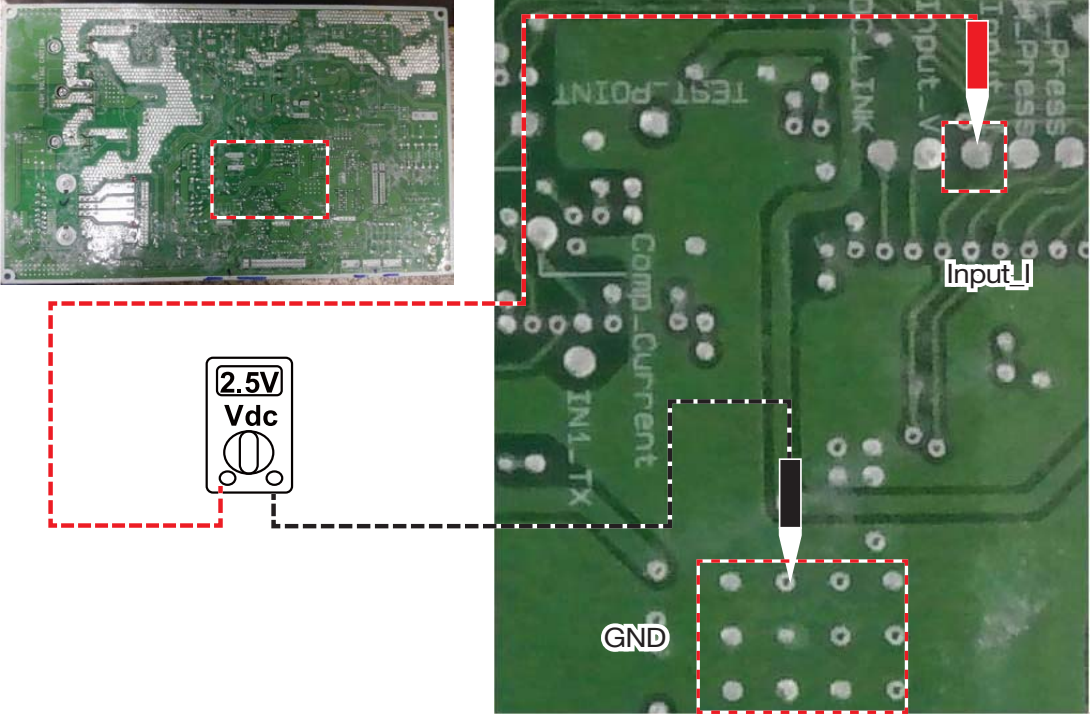
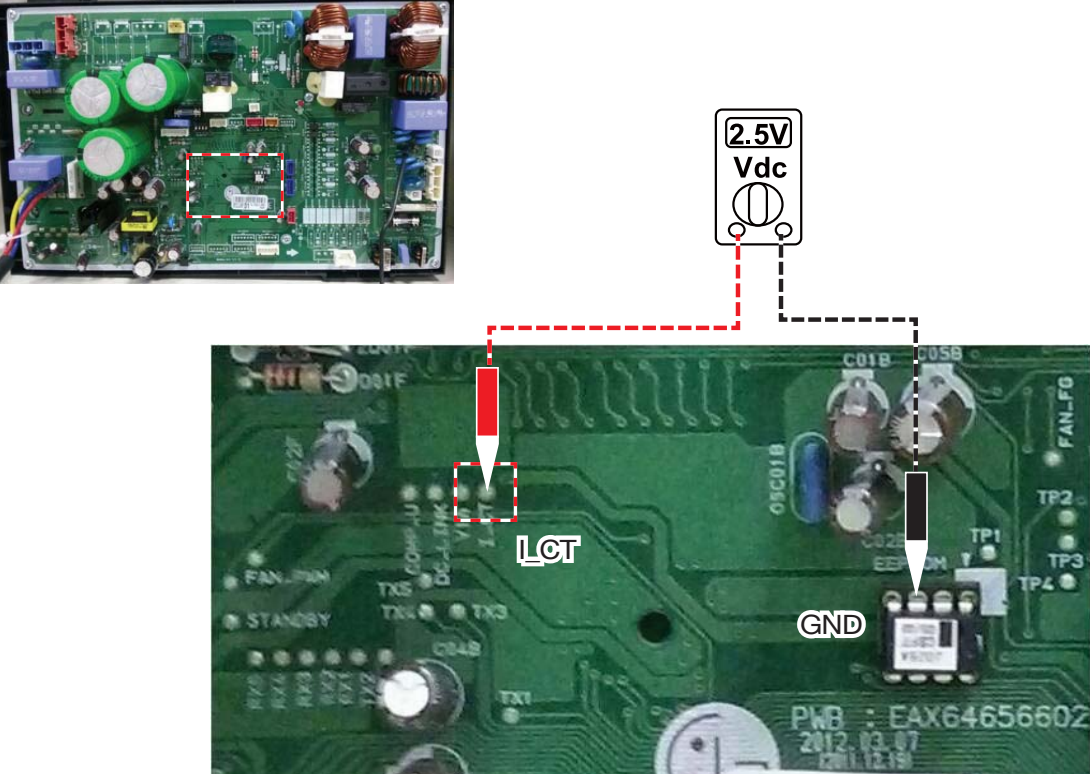
Checking method

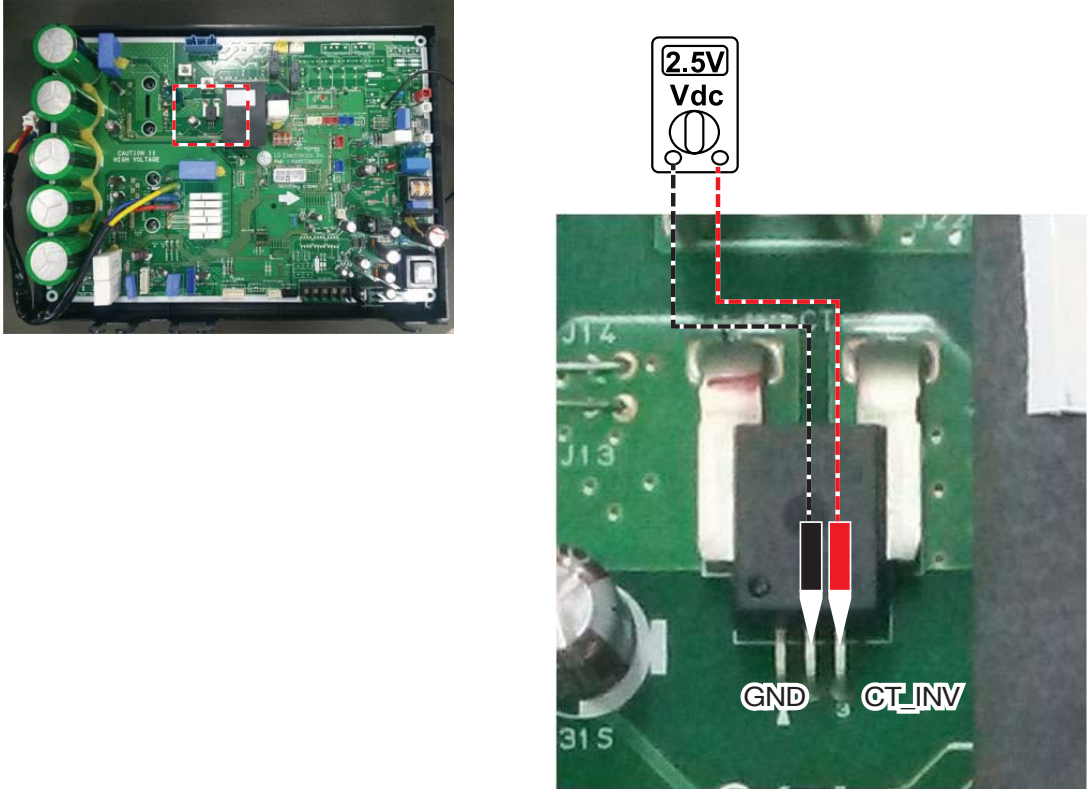
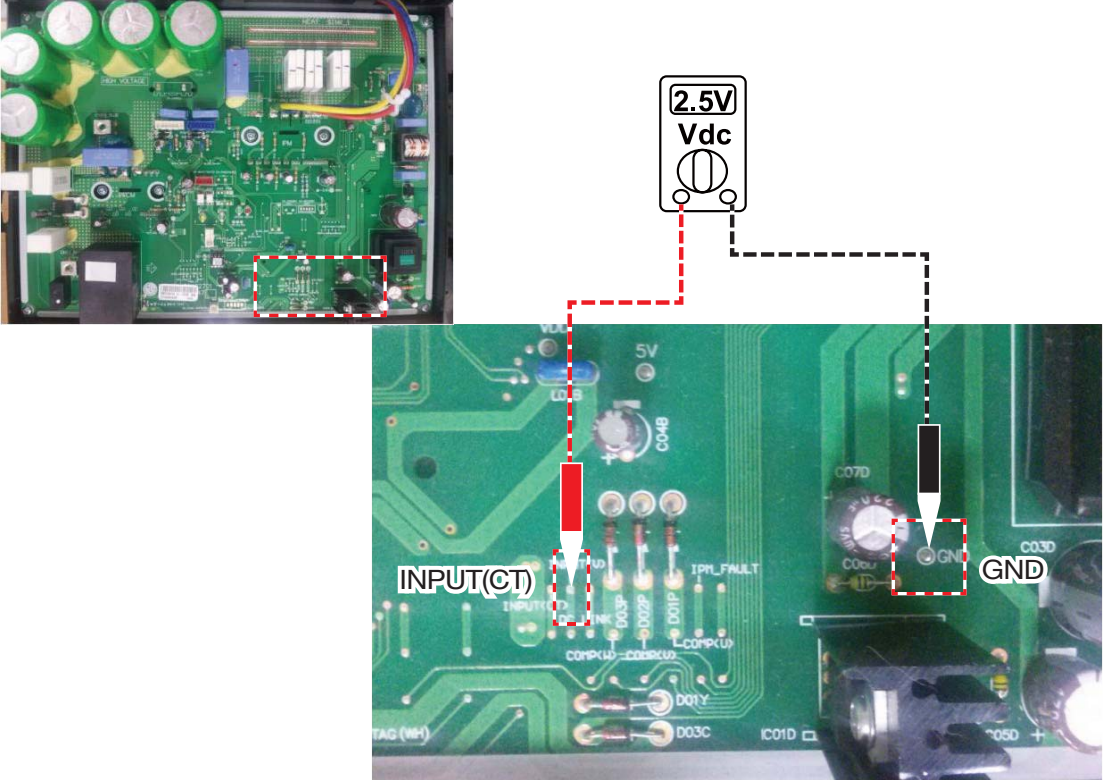



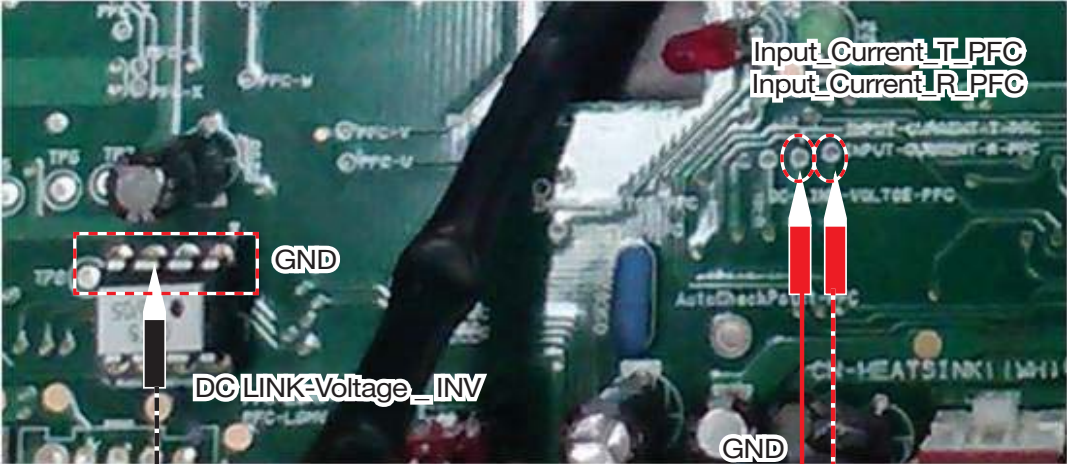
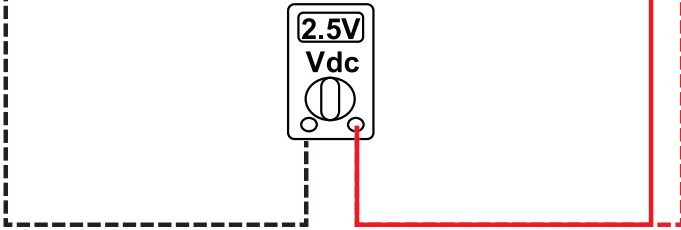
※ PCBA : PCB Assembly

! Caution : When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

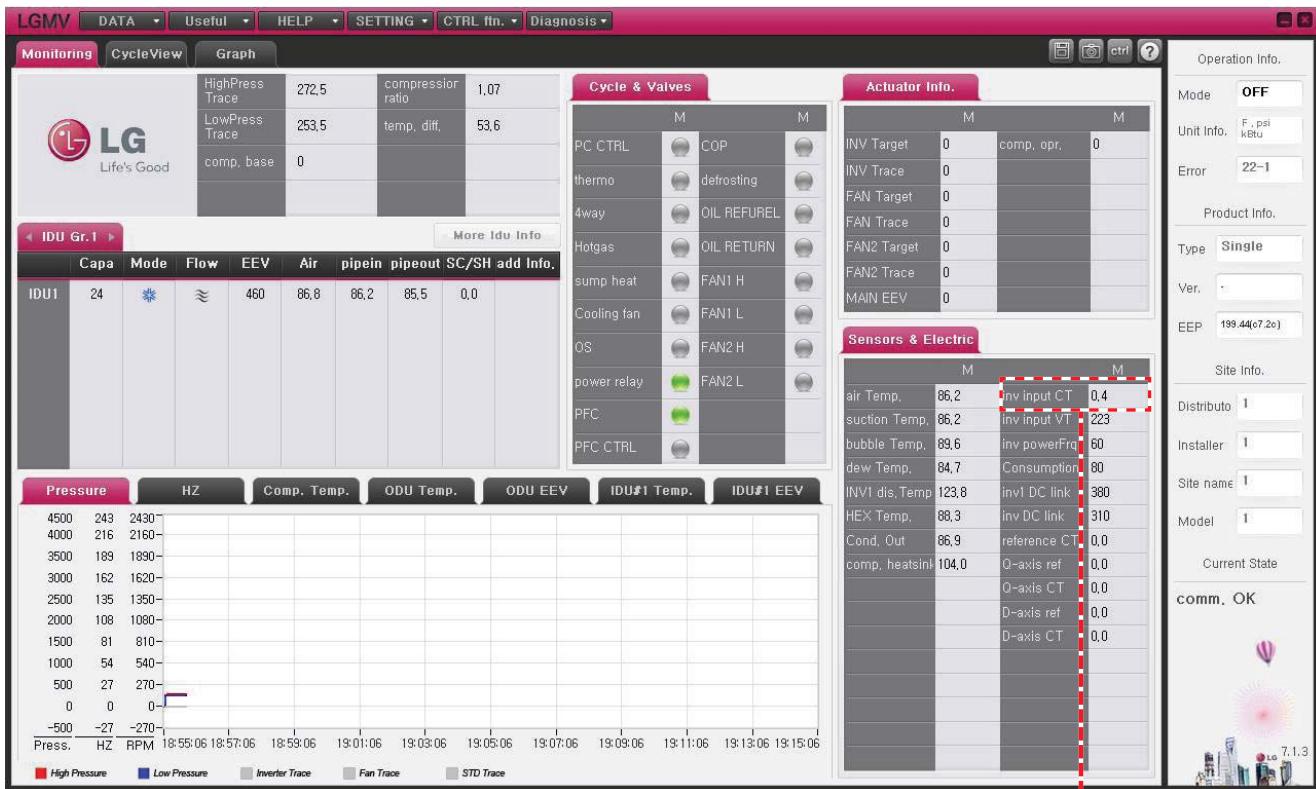
4. Trouble Shooting

구분	Input Current Detection Point
2/2.5kW	 <p>TEST_POINT</p> <p>Comp_Current</p> <p>IN1_TX</p> <p>GND</p> <p>Input_I</p> <p>2.5V Vdc</p>
4kW	 <p>OSC01B</p> <p>C01B</p> <p>C05B</p> <p>FAN-FG</p> <p>TP2</p> <p>TP3</p> <p>TP4</p> <p>PWB : EAX6465660Z</p> <p>2012.03.07</p> <p>2011.12.19</p> <p>LOT</p> <p>GND</p> <p>2.5V Vdc</p>

