



CONFIDENTIAL

# **Multi Air Conditioner** **SVC MANUAL(General)**

**MODEL : Multi-Inverter Type(R410A)**

## **CAUTION**

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

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## Part 1 General Information

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## 1. Safety Precautions

	Read the precautions in this manual carefully before operating the unit.		This appliance is filled with flammable refrigerant (R32)
	This symbol indicates that the Operation Manual should be read carefully.		This symbol indicates that a service personnel should be handling this equipment with reference to the Installation Manual.




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.





	<b>Be sure not to do.</b>
	<b>Be sure to follow the instruction.</b>
	<b>Dangerous Voltage</b>






### 1.1 Safety Precautions in Repair



<b>⚠ WARNING</b>	
Be sure to disconnect all remote electric power supplies before servicing. 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 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.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	

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.	
Install the panel and the cover of control box securely. Otherwise there is risk of fire or electric shock due to dust, water etc.	
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.	
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.	
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.	
Do not turn on the breaker or power under condition that front panel, cabinet, top cover, control box cover are removed or opened. Otherwise, it may cause fire, electric shock, explosion or death.	
The appliance shall be stored so as to prevent mechanical damage from occurring.	
Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification. Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.	
Keep any required ventilation openings clear of obstruction	
• The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).	
• The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation	
• Compliance with national gas regulations shall be observed	



• Refrigerant tubing shall be protected or enclosed to avoid damage.	
<ul style="list-style-type: none"> <li>• The installation of pipe-work shall be kept to a minimum</li> <li>• When flared joints are reused indoors, the flare part shall be re-fabricated.</li> <li>• When mechanical connectors are reused indoors, sealing parts shall be renewed.</li> </ul>	
<ul style="list-style-type: none"> <li>• Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.</li> <li>• Do not pierce or burn.</li> <li>• Be aware that refrigerants may not contain an odour.</li> <li>• Ducts connected to an appliance shall not contain an ignition source.</li> <li>• Two or more people must lift and transport the product. Avoid personal injury.</li> <li>• Periodic (more than once/year) cleaning of the dust or salt particles stuck on the heat exchanger by using water.</li> <li>• Dismantling the unit, treatment of the refrigerant oil and eventual parts should be done in accordance with local and national standards.</li> </ul>	
<ul style="list-style-type: none"> <li>• Mechanical connections shall be accessible for maintenance purposes.</li> <li>• Ducts connected to an appliance shall not contain an ignition source.</li> <li>• The appliance shall be disconnected from its power source during service and when replacing parts.</li> </ul>	
Pipe-work shall be protected from physical damage.	
<b>Checks to the area</b> Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.	
<b>Work procedure</b> Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.	
<b>General work area</b> All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.	
<b>Checking for presence of refrigerant</b> The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.	
<b>Presence of fire extinguisher</b> If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.	

<p><b>No ignition sources</b></p> <p>No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.</p>	
<p><b>Ventilated area</b></p> <p>Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.</p>	
<p><b>Checks to the refrigeration equipment</b></p> <p>Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.</p> <p>The following checks shall be applied to installations using flammable refrigerants:</p> <ul style="list-style-type: none"> <li>- The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed</li> <li>- The ventilation machinery and outlets are operating adequately and are not obstructed</li> <li>- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant</li> <li>- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected</li> <li>- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.</li> </ul>	
<p><b>Checks to electrical devices</b></p> <p>Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.</p>	



<p><b>Initial safety checks shall include</b></p> <ul style="list-style-type: none"> <li>- Capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.</li> <li>- No live electrical components and wiring are exposed While charging, recovering or purging the system.</li> <li>- Continuity of earth bonding</li> </ul>	
<p><b>Repairs to sealed components</b></p> <p>During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation. Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc. Ensure that apparatus is mounted securely. Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications</p> <p><b>NOTE</b></p> <p>The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.</p>	
<p><b>Repair to intrinsically safe components</b></p> <p>Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak</p>	
<p><b>Cabling Check</b></p> <p>Cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.</p>	
<p><b>Detection of flammable refrigerants</b></p> <p>Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.</p>	





<p><b>Leak detection methods</b></p> <p>The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)</p> <p>Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.</p>	
<p><b>Removal and evacuation</b></p> <p>When breaking into the refrigerant circuit to make repairs – or for any other purpose - conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:</p> <ul style="list-style-type: none"> <li>- Remove refrigerant</li> <li>- Purge the circuit with inert gas</li> <li>- Evacuate</li> <li>- Purge again with inert gas</li> <li>- Open the circuit by cutting or brazing.</li> </ul> <p>The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place. Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.</p>	





<p><b>Charging procedures</b></p> <p>In addition to conventional charging procedures, the following requirements shall be followed.</p> <ul style="list-style-type: none"> <li>- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.</li> <li>- Cylinders shall be kept upright.</li> <li>- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.</li> <li>- Label the system when charging is complete (if not already).</li> <li>- Extreme care shall be taken not to overfill the refrigeration system. Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.</li> </ul>	
<p><b>Decommissioning</b></p> <p>Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.</p> <ol style="list-style-type: none"> <li>a) Become familiar with the equipment and its operation.</li> <li>b) Isolate system electrically.</li> <li>c) Before attempting the procedure ensure that: <ul style="list-style-type: none"> <li>• mechanical handling equipment is available, if required, for handling refrigerant cylinders;</li> <li>• all personal protective equipment is available and being used correctly;</li> <li>• the recovery process is supervised at all times by a competent person;</li> <li>• recovery equipment and cylinders conform to the appropriate standards.</li> </ul> </li> <li>d) Pump down refrigerant system, if possible.</li> <li>e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.</li> <li>f) Make sure that cylinder is situated on the scales before recovery takes place.</li> <li>g) Start the recovery machine and operate in accordance with manufacturer's instructions.</li> <li>h) Do not overfill cylinders. (No more than 80 % volume liquid charge).</li> <li>i) Do not exceed the maximum working pressure of the cylinder, even temporarily.</li> <li>j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.</li> <li>k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.</li> </ol>	












<p><b>Labelling</b></p> <p>Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.</p>	
<p><b>Recovery</b></p> <p>When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.</p> <p>When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt. The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.</p>	

<p style="text-align: center;"> <b>CAUTION</b></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>	

<b>⚠ CAUTION</b>	
Do not use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.	











## 1.2 Inspections after Repair






<b>⚠ WARNING</b>	
Check to see if the terminal block is not dirty or loose. If terminal block 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	

<b>⚠ CAUTION</b>	
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	Type	Chassis		Model names						
				Capacity, kW(kBtu/h)						
				1.5 (5)	2.1 (7)	2.5 (9)	3.5 (12)	4.2 (15)	5.0 (18)	7.1 (24)
Wall mounted	Standard		SJ		AMNW07GSJA0	USNW09GJ3A0	USNW12GJ3A0			
			SK						USNW18GK3A0	AMNW24GSKA0
	Standard Plus		SJ	AMNW05GSJB0 ZMNW05GSJC0	AMNW07GSJB0 ZMNW07GSJC0	USNW09GJ2F0 ZMNW09GSJC0	USNW12GJ2F0 ZMNW12GSJC0	AMNW15GSJB0 ZMNW15GSJC0		
			SK						USNW18GK2F0 ZMNW18GSKC0	USNW24GK2F0 ZMNW24GSKC0
	Deluxe		SJ		AMNW07GSJL0	ASNW09GJ1Z0	ASNW12GJ1Z0			
			SK						ASNW18GK1Z0	ASNW24GK1Z0
	Standard		SJ		AMNW07GSJR0	USNW09GJRZ0	USNW12GJRZ0			
			SK						USNW18GKRZ0	AMNW24GSKR0
ART COOL	Gallary		SF			ZMNW09GAF10 [MA09R NF1]	ZMNW12GAF10 [MA12R NF1]			
Ceiling Cassette	1-Way		TU			ZMNW09GTUA0 [MT09R NU1]	ZMNW12GTUA0 [MT11R NU1]			
	4-Way		TR	ZMNW05GTAA0 [MT06R NR0]	ZMNW07GTAA0 [MT08R NR0]	ZTNW09GRLA0 [CT09R NR0]	ZTNW12GRLA0 [CT12R NR0]			
			TQ						ZTNW18GQLA0 [CT18R NQ0]	
			TP							ZTNW24GPLA0 [CT24R NP0]
Ceiling & Floor		VE				AVNH09GELA2 [CV09 NE2]	AVNH12GELA2 [CV12 NE2]			
		VJ							UVNH18GJLA2 [CV18 NJ2]	UVNH24GJLA2 [CV24 NJ2]


Category	Type	Chassis		Model names						
				Capacity, kW(kBtu/h)						
				1.5 (5)	2.1 (7)	2.5 (9)	3.5 (12)	4.2 (15)	5.0 (18)	7.1 (24)
Ceiling Concealed Duct	High Static Pressure		M1						ZBNW18GM1A0 [CM18R N10]	ZBNW24GM1A0 [CM24R N10]
	Low Static Pressure		L1			ABNH09GL1A*				
			L2			ZBNW09GL2A0	AMNW12GL2A* ZBNW12GL2A0		AMNW18GL2A* ZBNW18GL2A0	
			L3							AMNW24GL3A* ZBNW24GL3A0
Console			QA			AQNH09GALA0 [CQ09 NA0]	AQNH2GALA0 [CQ12 NA0]		AQNH18GALA0 [CQ18 NA0]	


## 2.2 Outdoor units



### MULTI F™ (1 phase)

Heat pump		A2UW14GFA2 [MU2M15 UL4] Z2UW14GFA0 [MU2R15 UL0]	A2UW16GFA2 [MU2M17 UL4] Z2UW16GFA0 [MU2R17 UL0]
No. of connectable indoor units		Max.2	
Total capacity index of connectable indoor units	kW	6.15	7.03
	kBtu/h	21	24
Power supply		1 Ø, 220-240 V, 50 Hz	
Chassis			


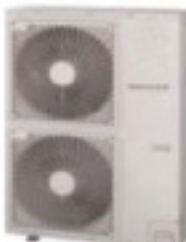
Heat pump		A3UW18GFA2 [MU3M19 UE4] Z3UW18GFA0 [MU3R19 UE0]	A3UW18GFA2 [MU3M19 UE4] Z3UW21GFA0 [MU2R21 UE0]
No. of connectable indoor units		Max.3	
Total capacity index of connectable indoor units	kW	8.79	9.67
	kBtu/h	30	33
Power supply		1 Ø, 220-240 V, 50 Hz	
Chassis			


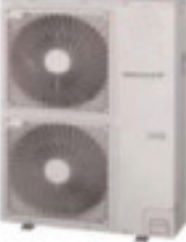
Heat pump		Z4UW24GFA1 [MU4R25 U21]	Z3UW21GFA1 [MU3R21 U21]	Z3UW18GFA1 [MU3R19 U21]
No. of connectable indoor units		Max.4	Max.3	
Total capacity index of connectable indoor units	kW	11.4	9.7	8.8
	kBtu/h	39	33	30
Power supply		1 Ø, 220-240 V, 50 Hz		
Chassis				