구분	Input Current Detection Point
5kW	 <p>The diagram for the 5kW unit shows a top-down view of the PCB with a red dashed box highlighting the current transformer (CT) area. A close-up view shows a 2.5V Vdc voltmeter connected between the GND and CT_INV pins of the CT component. The CT_INV pin is marked with a red stripe.</p>
6kW	 <p>The diagram for the 6kW unit shows a top-down view of the PCB with a red dashed box highlighting the current transformer (CT) area. A close-up view shows a 2.5V Vdc voltmeter connected between the INPUT(CT) and GND pins. The INPUT(CT) pin is marked with a red stripe.</p>

구분	Input Current Detection Point
7kW	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>4kW</p> </div> <div style="text-align: center;">  </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>2.5V Vdc</p> </div>

■ LGMV Display



inv input CT 0.4

CH22 error condition

Controller	Current Level
2kW	9A ↑
2.5kW	11A ↑
4kW	19A ↑
5kW	29A ↑
6kW	29A ↑
7kW	13A ↑

6.7 Troubleshooting Outdoor Error

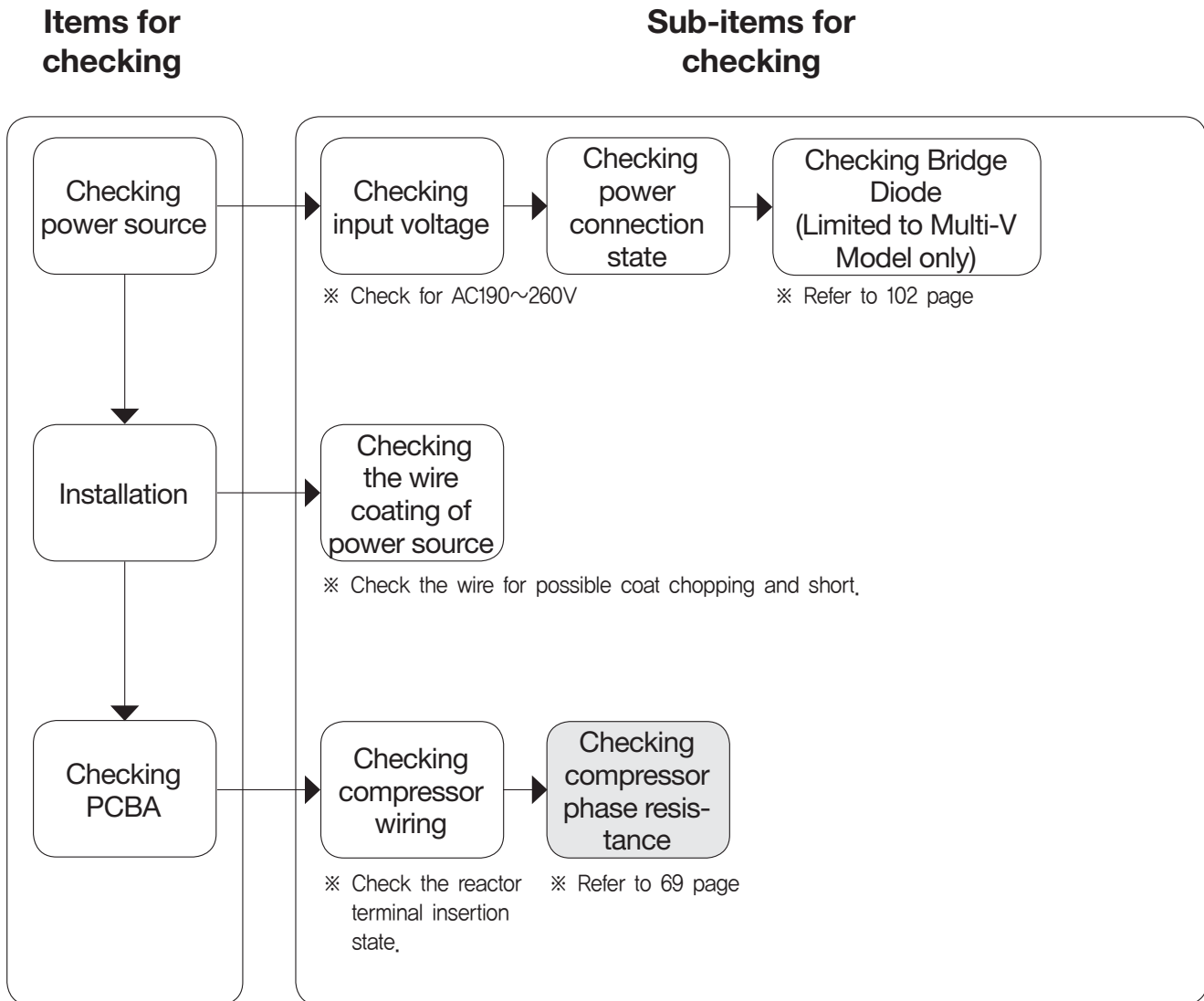
CH 23 (DC Link Voltage Low)

Items		Contents
Purpose		Securing the credibility of the compressor lifetime against the generation of over-current at the compressor part in the DC Link Low Voltage condition.
Condition for Generation		Detected DC Link Voltage is less than the standard.
Expected Causes	Installation	Installation fault and input of low-voltage power
	PCB Assembly	Damage of DC link voltage detection circuit and reactor terminal connection error

6.7 Troubleshooting Outdoor Error

CH 23 (DC Link Voltage Low)




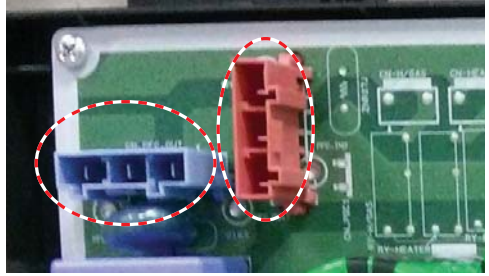
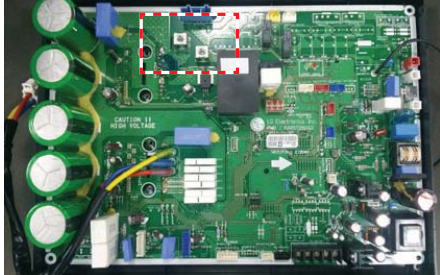
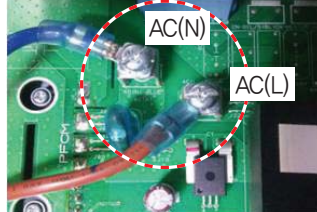

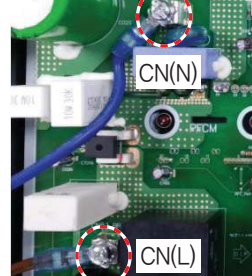
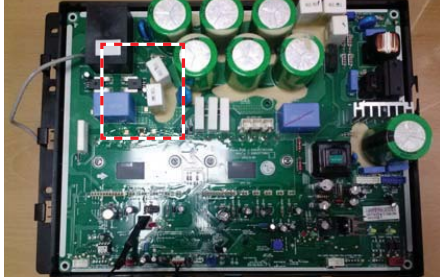
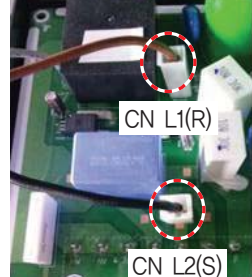
Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

CH 23 (DC Link Voltage Low)

Checking Reactor Connection

구분	Reactor Connector Point	
2/2.5kW		
4kW		
5kW		 <p data-bbox="893 1255 1380 1308">Brown Wire is connected AC(L) Terminal. Blue Wire is connected AC(N) Terminal.</p>
6kW		 <p data-bbox="1153 1351 1380 1436">Brown Wire is connected CN(L) Terminal.</p> <p data-bbox="1153 1457 1380 1542">Blue Wire is connected CN(N) Terminal.</p>
7kW		 <p data-bbox="1153 1670 1380 1776">Brown Wire is connected CN L1(R) Terminal.</p> <p data-bbox="1153 1808 1380 1925">Black Wire is connected CN L2(S) Terminal.</p>

6.7 Troubleshooting Outdoor Error

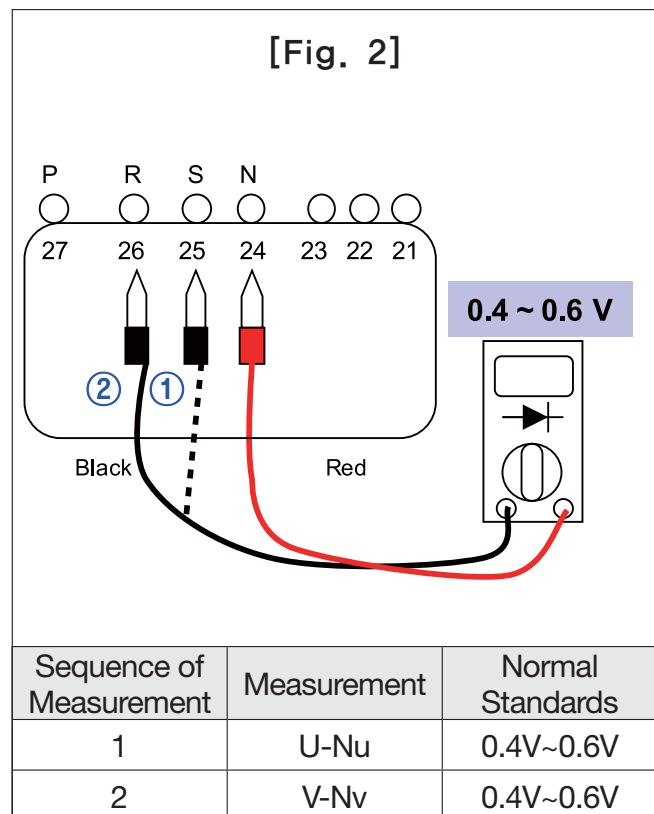
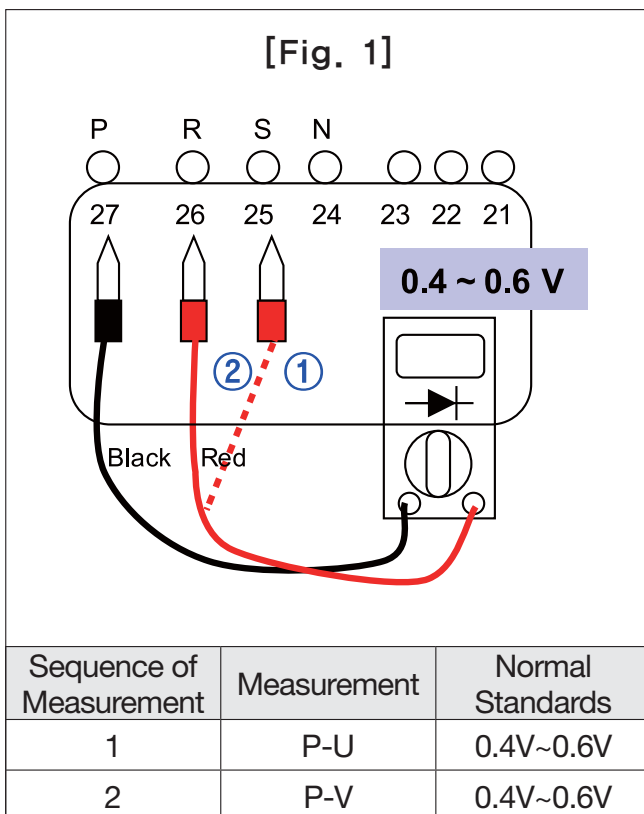
CH 23 (DC Link Voltage Low)

Checking PFCM (PCBA : 4,5,6kW)

Purpose	Checking Bride Diode parts for fault.	Items for checking	1. Checking PFCM for damage
----------------	---------------------------------------	---------------------------	-----------------------------

■ How to check PFCM IGBT (Diode Mode)

1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. (\rightarrow)
3. Measure the voltage as shown in Fig. 1.
4. Measure the voltage as shown in Fig. 2.
5. If the measurements are significantly different from the levels shown in the figures, the PFCM is deemed to be damaged.



6.7 Troubleshooting Outdoor Error

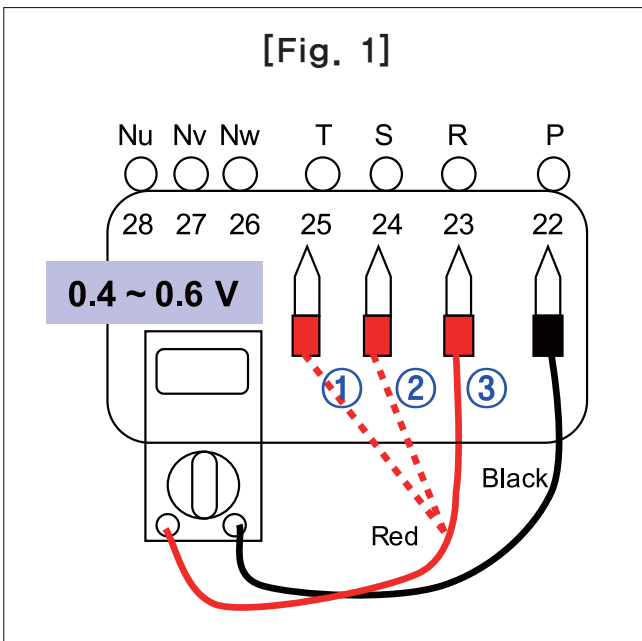
CH 23 (DC Link Voltage Low)

Checking PFCM (PCBA : 7kW)

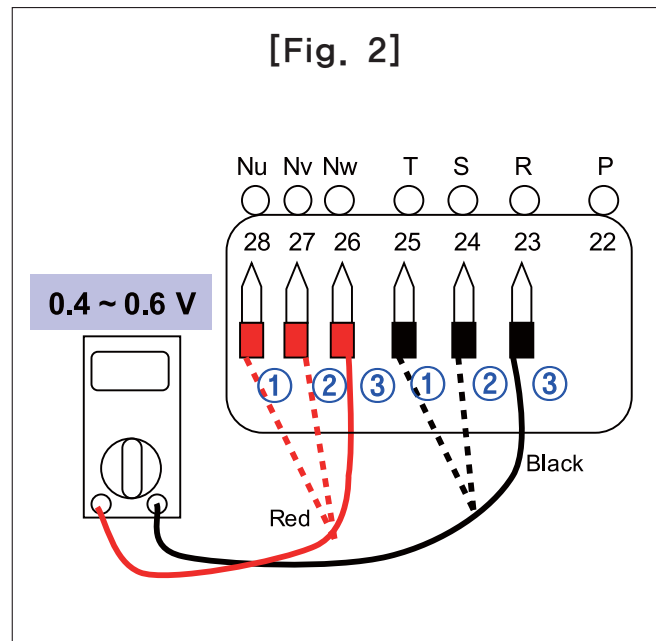
Purpose	Checking Bride Diode parts for fault,	Items for checking	1. Checking PFCM for damage
----------------	---------------------------------------	---------------------------	-----------------------------

■ How to check PFCM IGBT (Diode Mode)

1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. (\rightarrow)
3. Measure the voltages of P~R / P~S / P~T as shown in Fig. 1.
4. Measure the voltages of T~Nu / S~Nv / R~Nw as shown in Fig. 2.
5. If the measurements are significantly different from the levels shown in the figures, the IPM is deemed to be damaged.