Heat pump		A4UW24GFA2 [MU4M25 U44] Z4UW24GFA0 [MU4R25 U40]	A4UW24GFA2 [MU4M25 U44] Z3UW21GFA0 [MU2R21 UE0]
No. of connectable indoor units		Max.4	
Total capacity index of connectable indoor units	kW	11.4	12
	kBtu/h	39	41
Power supply		1 Ø, 220-240 V, 50 Hz	
Chassis			

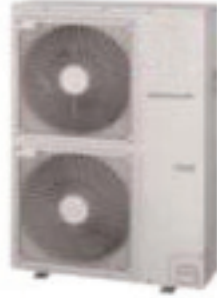
Heat pump		A5UW30GFA2 [MU5M30 U44] Z5UW30GFA0 [MU5R30 U40]	A5UW40GFA1 [MU5M40 U44]
No. of connectable indoor units		Max.5	
Total capacity index of connectable indoor units	kW	14.1	21.1
	kBtu/h	48	72
Power supply		1 Ø, 220-240 V, 50 Hz	
Chassis			

## MULTI F DX™ (1 phase)


Heat pump		A7UW40GFA0 [FM40AH U42]	A8UW48GFA0 [FM48AH U32]	A9UW56GFA0 [FM56AH U32]
No. of connectable indoor units		Max.7	Max.8	Max.9
Total capacity index of connectable indoor units	kW	15.2	18.5	21.4
	kBtu/h	52	63	73
Power supply		1 Ø, 220-240 V, 50 Hz		
Chassis				

Heat pump		A7UW42GFA1 [FM40AH U34]	A8UW48GFA1 [FM48AH U34]	A9UW56GFA1 [FM56AH U34]
No. of connectable indoor units		Max.7	Max.8	Max.9
Total capacity index of connectable indoor units	kW	21.1	22.3	24.6
	kBtu/h	72	78	84
Power supply		1 Ø, 220-240 V, 50 Hz		
Chassis				




## MULTI F DX™ (3 phase)

Heat pump		A7UW42LFA0 [FM41AH U32]	A8UW48LFA0 [FM49AH U32]	A9UW56LFA0 [FM54AH U32]
No.of connectable indoor units		Max.7	Max.8	Max.9
Total capacity index of connectable indoor units	kW	15.8	18.5	21.4
	kBtu/h	54	63	73
Power supply		3 Ø, 380-415 V, 50 Hz		
Chassis				

## MULTI F DX™ (3 phase)

Heat pump		A7UW42LFA1 [FM41AH U34]	A8UW48LFA1 [FM49AH U34]	A9UW56LFA1 [FM57AH U34]
No.of connectable indoor units		Max.7	Max.8	Max.9
Total capacity index of connectable indoor units	kW	21.1	22.6	24.6
	kBtu/h	72	78	84
Power supply		3 Ø, 380-415 V, 50 Hz		
Chassis				

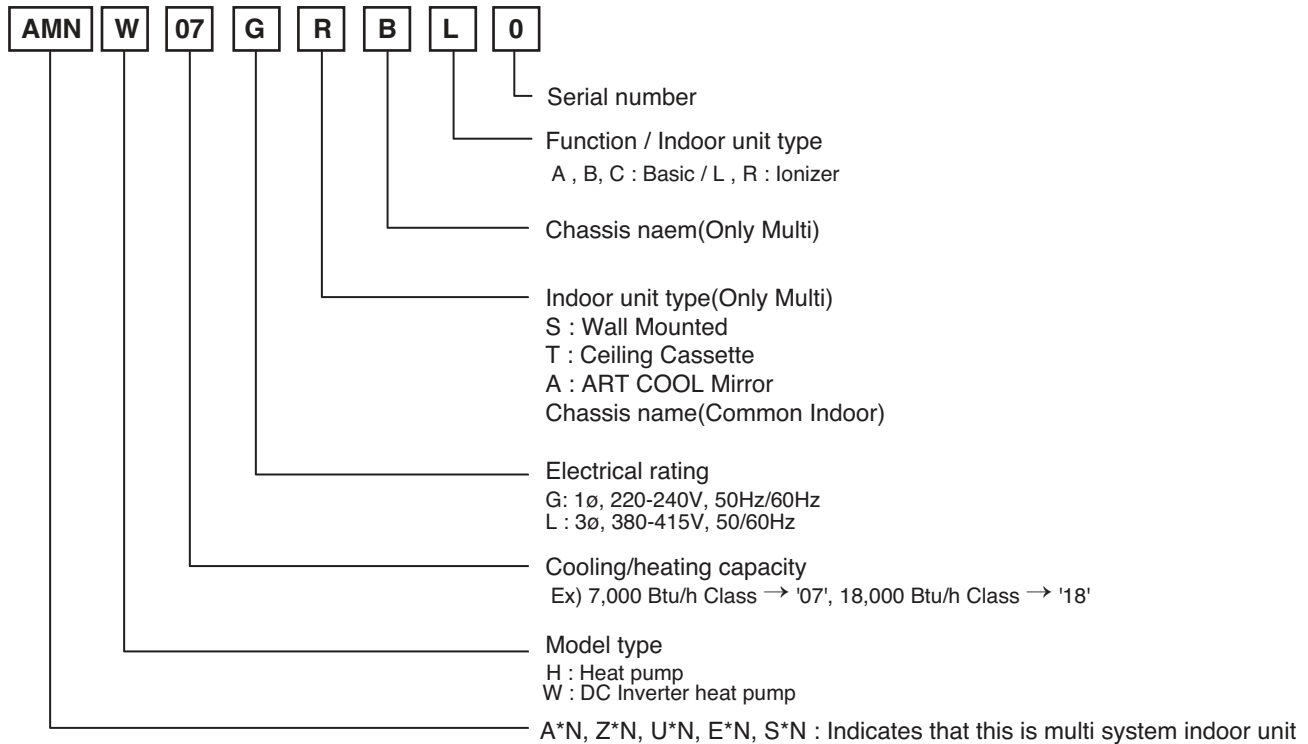
## 2.3 BD(Branch distributor) units

No. of connectable indoor units		Max. 2	Max. 3	Max. 4
Model name		PMBD3620	PMBD3630	PMBD3640
Connectable indoor unit capacity	kW	1.5~7.0	1.5~7.0	1.5~7.0
	kBtu/h	5~24	5~24	5~24
BD unit				