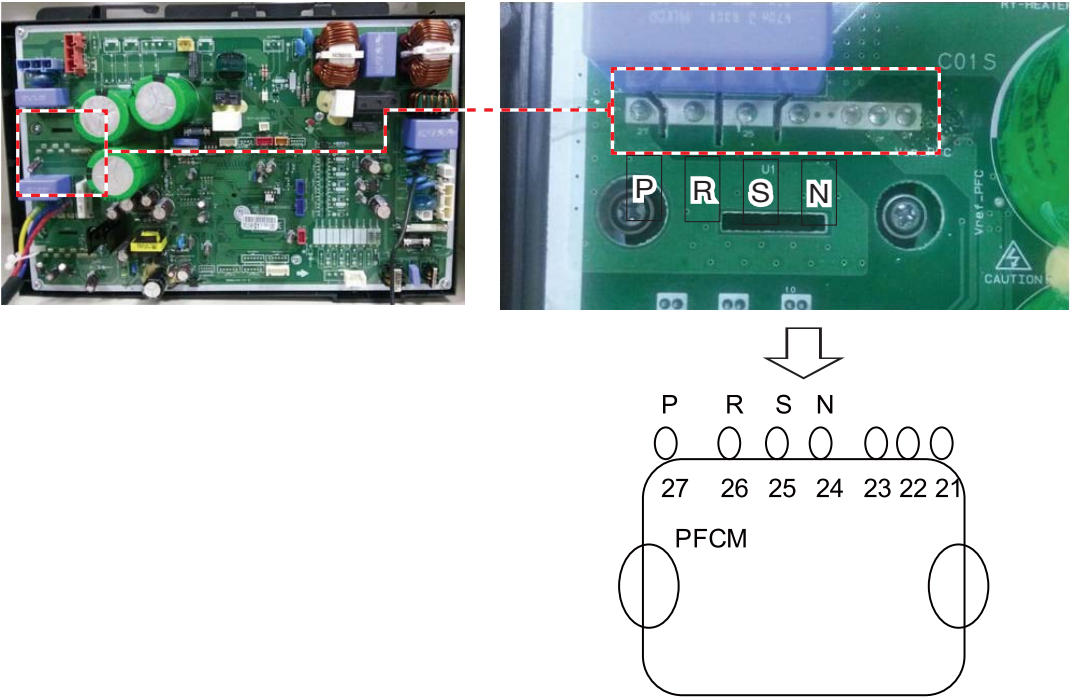
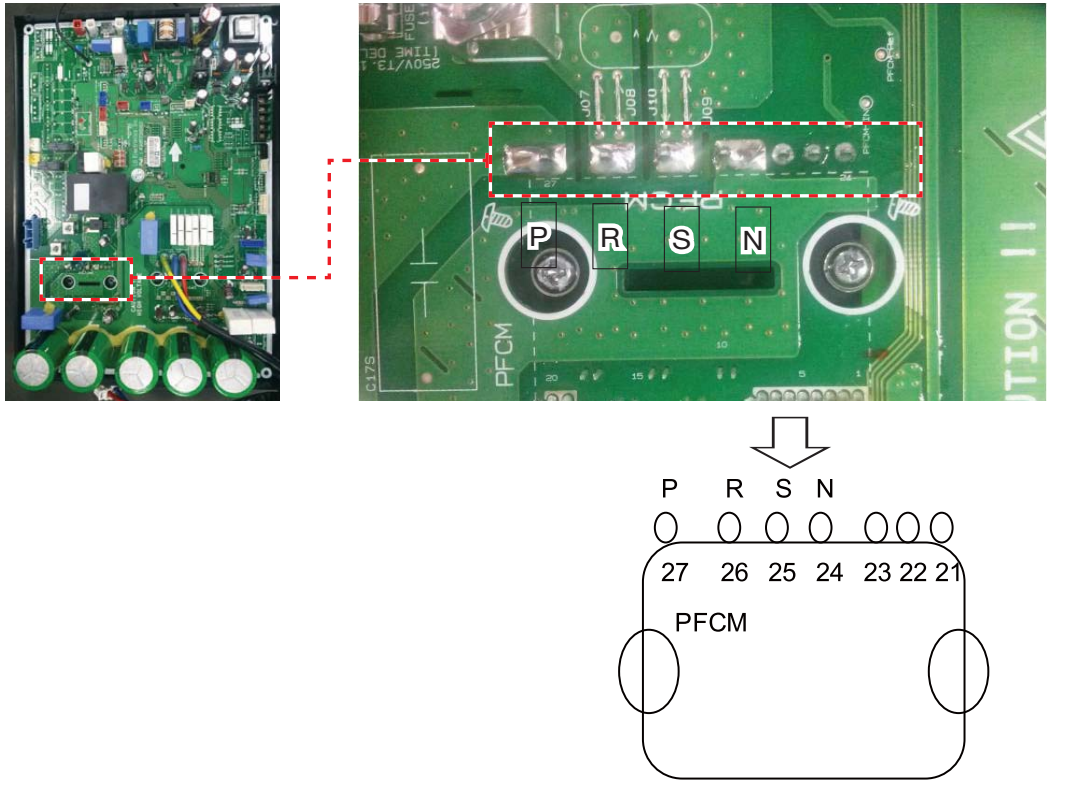


Sequence of Measurement	Measurement	Normal Standards
1	P-U	0.4V~0.6V
2	P-V	0.4V~0.6V
3	P-W	0.4V~0.6V

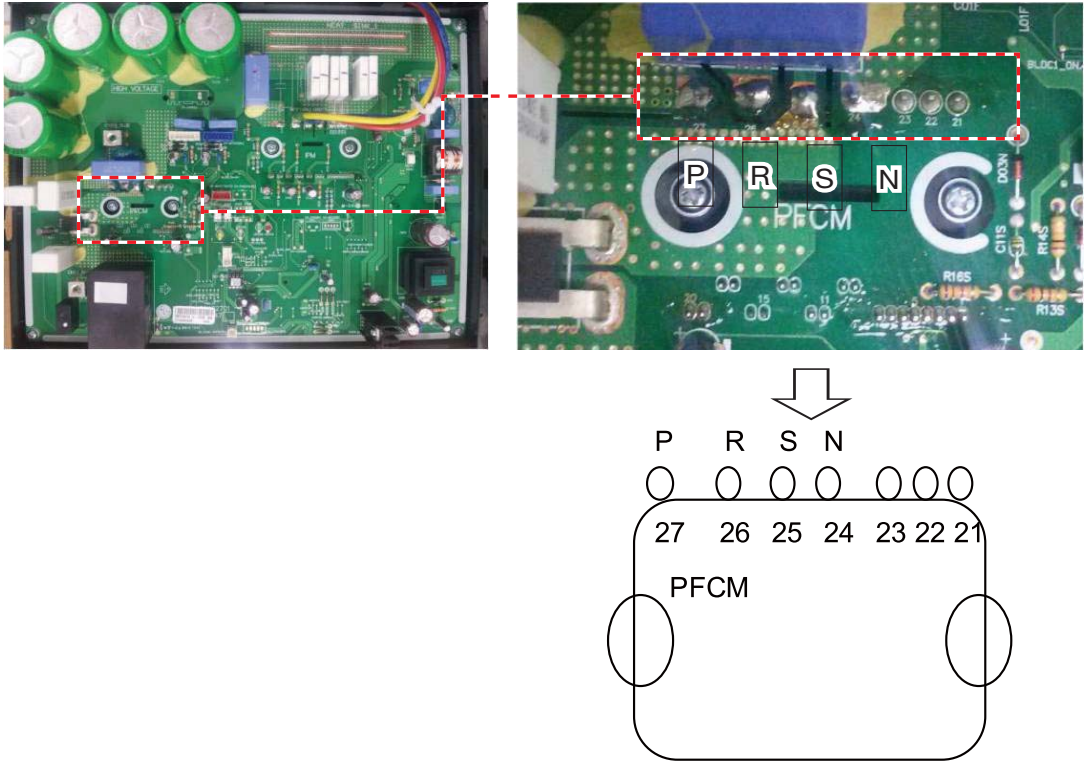
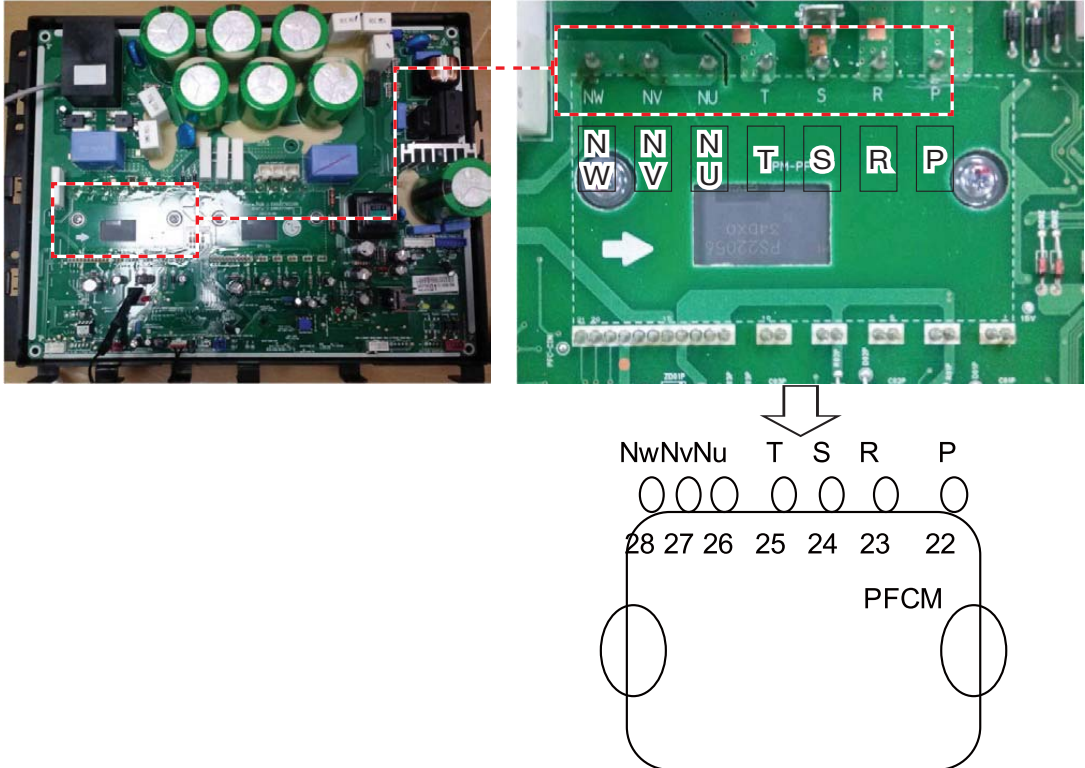


Sequence of Measurement	Measurement	Normal Standards
1	U-Nu	0.4V~0.6V
2	V-Nv	0.4V~0.6V
3	W-Nw	0.4V~0.6V

■ PFCM Point

구분	PFCM Point
4kW	 <p>[PFCM Pin Arrangement and Pin Numbers]</p>
5kW	 <p>[PFCM Pin Arrangement and Pin Numbers]</p>

■ PFCM Point

구분	IPM Check Point
6kW	 <p>The image shows two photographs of a 6kW PFCM circuit board. The left photo is a wide shot with a red dashed box highlighting the PFCM area. The right photo is a close-up of the PFCM area, with a red dashed box around the pins. Below the photos is a schematic diagram of the PFCM pin arrangement. The pins are labeled P, R, S, N from left to right, with two empty pins to the right. The pin numbers 27, 26, 25, 24, 23, 22, 21 are listed below the pins. The label 'PFCM' is centered below the pin numbers. An arrow points down from the close-up photo to the schematic.</p> <p>[PFCM Pin Arrangement and Pin Numbers]</p>
7kW	 <p>The image shows two photographs of a 7kW PFCM circuit board. The left photo is a wide shot with a red dashed box highlighting the PFCM area. The right photo is a close-up of the PFCM area, with a red dashed box around the pins. Below the photos is a schematic diagram of the PFCM pin arrangement. The pins are labeled Nw, Nv, Nu, T, S, R, P from left to right. The pin numbers 28, 27, 26, 25, 24, 23, 22 are listed below the pins. The label 'PFCM' is centered below the pin numbers. An arrow points down from the close-up photo to the schematic.</p> <p>[PFCM Pin Arrangement and Pin Numbers]</p>

6.7 Troubleshooting Outdoor Error

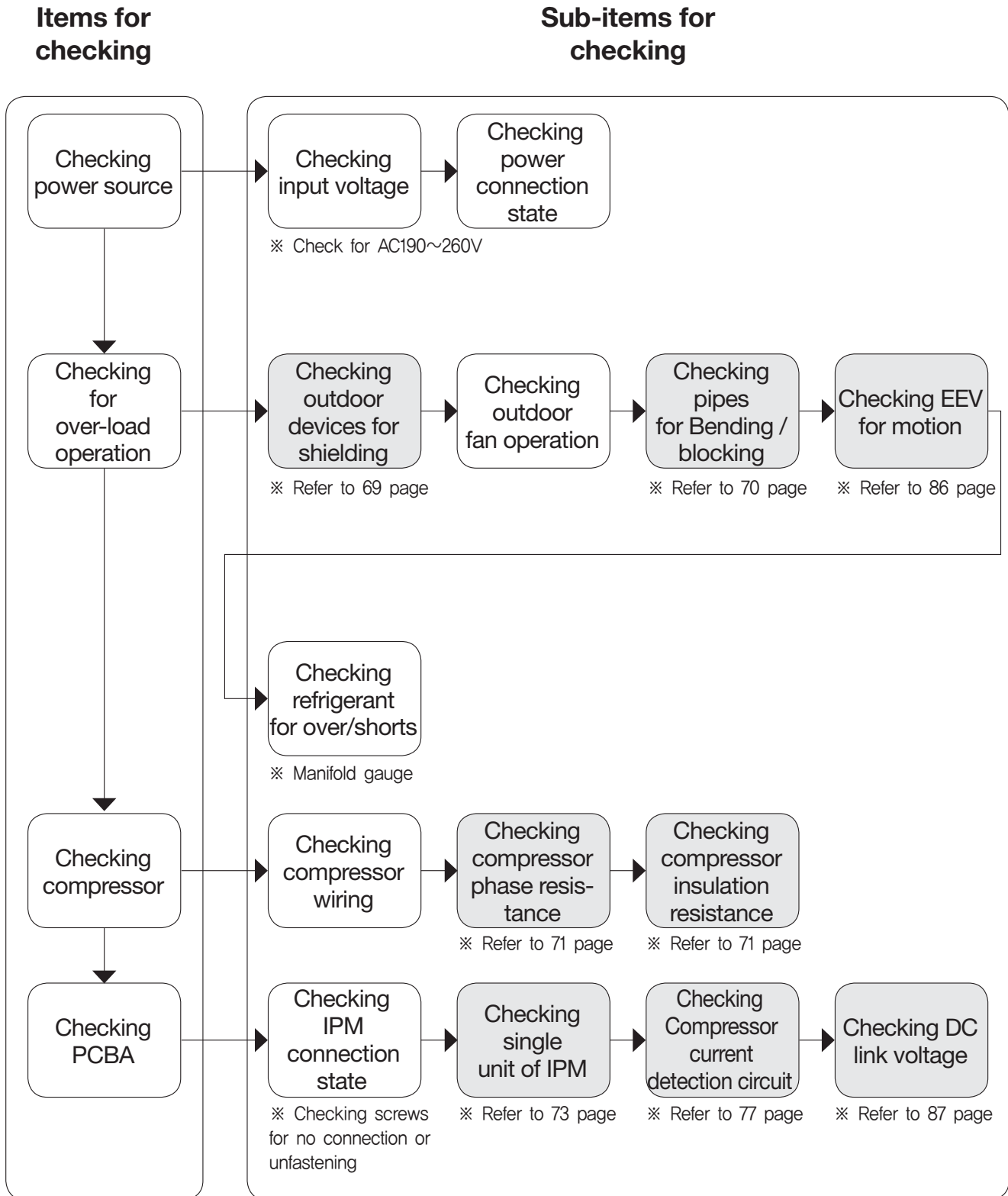
CH 26 (Compressor Starting Failure)

Items		Contents
Purpose		Restarting of the compressor when it does not properly work.
Condition for Generation		① The compressor current exceeds the standard at initial starting. ② The compressor current does not reach the standard at initial starting. ③ The compressor frequency does not reach the standard at initial starting.
Expected Causes	Installation & Overload	Closing of SVC valve, under/over charging with refrigerant, infiltration of water into refrigerant, outdoor device shielding, outdoor fan fault, EEV valve fault, and sensor fault or assembling error
	Compressor	Open/Short of the coil in the compressor, insulation breaking between the coil in the compressor and the sash, damage of compressor with abrasion, and compressor connection fault
	PCB Assembly	IPM parts fault, compressor current detection circuit fault, and DC link detection circuit fault
	Others	Input of abnormal power, IPM connection fault, and power connection fault

6.7 Troubleshooting Outdoor Error

CH 26 (Compressor Starting Failure)

Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

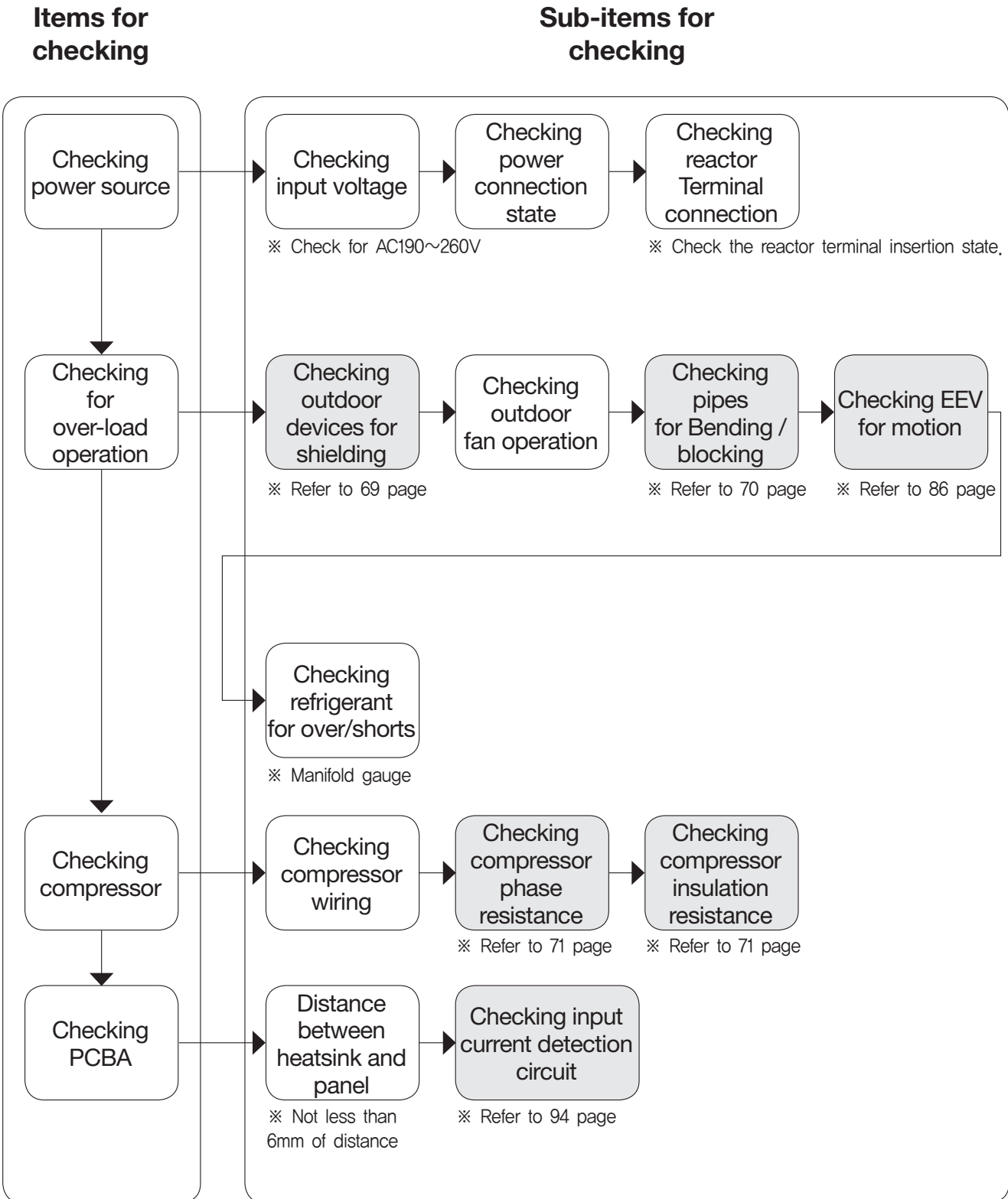
CH 27/73 (PSC/PFC Fault Error)

Items		Contents
Purpose		Prevention of the damage of PCBA, wire, and connector caused by over-current
Condition for Generation		Transfer of signals with detection of the flow of over-current in PSC/PFC
Expected Causes	Installation & Overload	Transfer of signals with detection of the flow of over-current in PSC/PFC, Outdoor device shielding
	Compressor	Open/Short of the coil in the compressor, insulation breaking between the coil in the compressor and the sash, damage of compressor with abrasion, and compressor connection fault
	PCB Assembly	Damage of PSCM/PFCM and input current detection circuit fault
	Others	Input of abnormal power, power connection fault, reactor terminal connection fault, and faulty distance between heatsink and sash

6.7 Troubleshooting Outdoor Error

CH 27/73 (PSC/PFC Fault Error)

Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

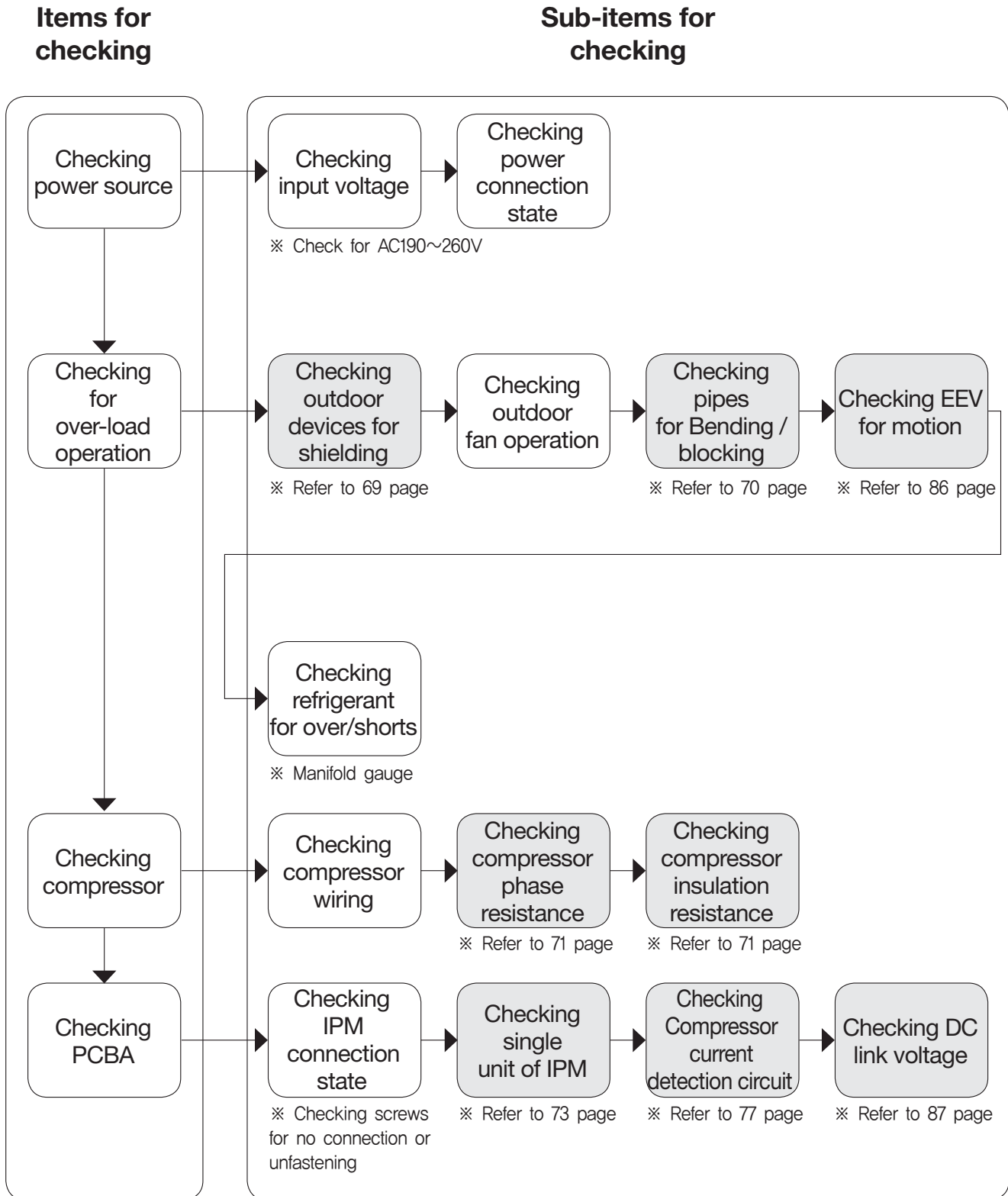
CH 29 (Compressor Over Current)

Items		Contents
Purpose		Protection of IPM and compressor in the PCB assembly from over-current.
Condition for Generation		Increased compressor current exceeding the standard.
Expected Causes	Installation & Overload	Transfer of signals with detection of the flow of over-current in PSC/PFC, blocking of a outdoor unit.
	Compressor	Open/Short of the coil in the compressor, insulation breaking between the coil in the compressor and the sash, damage of compressor with abrasion, and compressor connection fault
	PCB Assembly	Compressor current detection circuit fault, DC link detection circuit fault, and fault of single unit of IPM
	Others	Input of abnormal power and power connection fault

6.7 Troubleshooting Outdoor Error

CH 29 (Compressor Over Current)

Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

CH 32 (Discharge pipe overheating error of Inverter)

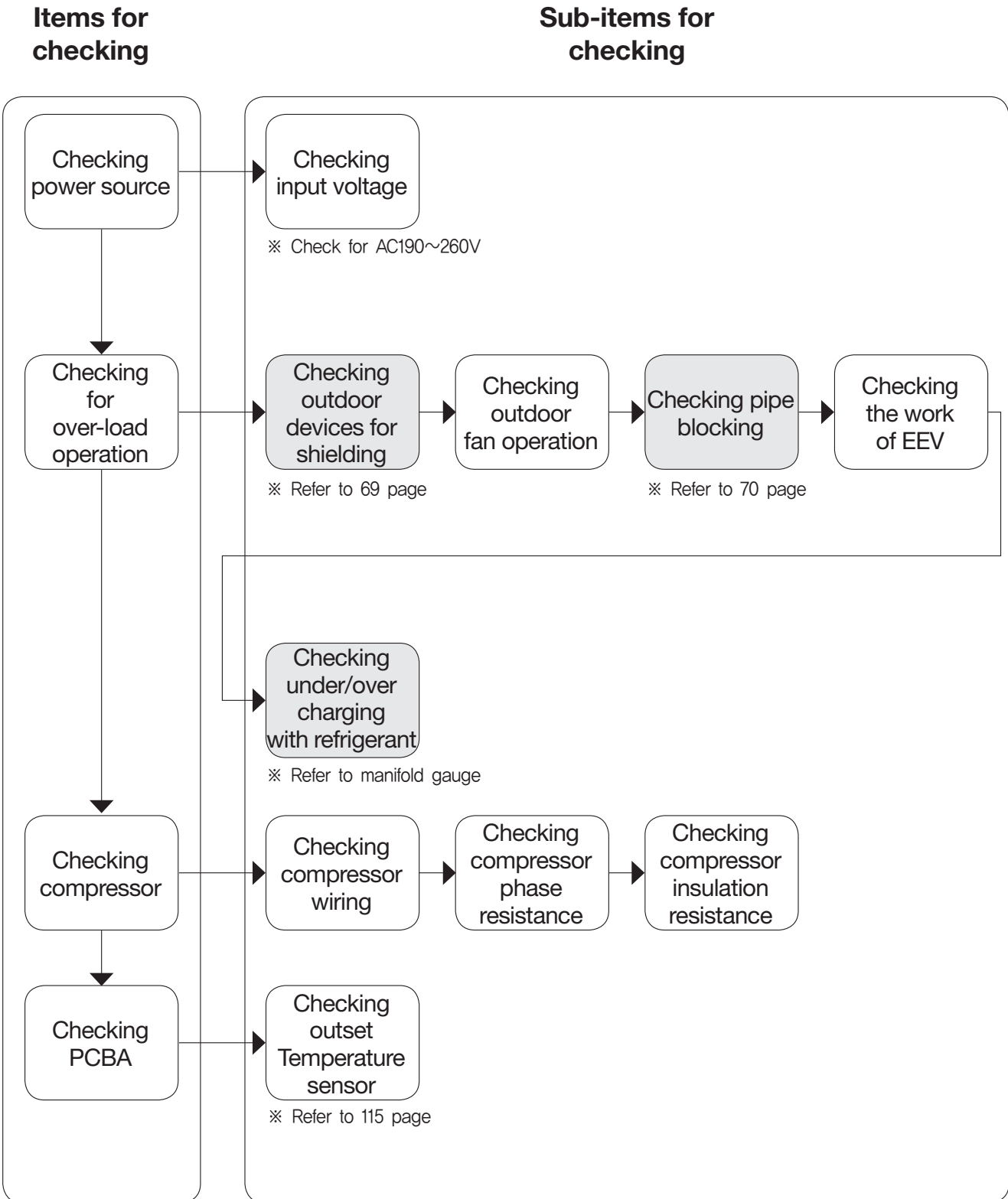
Items		Contents
Purpose		Possible damage of compressor and piping due to high discharge temperature
Condition for Generation		The discharge temperature is elevated exceeding the standard.
Expected Causes	Installation	Installation fault, closing of SVC valve, under/over charging with refrigerant, and infiltration of moisture into refrigerant
	Overload	Outdoor device shielding, outdoor fan fault, and EEV valve fault
	Compressor	Short between compressor coil and sash, abrasion of compressor, and short/opening of compressor coil
	PCB Assembly	Compressor current and DC link voltage detection circuit fault
	Sensor	Discharge temperature sensor fault

※ IPM (Intelligent Power Module) : The part to control the inverter compressor

6.7 Troubleshooting Outdoor Error

CH 32 (Discharge pipe overheating error of Inverter)

Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

Checking Temperature Sensor Open/Short

Items	Contents
Purpose	Prevention of reception of wrong temperature value from the temperature sensor
Condition for Generation	Damage of temperature sensor (Short / Open)

■ Cause of Temperature Sensor Error

Classification	Causes in Detail
PCB Assembly	Connector open, damaged insulation of sash, damage of the wire coating of temperature sensors

Code No.	Details of Errors
41	Inverter Discharge temperature sensor Open/Short
43	High pressure Sensor Error
44	Outdoor air temperature sensor Open/Short
45	Outdoor piping temperature sensor Open/Short
46	Outdoor suction temperature sensor Open/Short
47	Constant rate outlet temperature sensor Open/Short

1. Uses of sensors
 - : Control of compressor and cycle
2. Kinds of Sensors (See corresponding pages)
 - Outlet : $200\text{K}\Omega \pm 10\%$
 - Piping : $5\text{K}\Omega \pm 10\%$
 - Air : $10\text{K}\Omega \pm 10\%$
 - (Based on 25°C of surrounding temperature)
3. Sensor insulation resistance
 - : The resistance between the sash and sensor terminal should be not less than $1\text{M}\Omega$.