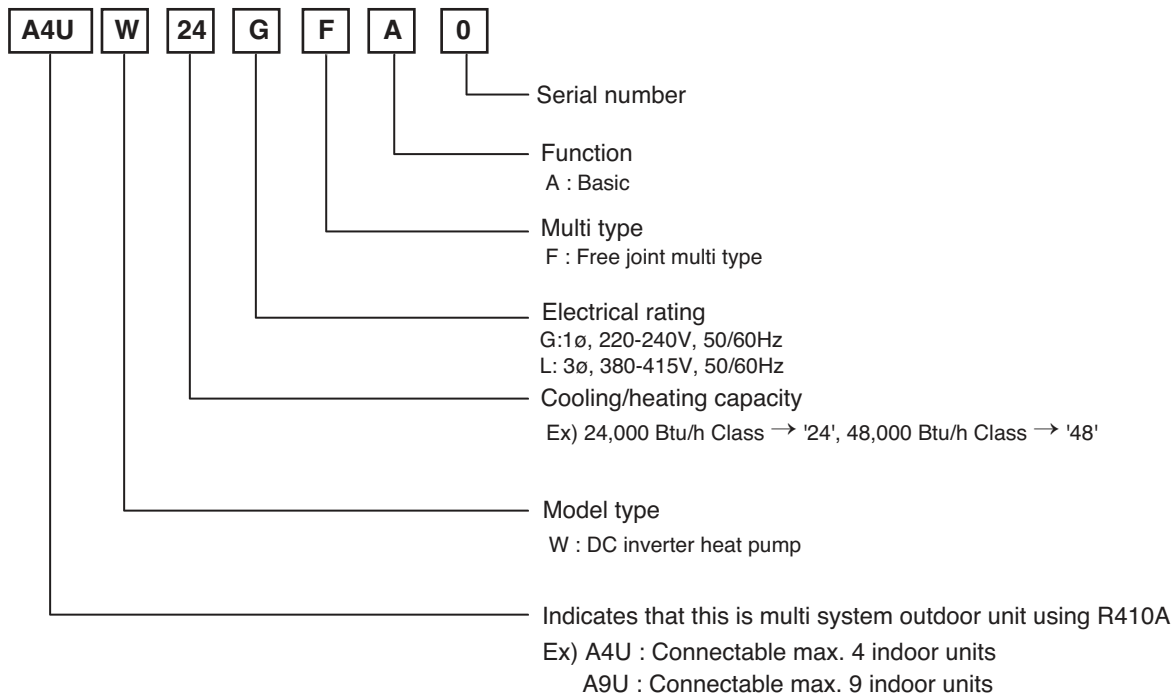


### 3. Nomenclature

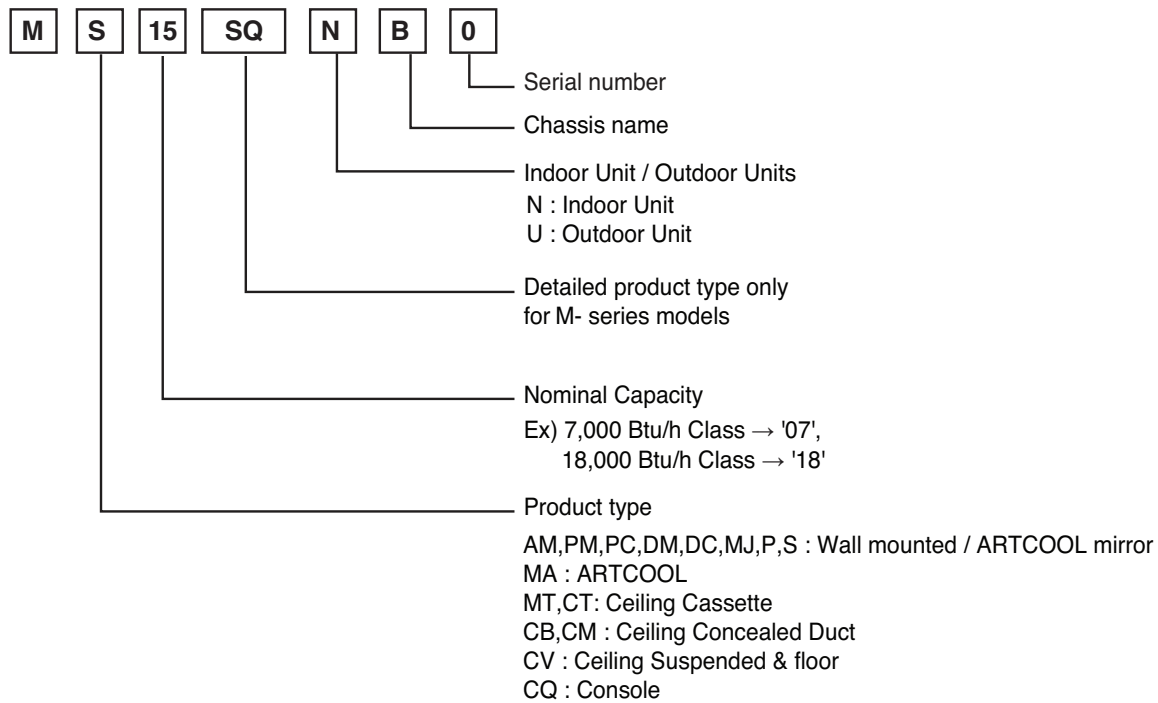
#### 3.1 Indoor Unit(Global)



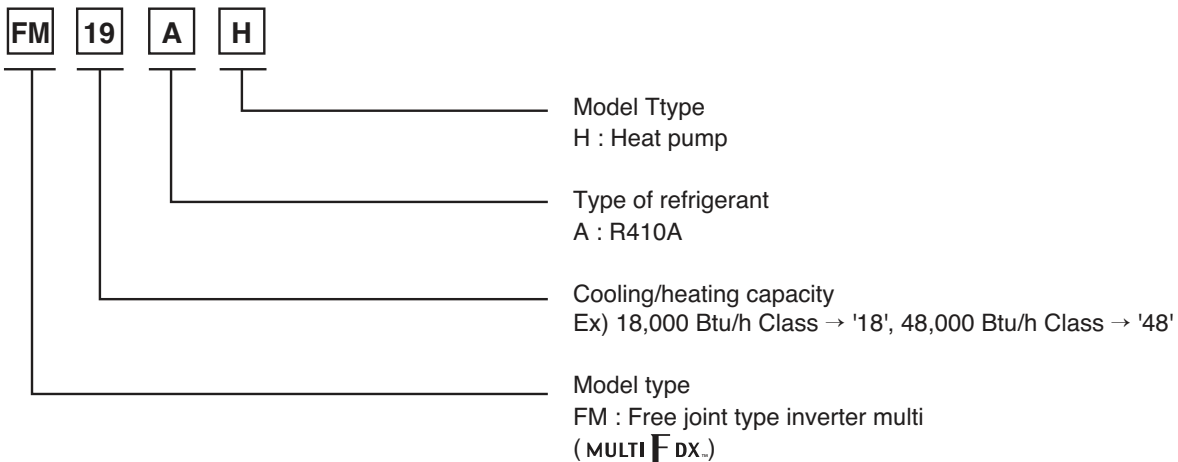
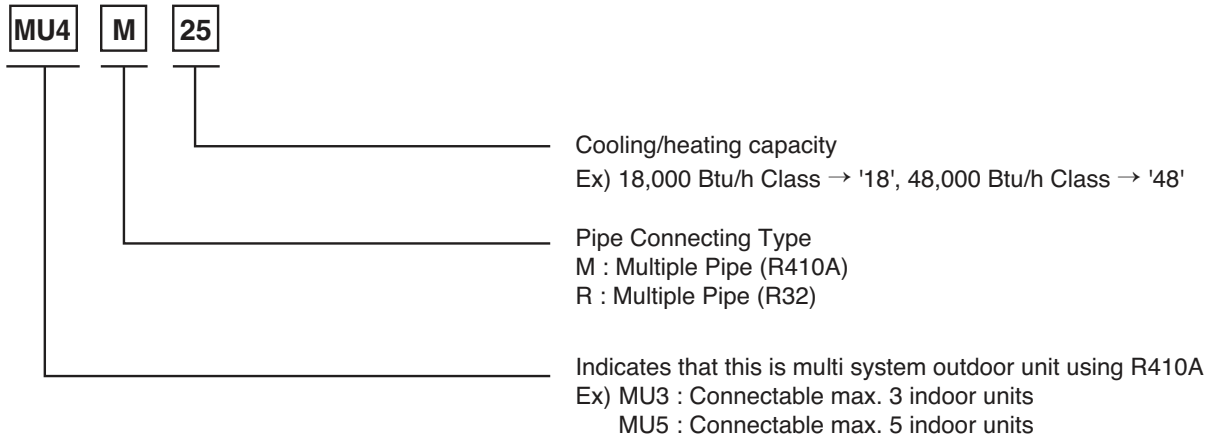
#### 3.2 Outdoor Unit(Global)



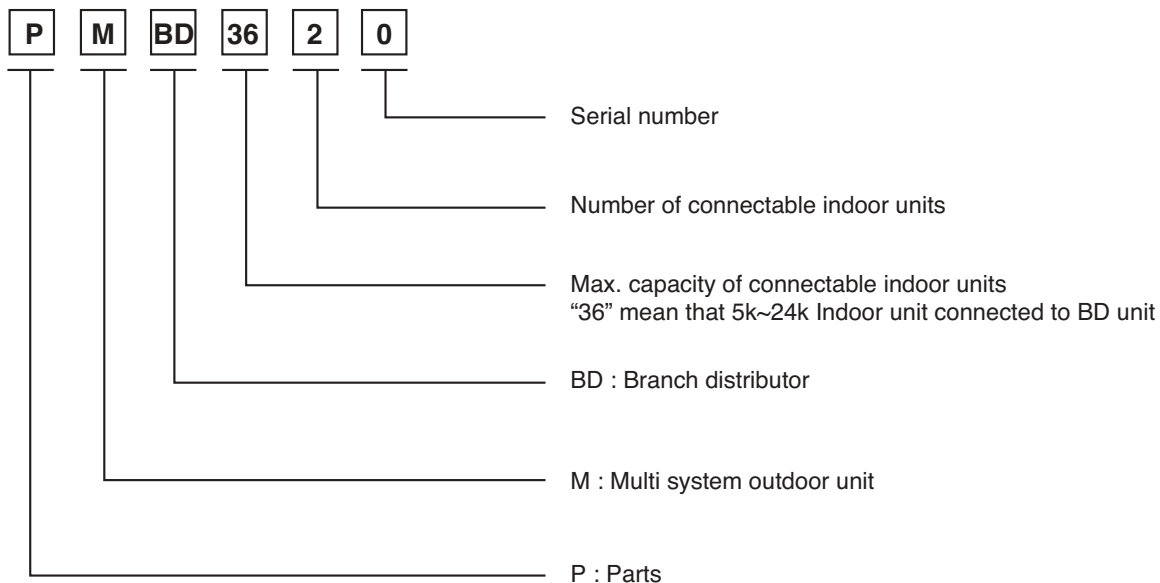
### 3.3 Indoor Unit(Europe)