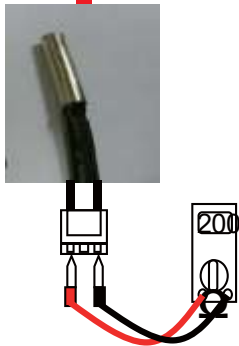
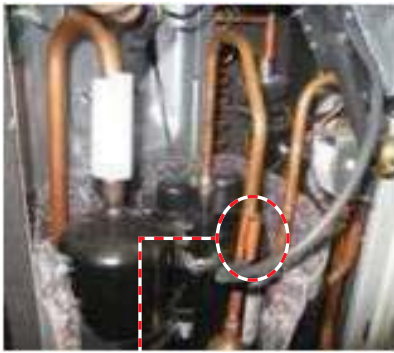
6.7 Troubleshooting Outdoor Error

Sensor Checking Methods

Purpose	Checking single units of sensors for fault	Items for checking	Measurement of the unique resistance by sensor temperature.
---------	--	--------------------	---

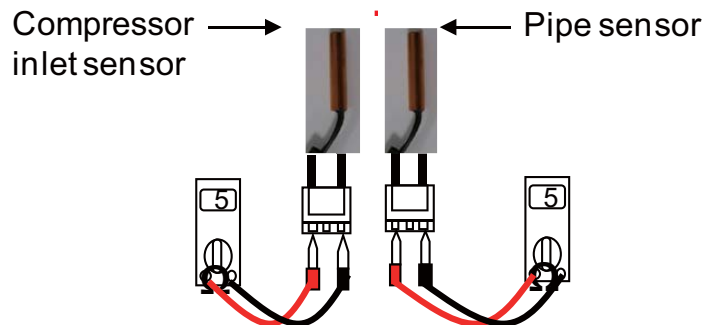
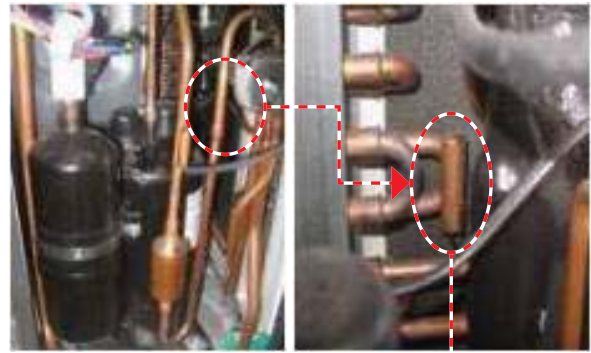
① Compressor discharge sensor

- Position : Outlet of compressor
- Sensor value : $200k\Omega \pm 10\%$
(Based on 25°C)



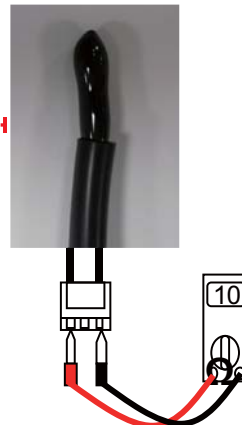
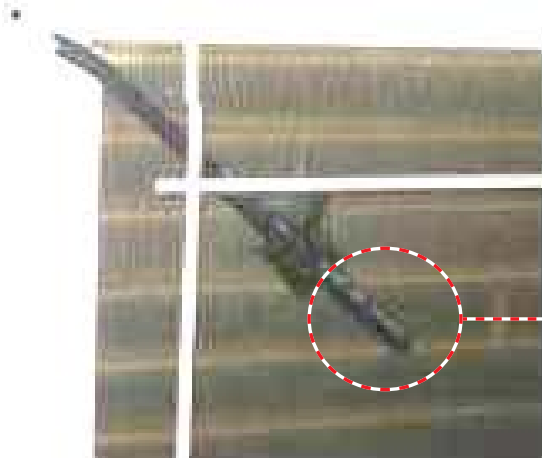
② Pipe sensor

- Position : Compressor inlet and pipe
- Sensor value : $5k\Omega \pm 10\%$
(Based on 25°C)



③ Outdoor temperature sensor

- Position : Rear part of outdoor device
- Sensor value : $10k\Omega \pm 10\%$
(Based on 25°C)

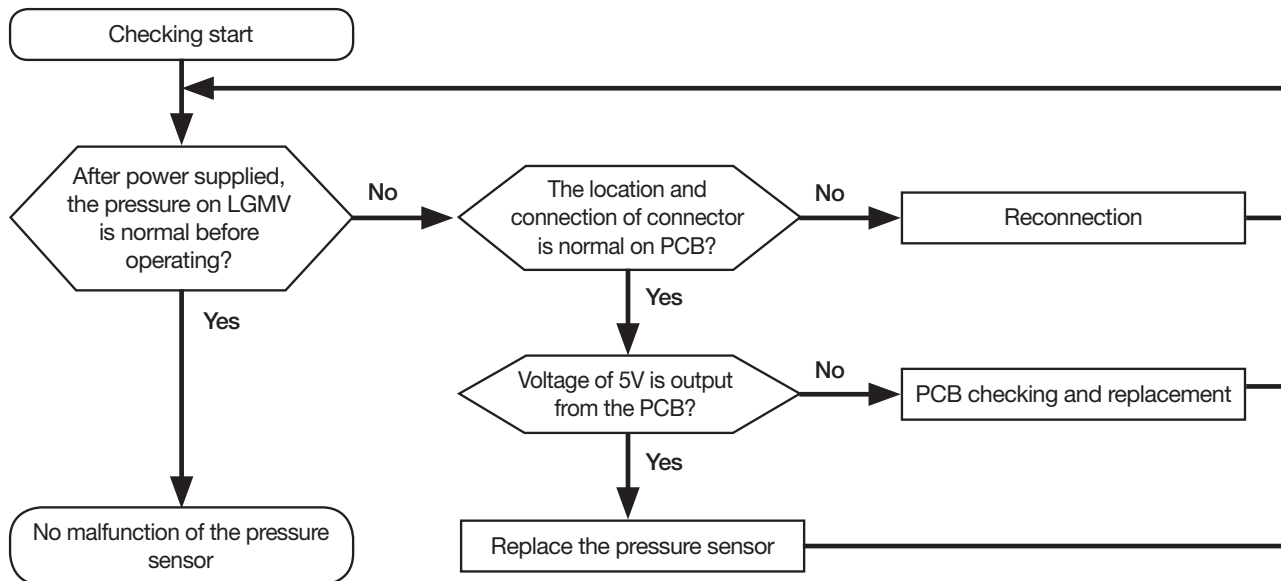


6.7 Troubleshooting Outdoor Error

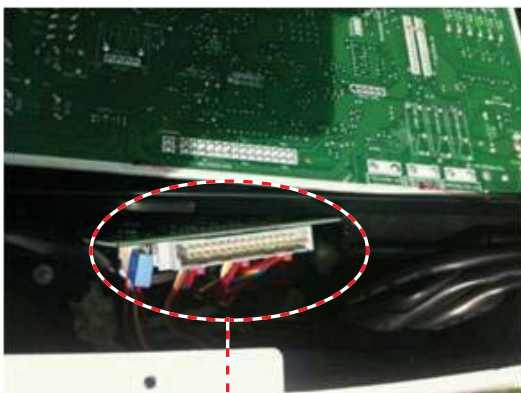
Purpose	Checking single units of sensors for fault	Items for checking	Measurement of the unique resistance by sensor temperature.
----------------	--	---------------------------	---

④ Pressure sensor

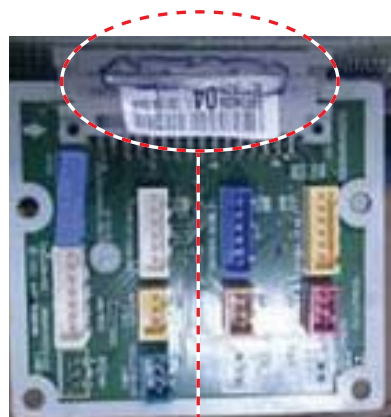
– Position : Outlet of 4-way valve (based on cooling mode)



– In case of Multi models (A3UW18GFA0, A3UW21GFA0), check the ejection of Sub PCB.



Ejection of sub PCB



Insert the sub PCB to the Main PCB

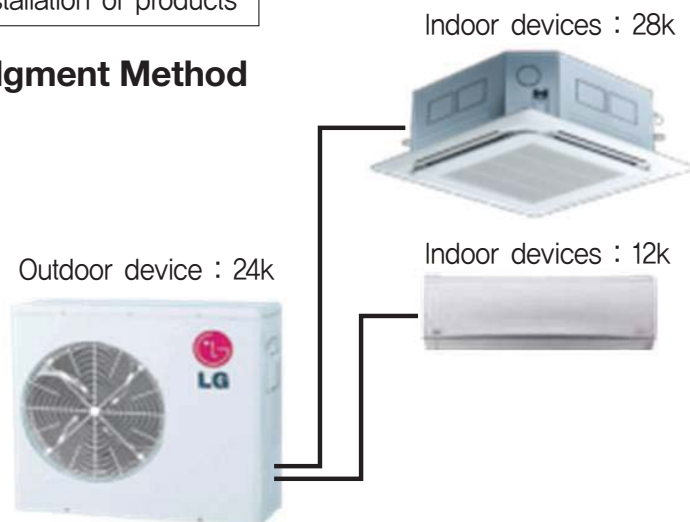
6.7 Troubleshooting Outdoor Error

CH 51 (Indoor Device Connection Error)

Items	Contents
Purpose	Prevention of installation of indoor devices exceeding the capacity of outdoor device
Condition for Generation	Connection of indoor devices exceeding the guaranteed capacity of outdoor device

Re-installation of products

■ Judgment Method



Product guarantee : 150%
(Percentage is different from each model)

Model Name	"Maximum total capacity"
MU2M15	21
MU2M17	24
MU3M19	30
MU3M21	33
MU4M25	39
MU4M27	41
MU5M30	48
MU5M40	52
FM40AH	52
FM48AH	63
FM56AH	73
FM41AH	54
FM49AH	63
FM57AH	73

1) Selection of the possible capacity to be combined with the outdoor device

$$= \frac{24k}{\text{(Outdoor device capacity)}} * \frac{1.5}{\text{(Product guarantee)}} = 36k$$

2) Indoor device capacity

$$= 28k + 12k = 40k$$

➔ Total capacity of indoor devices (40k) exceeds the maximum combination capacity of the outdoor device (36k).
→ CH51(Indoor Device Over-Connection Error)

6.7 Troubleshooting Outdoor Error

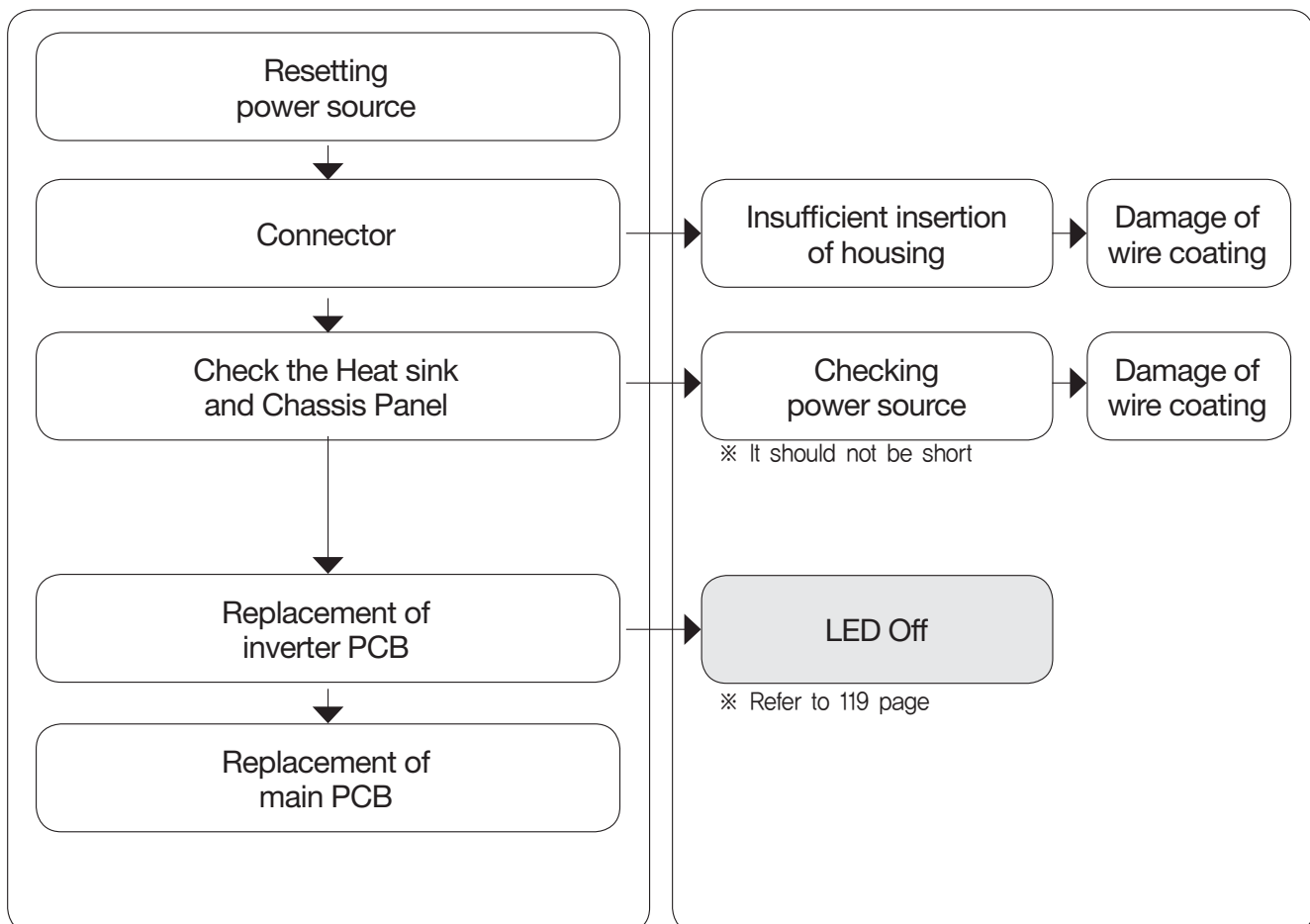
CH 52 (PCB Communication Error)

Items	Contents
Purpose	Checking the communication state between Main PCB and Inverter PCB
Condition for Generation	Generation of noise source interfering with communication

Resetting power source: Wait for 3 minutes after turning the power of the product off.

Items for checking

Sub-items for checking



6.7 Troubleshooting Outdoor Error

CH 52 (PCB Communication Error)

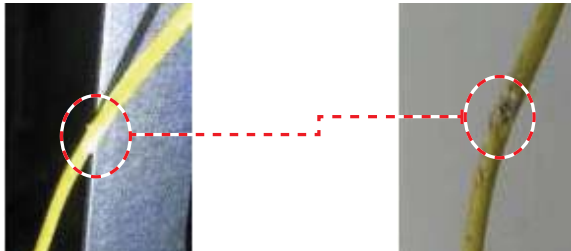
Environment interfering PCB communication

Purpose	Installation environment interfering the communication	Items for checking	Checking method of faulty points
---------	--	--------------------	----------------------------------

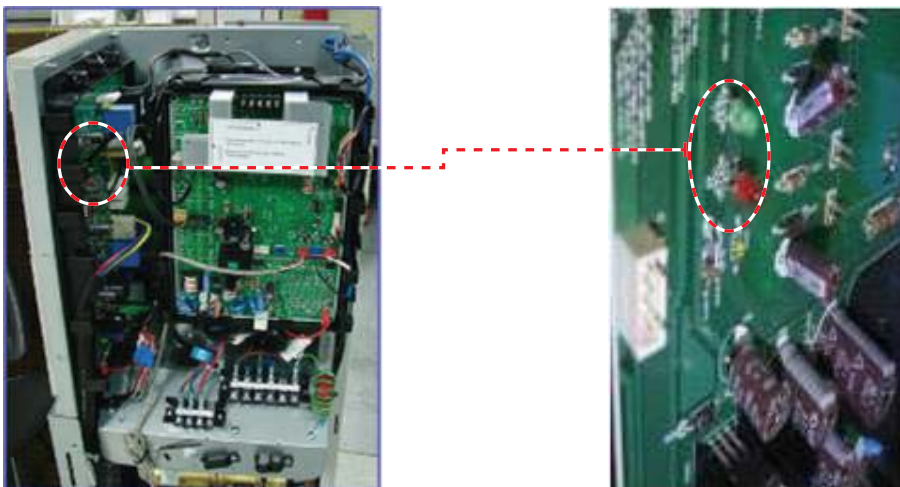
① Insufficient insertion of wires



② Damage of wire coating : Interference with wires or wire coating damage with chopping



③ Inverter PCB LED : Replacement of inverter PCB during LED Off after resetting

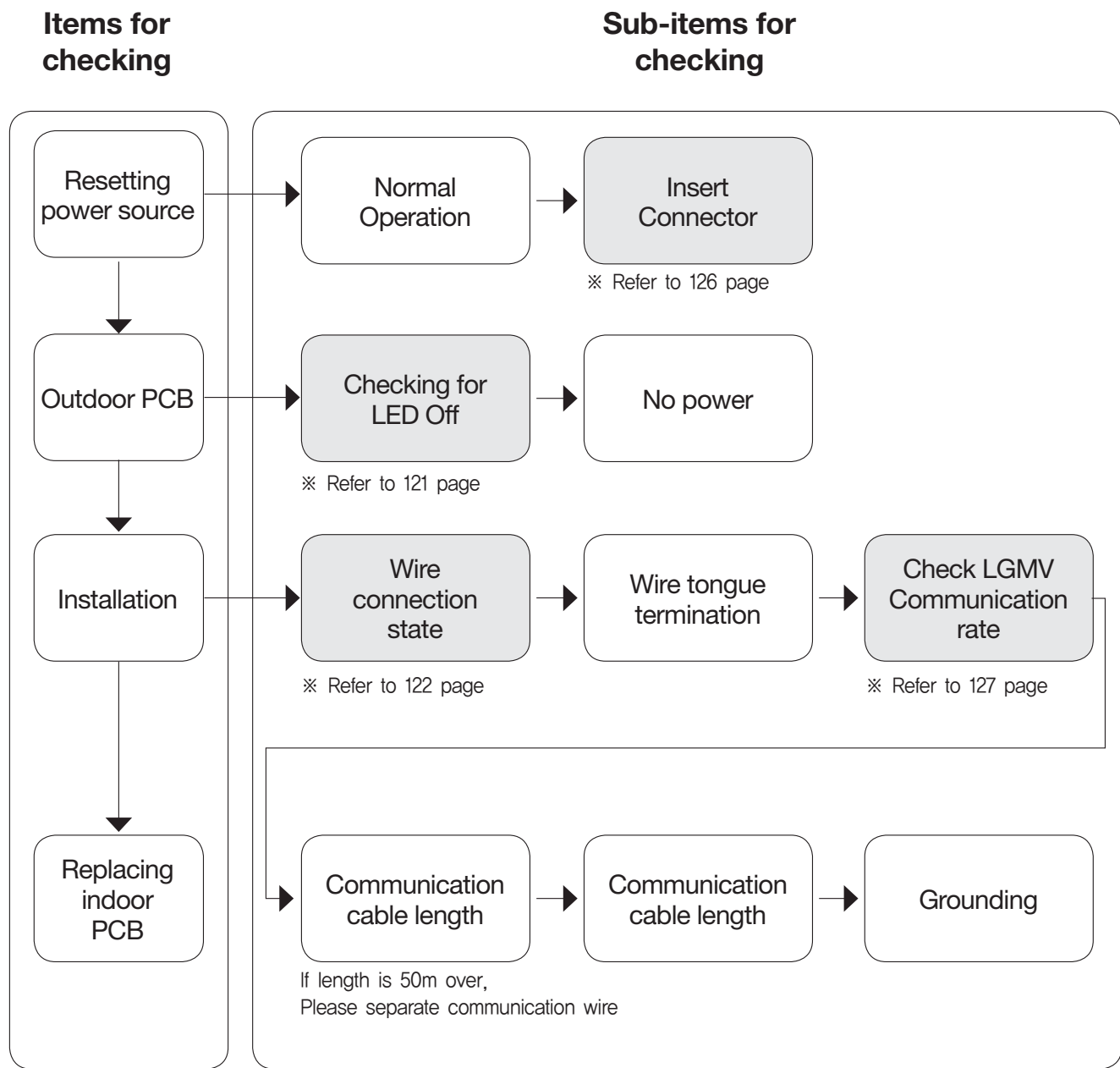


6.7 Troubleshooting Outdoor Error

CH 05/53 (Indoor/Outdoor Device Communication Error) → Detection by indoor devices

Items	Contents
Purpose	Checking for smooth data sending/receiving between indoor/outdoor devices
Condition for Generation	Damage and installation of outdoor device PCB

Resetting power source: Wait for 3 minutes after turning the power of the product off.







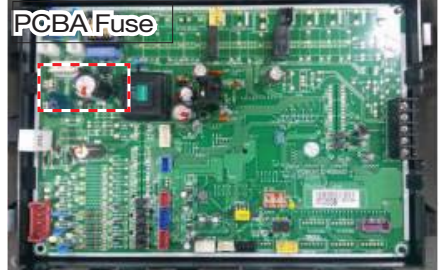

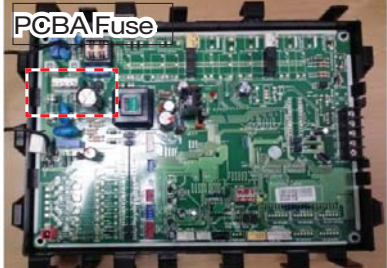
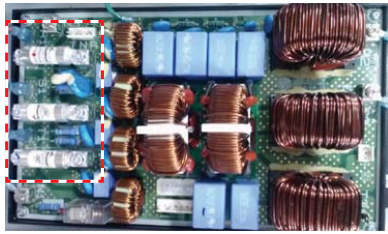
6.7 Troubleshooting Outdoor Error

CH 05/53 (Indoor/Outdoor Device Communication Error) → Detection by indoor devices

Checking Method of Outdoor PCB

Purpose	Checking whether outdoor PCB is normal	Items for checking	Lighting of LED, fuse damage, and reactor connection error
----------------	--	---------------------------	--

- ① Check reactor connection state.
- ② Check fuse state
- ③ Check whether outdoor PCB LED is lighted.

구분	Fuse Point	
2/2.5kW		
4kW		
5kW		C/Box Fuse 
6kW		
7kW		C/Box Fuse 

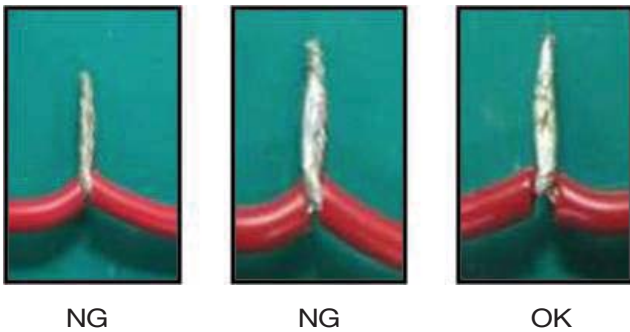
6.7 Troubleshooting Outdoor Error

CH 05/53 (Indoor/Outdoor Device Communication Error) → Detection by indoor devices

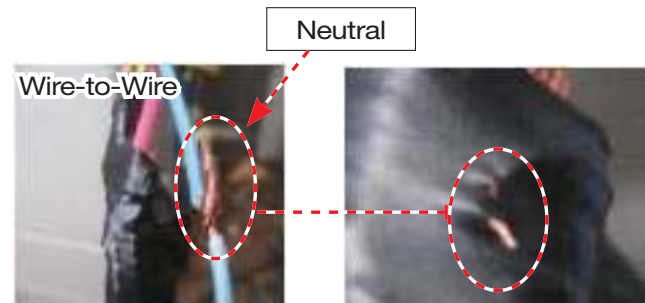
Installation environment interfering with the communication of indoor/outdoor devices

Purpose	Installation environment interfering the communication	Items for checking	Check installation error points
---------	--	--------------------	---------------------------------

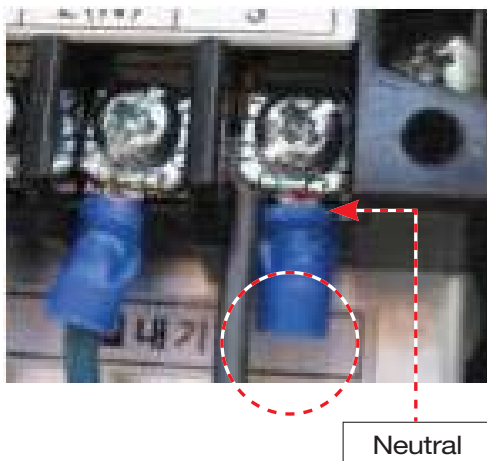
- ① **The communication lines of the indoor /outdoor devices are installed by wire-to-wire method. : In case of additional connection, connect the wires with soldering as shown below.**



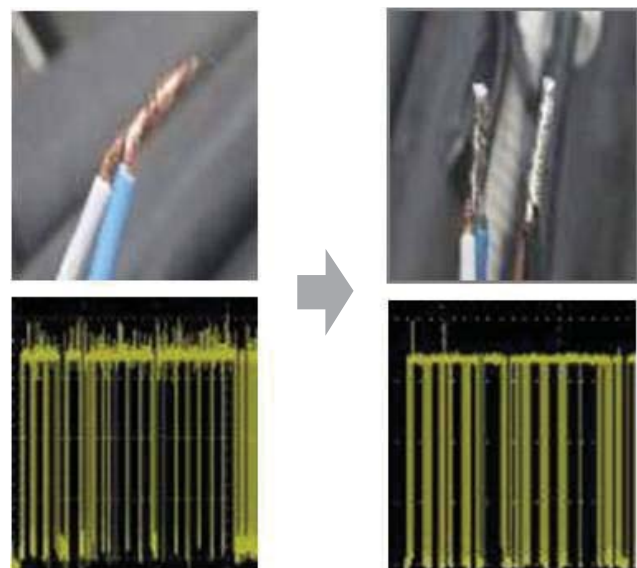
- ③ **The cut section of the wire passes the insulation tape and causes a short with another wire.**



- ② **Wire tongue-termination fault.**



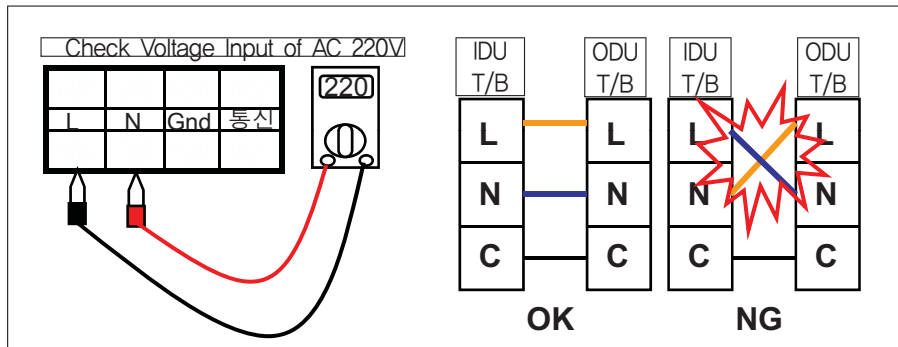
- ④ **Communication noise by oxidized wire arrangement : Soldering is required.**



4. Trouble Shooting

- 1) Check Voltage Input of AC 220V, Indoor & Outdoor Communication
 Outdoor Communication
 When Input AC 220V,
 - Check AC 220V Live ↔ Neutral, Indoor & Outdoor
 - Otherwise, arrange the Communication Wire, Check AC 220V

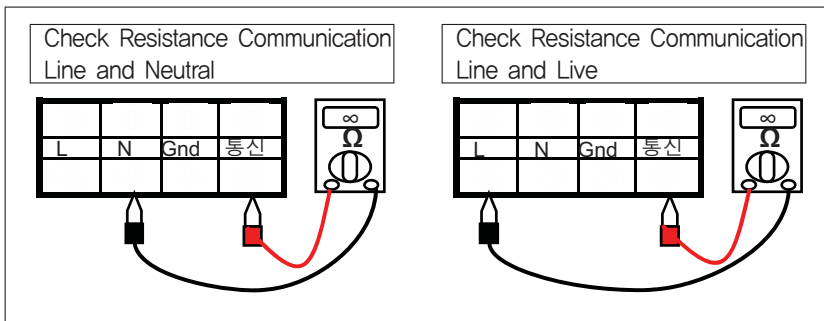
Equipment : Multi-Meter
 Test Mode : AC Voltage
 Indoor & Outdoor Terminal block



- 2) Check electric short Communication Line and Power Line

After Removing Power Line Wire and Communication Line Wire, Check the voltages

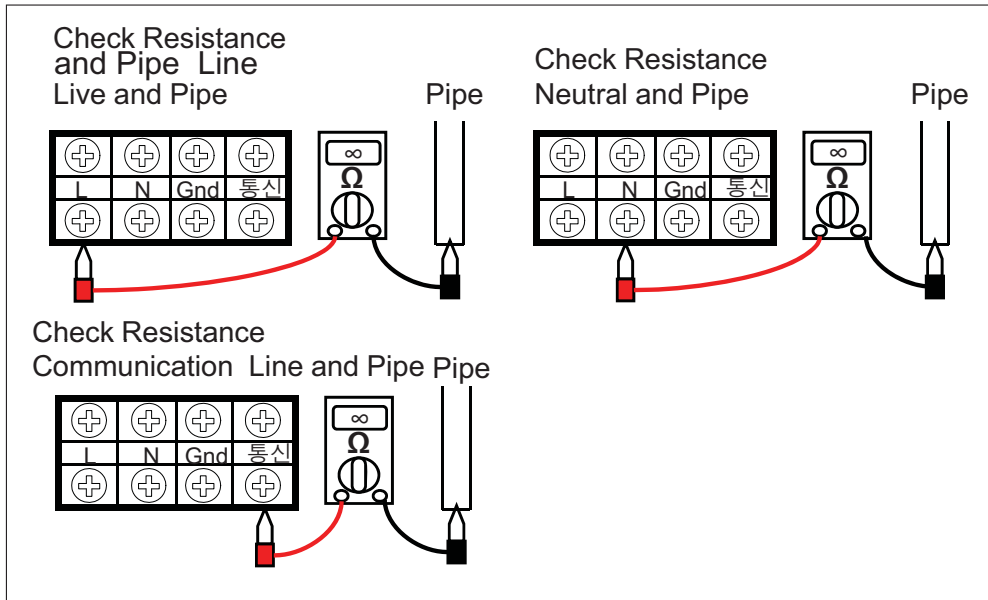
- Check resistance Communication ↔ Live should be infinite
- Check resistance Communication ↔ Neutral should be infinite
- Check resistance Communication ↔ Gnd should be infinite



3) Check electric leakage Communication Line and Pipe

After Removing Power Line Wire and Communication Line Wire, Check the voltages

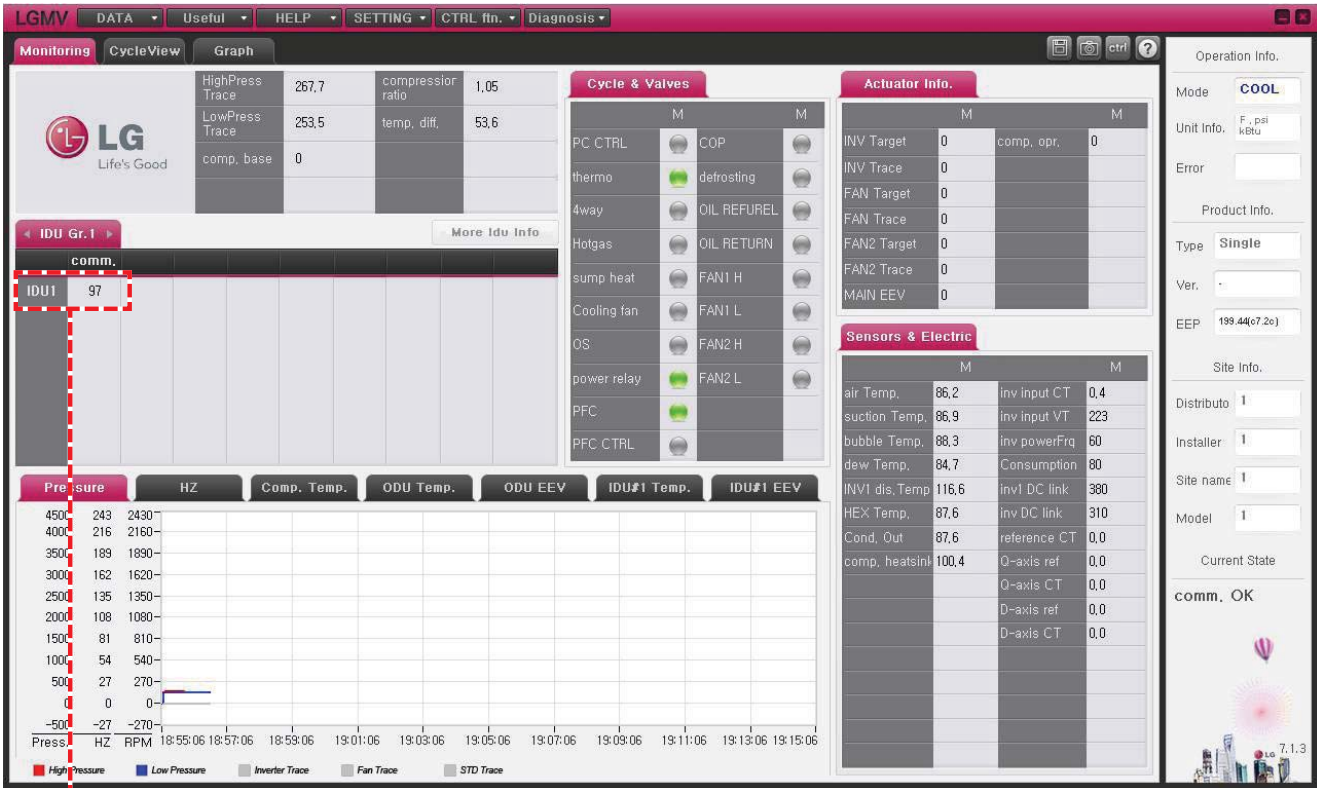
– Check Infinite Resistance between Power /Communication Line and Pipe Line



6.7 Troubleshooting Outdoor Error

CH 05/53 (Indoor/Outdoor Device Communication Error) → Detection by indoor devices

Check LGMV Communication rate



Communication rate (Normally 90% ↑)



6.7 Troubleshooting Outdoor Error

CH 05/53 (Indoor/Outdoor Device Communication Error) → Detection by indoor devices

How to measure for Environment Noise

■ **Applied Model : Multi/Single Outdoor PCBA**
(Refer to PCB P/no of attached file)

■ **Applied S/No : ~ 301xxxxxx (~ Jan, 2013)**

1. Symptom

- Outdoor unit cannot communicate with Indoor unit.
- Outdoor reset then work normal.
: It happens intermittently
- LEDs for showing power-on and communication status are not on or not blinking in outdoor inverter PCBA