### 3.4 Outdoor Unit(Europe)



### 3.5 BD units(Global)



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## 1. List of Functions & Accessory

### 1. List of functions

#### ■ Deluxe

#### ◆ List of function

Category	Functions	AMNW07GSJL0 [DM07RP NSJ], ASNW09GJ1Z0 [DM09RP NSJ] ASNW12GJ1Z0 [DM12RP NSJ], ASNW18GK1Z0 [DM18RP NSK] ASNW24GK1Z0 [DM24RP NSK]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	O (5 Steps)
	Airflow direction control (up & down)	O (6 Steps)
	Auto swing (left & right)	O
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	6 / 6 / 6
	Chaos wind(auto wind)	O
	Jet cool/heat	O / O
Air purifying	Swirl wind	X
	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	O
	Allergy Safe filter	X
Installation	Long-life prefilter (washable / anti-fungus)	O
	Drain pump	X
	E.S.P. control*	X
	Electric heater	X
Reliability	High ceiling operation*	X
	Hot start	O
Convenience	Self diagnosis	O
	Auto changeover	X
	Auto cleaning	O
	Auto operation(artificial intelligence)	O
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	X
	Sleep mode	O (7hr)
	Timer(on/off)	O
	Timer(weekly)*	O
Special Functions	Two thermistor control*	O
	Auto Elevation Grille	X
Wireless Remote Controller	Wi-Fi	O (Embedded)
	Humidity Control	X
Wired Remote Controller		O**
Network Solution(LGAP)		O (Accessory)

#### Note

1. O : Applied, X : Not applied, Embedded : Included with product.

Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.

Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.

4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.

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

6. \*\* : It is included by default when the product is manufactured.

# ◆ Accessory Compatibility List

Category		Product	Remark	AMNW07GSJL0 [DM07RP NSJ] ASNW09GJ1Z0 [DM09RP NSJ] ASNW12GJ1Z0 [DM12RP NSJ] ASNW18GK1Z0 [DM18RP NSK] ASNW24GK1Z0 [DM24RP NSK]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	X
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	X
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	X
	2-Remo Control Wire	PZCWRC2	0.25m	X
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMD200	-	O (Embedded)
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

## Standard plus

### List of function

Category	Functions	AMNW05GSJB0 [PM05SP NSJ], AMNW07GSJB0 [PM07SP NSJ] ESNW09GJ2F0 [PM09SP NSJ], ESNW12GJ2F0 [PM12SP NSJ] AMNW15GSJB0 [PM15SP NSJ], ESNW18GK2F0 [PM18SP NSK] ESNW24GK2F0 [PM24SP NSK]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	O (5 Steps)
	Airflow direction control (up & down)	O (6 Steps)
	Auto swing (left & right)	O
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	6 / 6 / 6
	Chaos wind(auto wind)	O
	Jet cool/heat	O / O
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	X
	Auto cleaning	O
	Auto operation(artificial intelligence)	O
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	X
	Sleep mode	O (7hr)
	Timer(on/off)	O
	Timer(weekly)*	O
	Two thermistor control*	O
	Auto Elevation Grille	X
Special Functions	Wi-Fi	O (Embedded)
	Humidity Control	X
Wireless Remote Controller		O**
Wired Remote Controller		O (Accessory)
Network Solution(LGAP)		O

#### Note

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Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.

4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.

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

6. \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNW05GSJB0 [PM05SP NSJ] AMNW07GSJB0 [PM07SP NSJ] ESNW09GJ2F0 [PM09SP NSJ] ESNW12GJ2F0 [PM12SP NSJ] AMNW15GSJB0 [PM15SP NSJ] ESNW18GK2F0 [PM18SP NSK] ESNW24GK2F0 [PM24SP NSK]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
				O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	X
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	X
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	X
	2-Remo Control Wire	PZCWRC2	0.25m	X
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMD200	-	O (Embedded)
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				



## Standard

### List of function

Category	Functions	AMNW07GSJA0 [PM07EP NSJ] ESNW09GJ3A0 [PM09EP NSJ] ESNW12GJ3A0 [PM12EP NSJ] ESNW18GK3A0 [PM18EP NSK] AMNW24GSKA0 [PM24EP NSK]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	O (Manual)
	Airflow direction control (up & down)	O (6 Steps)
	Auto swing (left & right)	X
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	6 / 6 / 6
	Chaos wind(auto wind)	O
	Jet cool/heat	O / O
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	X
	Auto cleaning	O
	Auto operation(artificial intelligence)	O
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	X
	Sleep mode	O (7hr)
	Timer(on/off)	O
	Timer(weekly)*	X
	Two thermistor control*	X
Special Functions	Auto Elevation Grille	X
	Wi-Fi	X
Special Functions	Humidity Control	X
	Wireless Remote Controller	O**
Wired Remote Controller		X
Network Solution(LGAP)		X