2. Causes

- Noise disturb the outdoor unit communication with indoor unit

3. Improvement

- Inserting small connector with capacitor in Inverter PCBA of Outdoor Unit
 - 1) Connector can be applied to the list(PCBA P/No) on the next page
 - 2) Guide where you put it on the next page
- It helps outdoor unit communicate with indoor unit better than before and reduce the noise level



[Connector with capacitor in CN_Flash_Writer or CN_Flash]

4. Trouble Shooting

[Phenomenon]



- 1) Red LED off
- 2) Red LED turn on but not blinking

[PCBA P/NO]

PCBA P/NO
EBR362668**
EBR356522** EBR481682** EBR610154** EBR614818** EBR633722** EBR652505** EBR683491** EBR723989**
EBR753611**
EBR741383**

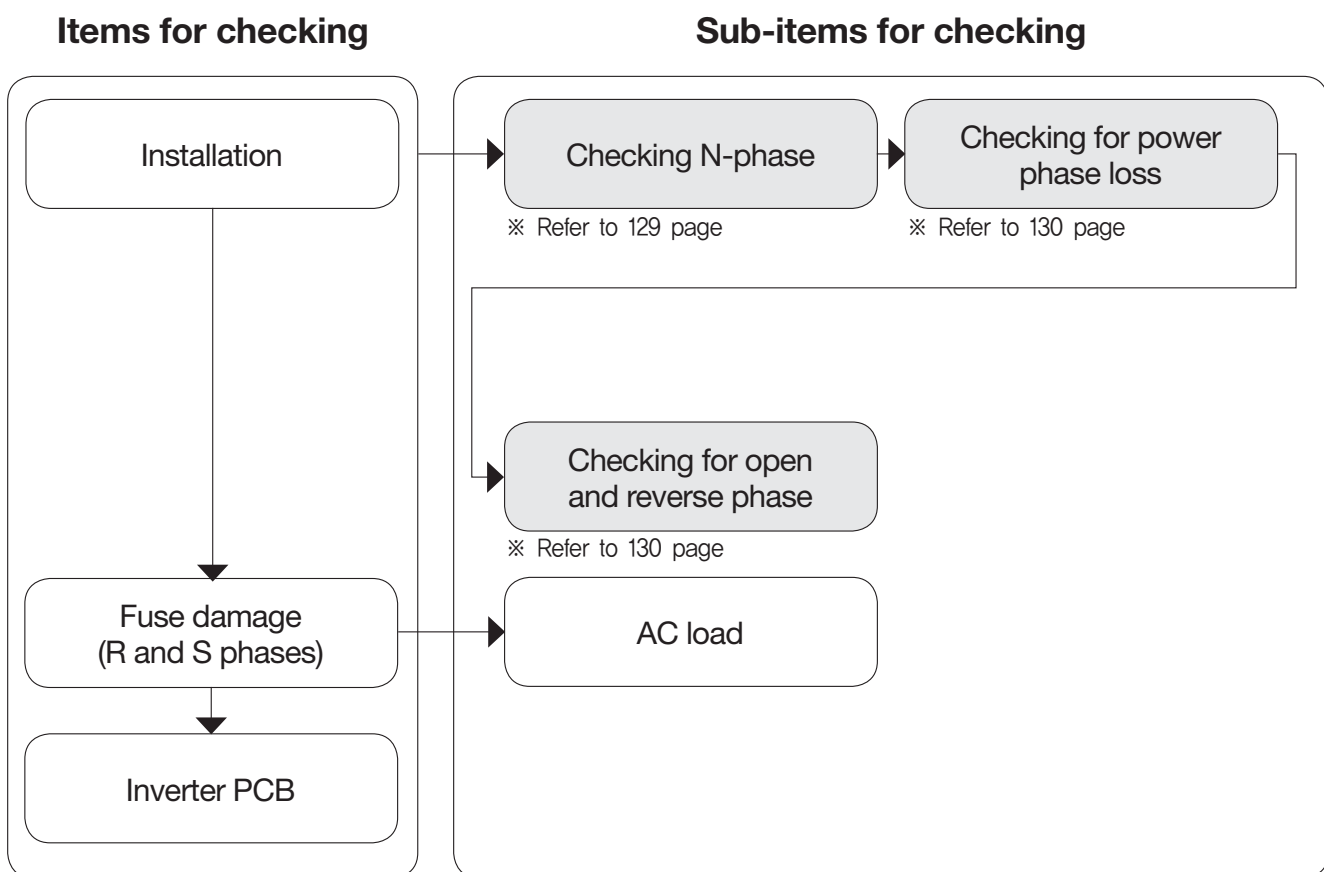


6.7 Troubleshooting Outdoor Error

CH 54 (Open and Reverse Phase Error)

Items	Contents
Purpose	Prevention of phase unbalance and prevention of reverse rotation of constant-rate compressor
Condition for Generation	Main power wiring fault

Resetting power source: Wait for 3 minutes after turning the power of the product off.

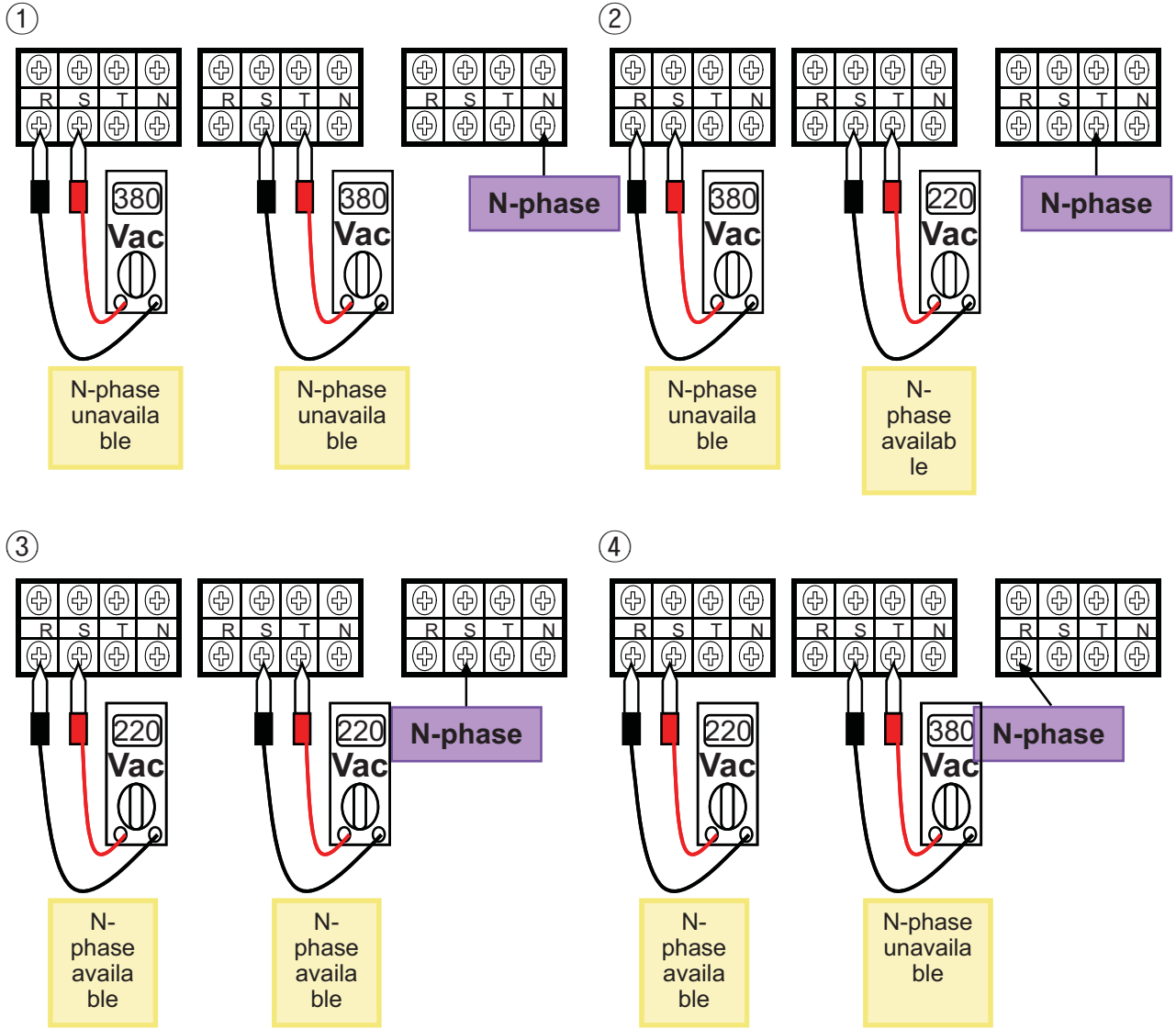


6.7 Troubleshooting Outdoor Error

CH 54 (Open and Reverse Phase Error)

Judgment method of N-phase wiring error

Set the tester in AC voltage measurement mode (The part having wave pattern)

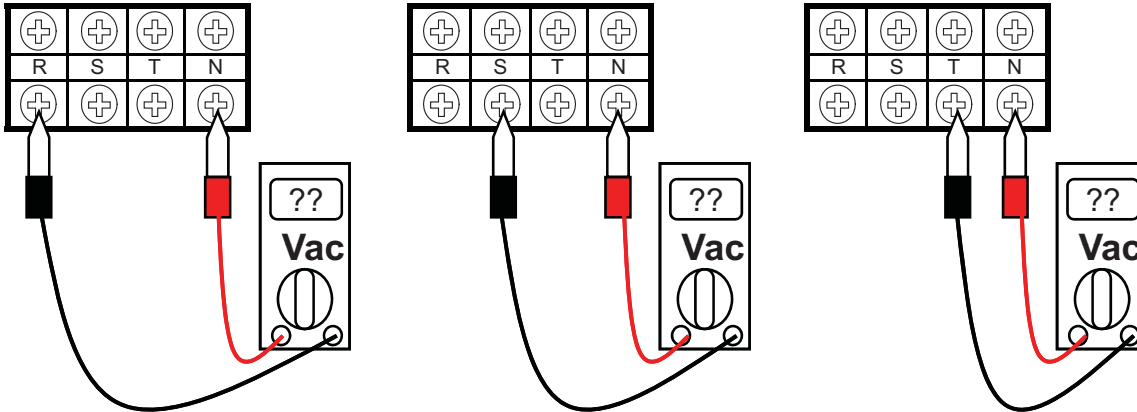


6.7 Troubleshooting Outdoor Error

CH 54 (Open and Reverse Phase Error)

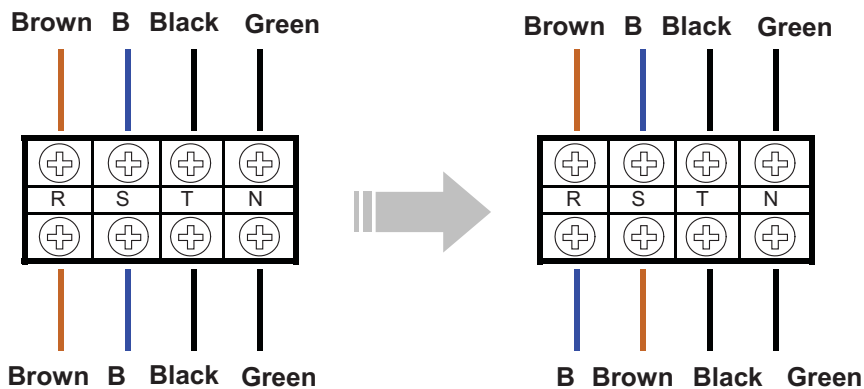
Judgment Method of R,S,T phase loss

- Set the tester in AC voltage measurement mode (The part having wave pattern)
- The part that does not generate voltage was upgraded.
- Power module requires checking..



Judgment method of open and reverse phase of R,S,T

- Operation with replacement of R and S phases only



6.7 Troubleshooting Outdoor Error

CH 60 (EEPROM Fault)

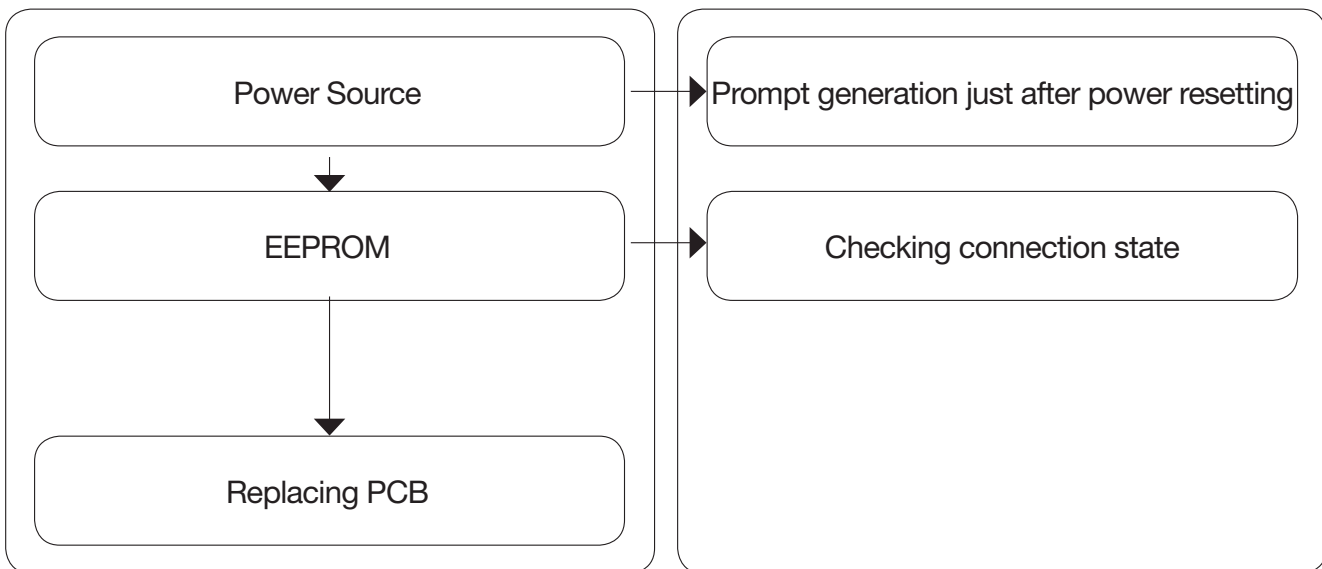
- EEPROM : IC containing the operation data suitable to the product

Items	Contents
Purpose	Prevention of application of wrong cycle data
Condition for Generation	Judgment of the error caused by noise and the fault of EEPROM connection

Resetting power source: Wait for 3 minutes after turning the power of the product off.







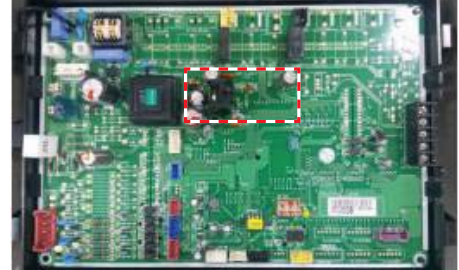

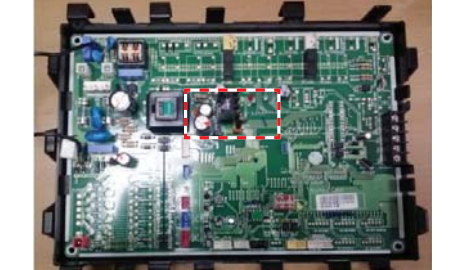

Items for checking

Sub-items for checking



■ How to check the EEPROM assembling state of outdoor devices

- ① Check the direction of EEPROM
(Shape of marking line and direction of EEPROM)
- ② Check whether EEPROM is perfectly adhered.
- ③ Check whether EEPROM lead is put out of the outlet.

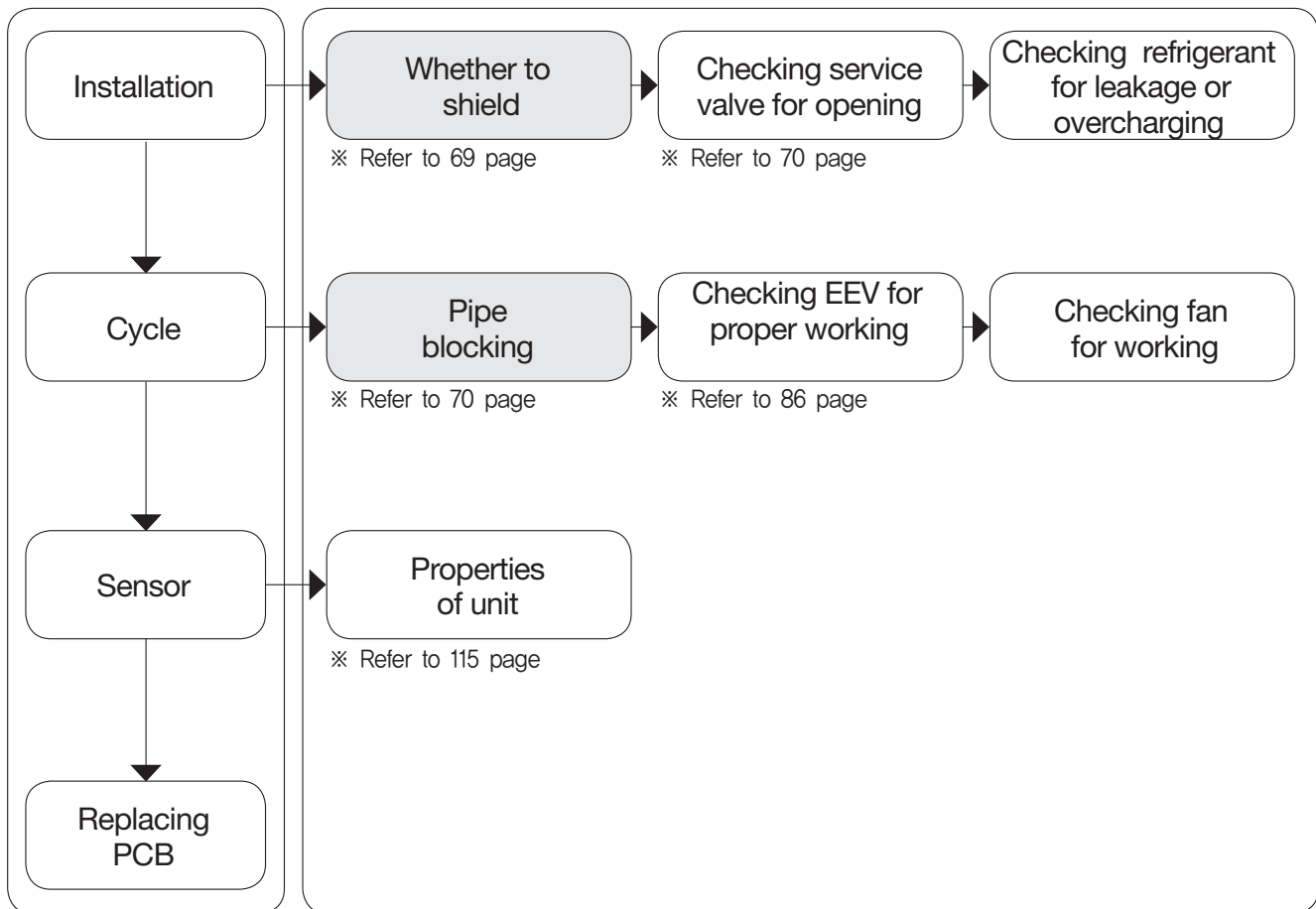
구분	EEPROM Position	
2/2.5kW		
4kW		
5kW		
6kW		
7kW		

6.7 Troubleshooting Outdoor Error

CH 61 (Condenser High Error)

Items	Contents
Purpose	Protection of compressor from elevated pressure and judgment whether to start defrosting
Condition for Generation	Shielding environment, cycle disorder, and sensor unit fault

Resetting power source: Wait for 3 minutes after turning the power of the product off.



6.7 Troubleshooting Outdoor Error

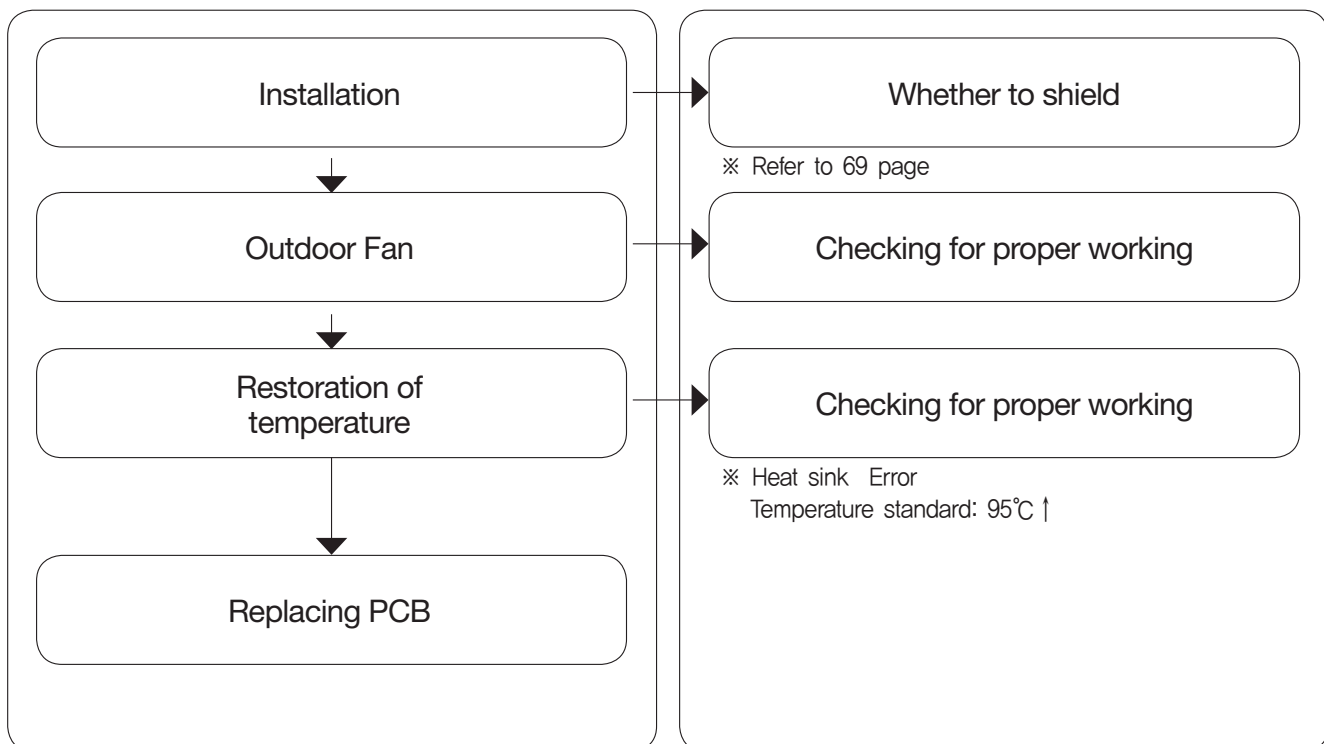
CH 62 (Heat sink High Error)

Items	Contents
Purpose	Prevention of damage of IPM and PSCM/PFCM
Condition for Generation	Heat sink temperature reaches the limit level.

Resetting power source: Wait for 3 minutes after turning the power of the product off.

Items for checking

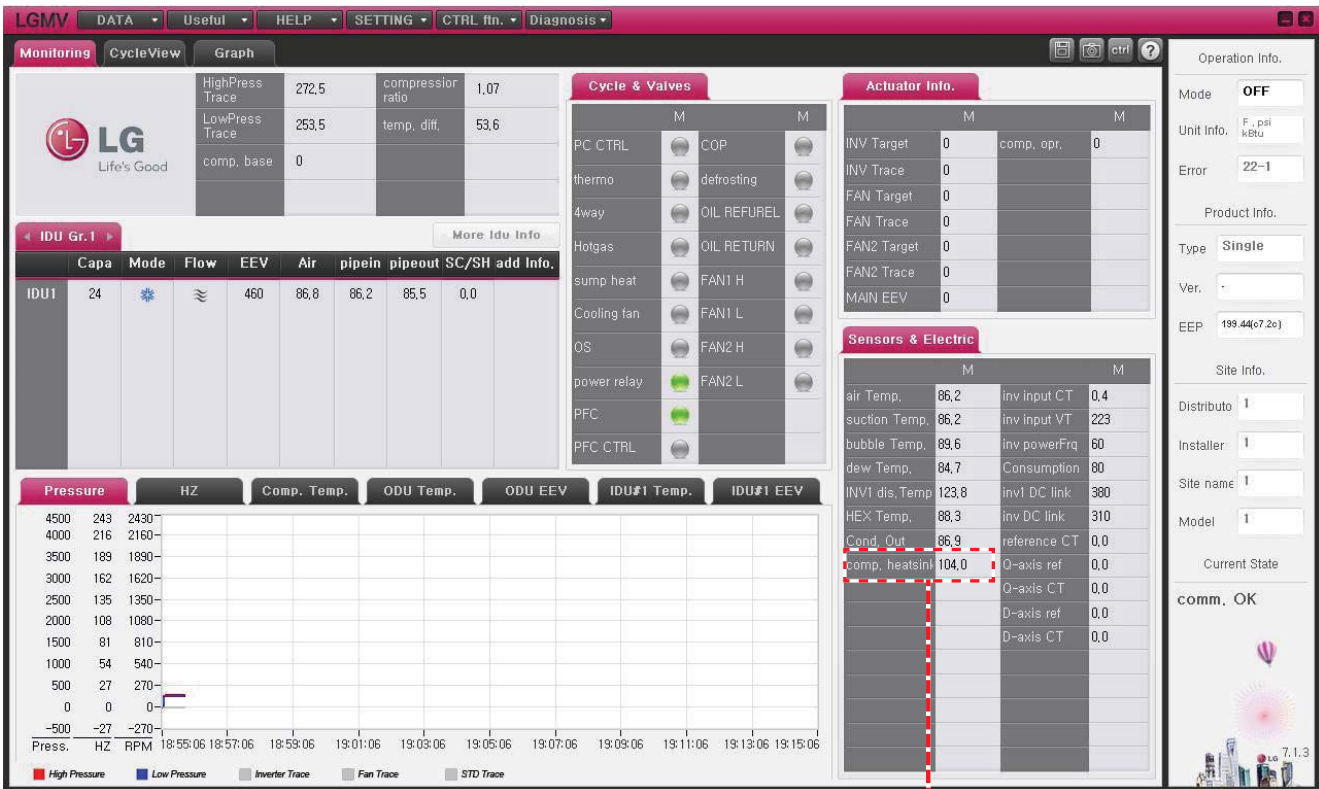
Sub-items for checking



6.7 Troubleshooting Outdoor Error

CH 62 (Heat sink High Error)

Check LGMV for CH 62



comp. heatsink: 104.0

DC Link NG Voltage level

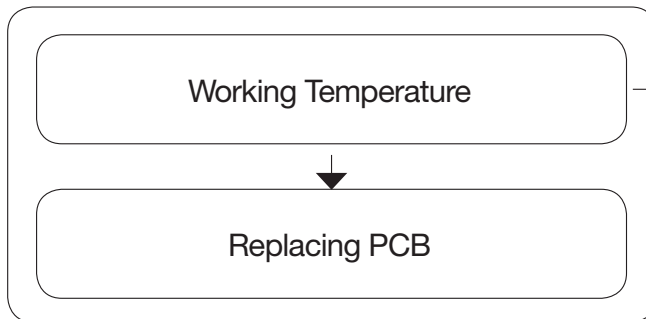
Controller	Current Level
All PCBA	95°C ↑
7kW	85°C ↑

6.7 Troubleshooting Outdoor Error

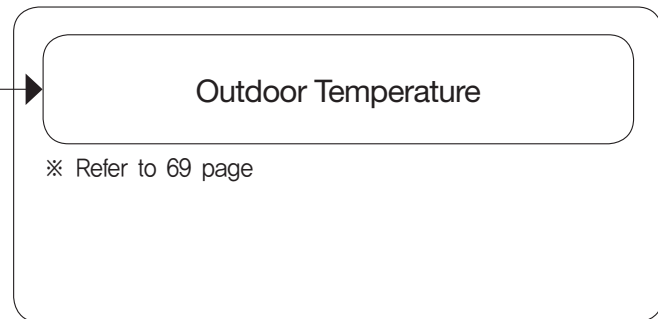
CH 65 (Heat sink Temperature Sensor Open/Short)

Items	Contents
Purpose	Prevention of damage or wrong control of PCBA (PSCM/PFCM,IPM) caused by heat sink temperature detection error
Condition for Generation	Detected temperature is $\leq -40^{\circ}\text{C}$ or $\geq 200^{\circ}\text{C}$.

Items for checking



Sub-items for checking



Environmental factor checking method

- 1) The products works when outdoor temperature is $\leq -20^{\circ}\text{C}$.
- 2) Generation of CH65 case 10 minutes after the operation of the product

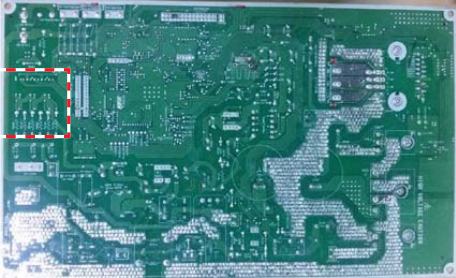
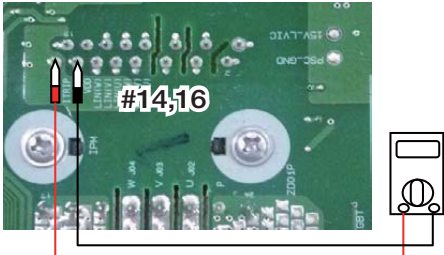
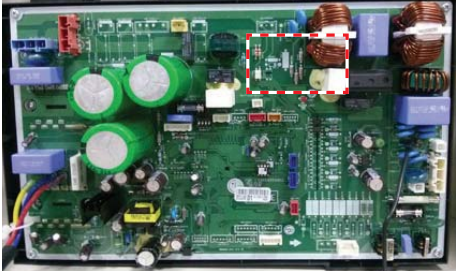



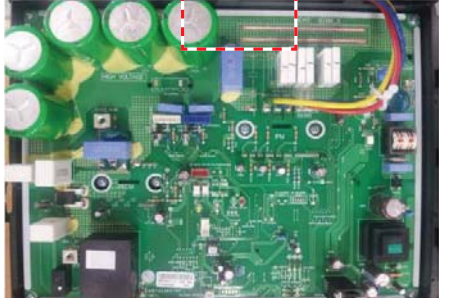


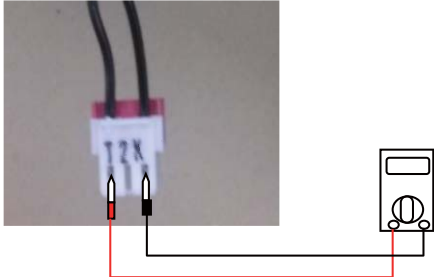


If both of above-stated conditions are satisfied, environmental factor is the cause.

Sensor checking method

1. Power Off
2. Measure the resistance using a tester.
3. Measure the resistance Heat sink Temp point (Refer to the next page)
(based on 25°C , $7\text{K}\Omega \pm 10\%$)

4. Trouble Shooting

구분	Heat sink Tempe Sensor Point	
2/2.5kW		
4kW		
5kW		
6kW		
7kW		

6.7 Troubleshooting Outdoor Error

CH 65 (Heat sink Temperature Sensor Open/Short)

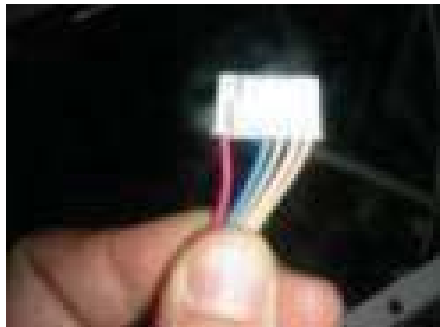
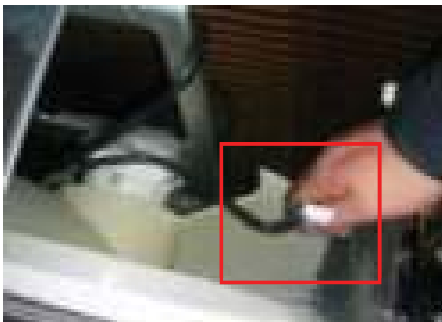
Checking Temperature Sensor Open/Short

1. Check alien substance in the Fan.
2. Check the imprisonment of fan → Please turn Fan, if fan is turn, ok.
3. Check the terminal.



4. Check the Motor. Refer to the below.

■ How to check the outdoor fan motor of BLDC



–. Checking wire terminals for possible short



Tester		정상저항(±10%)	
①	④	∞	∞
⑤	④	Dozens kΩ ~hundreds kΩ	Dozens kΩ ~hundreds kΩ
⑥	④	∞	∞
⑦	④	Dozens kΩ ~hundreds kΩ	Dozens kΩ ~hundreds kΩ



P/NO : MFL67478301

December, 2013