#### Note

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Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.  
Accessory line-ups varies by region, so check your local catalogue or local sales material.
- Some functions can be limited by remote controller.
- In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.
- In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
- \* : These functions need to connect the wired remote controller.
- \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNW07GSJA0 [PM07EP NSJ] ESNW09GJ3A0 [PM09EP NSJ] ESNW12GJ3A0 [PM12EP NSJ] ESNW18GK3A0 [PM18EP NSK] AMNW24GSKA0 [PM24EP NSK]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	X
		PQRCHCA0Q(W)	for Hotel	X
	Standard	PREMTB001	Standard II (White)	X
		PREMTBB01	Standard II (Black)	X
		PREMTB100**	Standard III (White)	X
		PREMTBB10**	Standard III (Black)	X
	Premium	PREMTA000(A/B)	Premium	X
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	X
		PDRYCB400	2 Points Dry Contact (For Setback)	X
	Communication type	PDRYCB300	For 3rd Party Thermostat	X
		PDRYCB500	For Modbus	X
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	X
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	X
	2-Remo Control Wire	PZCWRC2	0.25m	X
	Extension Wire	PZCWRC1	10m	X
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, -: Not applicable, Embedded: Included with product. 2. *: Some advanced functions controlled by individual controller cannot be operated. 3. **: It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

# ◆ List of function

Category	Functions	AMNH09GAF*1 [MA09AH* NF1] AMNH12GAF*1 [MA12AH* NF1]
Air flow	Air supply outlet	3
	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)	5 / 6 / 6
	Chaos wind(auto wind)	O
	Jet cool/heat	O / O
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Airpurifier (Plasma)	X
	Airpurifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	X
	Auto cleaning	O
	Auto operation(artificial intelligence)	O
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	X
	Sleep mode	O(7hr)
	Timer(on/off)	O
	Timer(weekly)*	X
	Two thermistor control*	X
Special Functions	Auto Elevation Grille	X
	Wi-Fi	X
Humidity Control		X
Wireless Remote Controller		O**
Wired Remote Controller		X
Network Solution(LGAP)		O

## Note

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Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.  
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- Some functions can be limited by remote controller.
- In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.
- In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
- \* : These functions need to connect the wired remote controller.
- \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNH09GAF*1 [MA09AH* NF1] AMNH12GAF*1 [MA12AH* NF1]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	X
		PQRCHCA0Q(W)	for Hotel	X
	Standard	PREMTB001	Standard II (White)	X
		PREMTBB01	Standard II (Black)	X
		PREMTB100**	Standard III (White)	X
		PREMTBB10**	Standard III (Black)	X
	Premium	PREMTA000(A/B)	Premium	X
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	X
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	X
	2-Remo Control Wire	PZCWRC2	0.25m	X
	Extension Wire	PZCWRC1	10m	X
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

# ◆ List of function

Category	Functions	AMNW07GSJR0 [AM07BP NSJ], USNW09GJRZ0 [AM09BP NSJ] USNW12GJRZ0 [AM12BP NSJ], USNW18GKRZ0 [AM18BP NSK] AMNW24GSKR0 [AM24BP NSK]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	O (5 Steps)
	Airflow direction control (up & down)	O (6 Steps)
	Auto swing (left & right)	O
	Auto swing (up & down)	O
	Airflow steps (fan/cool/heat)	6 / 6 / 6
	Chaos wind(auto wind)	O
	Jet cool/heat	O / O
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	O
	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	X
	Auto cleaning	O
	Auto operation(artificial intelligence)	O
	Auto Restart	O
	Child lock*	O
	Forced operation	O
	Group control*	X
	Sleep mode	O (7hr)
	Timer(on/off)	O
	Timer(weekly)*	O
	Two thermistor control*	O
Special Functions	Auto Elevation Grille	X
	Wi-Fi	O (Embedded)
Humidity Control		X
Wireless Remote Controller		O**
Wired Remote Controller		O (Accessory)
Network Solution(LGAP)		O

## Note

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Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.  
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- In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
- \* : These functions need to connect the wired remote controller.
- \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNW07GSJR0 [AM07BP NSJ] USNW09GJRZ0 [AM09BP NSJ] USNW12GJRZ0 [AM12BP NSJ] USNW18GKRZ0 [AM18BP NSK] AMNW24GSKR0[AM24BP NSK]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	X
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	X
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	X
	2-Remo Control Wire	PZCWRC2	0.25m	X
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	O (Embedded)
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, -: Not applicable, Embedded : Included with product. 2. *: Some advanced functions controlled by individual controller cannot be operated. 3. **: It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

# ◆ List of function

Category	Functions	AMNH09GTUC0 [MT09AH NU1] AMNH12GTUC0 [MT11AH NU1]
Air flow	Air supply outlet	1
	Airflow direction control (left & right)	Auto
	Airflow direction control (up & down)	Auto
	Auto swing (left & right)	O
	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	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	X
	Allergy Safe filter	X
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	O
	E.S.P. control*	O
	Electric heater	X
	High ceiling operation*	O
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	X
	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
	Auto Elevation Grille	X
Special Functions	Wi-Fi	X
	Humidity Control	X
Wireless Remote Controller		O (Accessory)
Wired Remote Controller		O**
Network Solution(LGAP)		O
<b>Note</b> 1. O : Applied, X : Not applied, Embedded : Included with product. Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field. Accessory line-ups varies by region, so check your local catalogue or local sales material. 2. Some functions can be limited by remote controller. 3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that. 4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time. 5. * : These functions need to connect the wired remote controller. 6. ** : It is included by default when the product is manufactured.		

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNH09GTUC0 [MT09AH NU1] AMNH12GTUC0 [MT11AH NU1]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				



# ◆ List of function

Category	Functions	AMNH05GTRA0 [MT06AH NR0] AMNH07GTRA0 [MT08AH NR0] 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)	X
	Jet cool/heat	O / X
Air purifying	Swirl wind	O
	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	PTPKQ0
	Air purifier (Ionizer)	X
	Allergy Safe filter	O
Installation	Long-life prefilter (washable / anti-fungus)	O
	Drain pump	O
	E.S.P. control*	X
	Electric heater	X
Reliability	High ceiling operation*	O
	Hot start	O
Convenience	Self diagnosis	O
	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	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*	X
Special Functions	Auto Elevation Grille	O
	Wi-Fi	X
Humidity Control		X
Wireless Remote Controller		O (Accessory)
Wired Remote Controller		O**
Network Solution(LGAP)		O

## Note

- O : Applied, X : Not applied  
Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.  
Accessory line-ups varies by region, so check your local catalogue or local sales material.
- Some functions can be limited by remote controller.
- In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.
- In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
- \* : These functions need to connect the wired remote controller.
- \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AMNH05GTRA0 [MT06AH NR0] AMNH07GTRA0 [MT08AH NR0] ATNH09GRLE2 [CT09 NR2] ATNH12GRLE2 [CT12 NR2] ATNH18GQLE2 [CT18 NQ2]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	O
		PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

# ◆ List of function

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)	X
	Jet cool/heat	O / X
	Swirl wind	O
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	PTPKM0
	Air purifier (Ionizer)	X
	Allergy Safe filter	O
	Long-life prefilter (washable / anti-fungus)	O
Installation	Drain pump	O
	E.S.P. control*	X
	Electric heater	X
	High ceiling operation*	O
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	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
	Auto Elevation Grille	O (Accessory)
Special Functions	Wi-Fi	X
	Humidity Control	X
Wireless Remote Controller		O (Accessory)
Wired Remote Controller		O**
Network Solution(LGAP)		O

## Note

- O : Applied, X : Not applied  
Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.  
Accessory line-ups varies by region, so check your local catalogue or local sales material.
- Some functions can be limited by remote controller.
- In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.
- In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
- \* : These functions need to connect the wired remote controller.
- \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	ATNH24GPLE2 [CT24 NP2] ATNH30GPLE2 [UT30 NP2] ATNH36GNLE2 [UT36 NN2] ATNH42GMLE2 [UT42 NM2] ATNH48GMLE2 [UT48 NM2] ATNH60GMLE2 [UT60 NM2]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	O
		PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMD200	-	X
	Human detecting sensor	PTVSMA0	-	X

**Note**

1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product.
2. \* : Some advanced functions controlled by individual controller cannot be operated.
3. \*\* : It could not be operated some functions.
4. If you need more detail, please refer to the **BECON** PDB or the manual of product.  
(<http://partner.lge.com/global> : Home > Doc.Library > Product > Control(BECON))

# ◆ List of function

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
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	Auto Restart	O
	Child lock*	O
	Forced operation	X
	Group control*	O
	Sleep mode	O
	Timer(on/off)	O
	Timer(weekly)*	O
	Two thermistor control*	O
	Auto Elevation Grille	X
Special Functions	Wi-Fi	X
	Humidity Control	X
Wireless Remote Controller		O (Accessory)
Wired Remote Controller		O**
Network Solution(LGAP)		O

## Note

1. O : Applied, X : Not applied, Embedded : Included with product.

Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.

Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.

4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.

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

6. \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	ABNW18GM1A0 [CM18 N14], ABNW24GM1A0 [CM24 N14], ABNW30GM1A0 [UM30 N14], ABNW36GM2A0 [UM36 N24], ABNW42GM2A0 [UM42 N24], ABNW48GM3A0 [UM48 N34], ABNW60GM3A0 [UM60 N34]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O***
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
		PDRYCB400	2 Points Dry Contact (For Setback)	O
	Communication type	PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	O
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, -: Not applicable, Embedded: Included with product. 2. *: Some advanced functions controlled by individual controller cannot be operated. 3. **: It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON)) • *** : In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.				

# ◆ List of function

Category	Functions	ABNH09GL1A2 [CB09L N12] ABNW09GL2A2 [CB09L N22] ABNH12GL2A2 [CB12L N22] ABNH18GL2A2 [CB18L N22] ABNH24GL3A2 [CB24L N32]
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
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	X
	Allergy Safe filter	X
Installation	Long-life prefilter (washable / anti-fungus)	O
	Drain pump	O
	E.S.P. control*	O
	Electric heater	X
Reliability	High ceiling operation*	X
	Hot start	O
Convenience	Self diagnosis	O
	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	Auto Restart	O
	Child lock*	O
	Forced operation	X
	Group control*	O
	Sleep mode	O
	Timer(on/off)	O
	Timer(weekly)*	O
	Two thermistor control*	O
Special Functions	Auto Elevation Grille	X
	Wi-Fi	X
Humidity Control		X
Wireless Remote Controller		O (Accessory)
Wired Remote Controller		O**
Network Solution(LGAP)		O

## Note

1. O : Applied, X : Not applied, Embedded : Included with product.

Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.

Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.

4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.

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

6. \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	ABNH09GL1A2 [CB09L N12] ABNW09GL2A2 [CB09L N22] ABNH12GL2A2 [CB12L N22] ABNH18GL2A2 [CB18L N22] ABNH24GL3A2 [CB24L N32]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O***
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	O
		PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	O
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON)) • *** : In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.				



# ◆ List of function

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
	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)	4 / 5 / 4
	Chaos wind(auto wind)	X
	Jet cool/heat	O / X
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	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
	Auto Elevation Grille	X
Special Functions	Wi-Fi	X
	Humidity Control	X
Wireless Remote Controller		O**
Wired Remote Controller		O(Accessory)
Network Solution(LGAP)		O

## Note

1. 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. Some functions can be limited by remote controller.
3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.
4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.
5. \* : These functions need to connect the wired remote controller.
6. \*\* : It is included by default when the product is manufactured.
7. For synchro operation, some functions and accessories are not available. Refer to PDB of outdoor unit.

## ◆ Accessory Compatibility List

Category		Product	Remark	AVNH09GELA2 [CV09 NE2] AVNH12GELA2 [CV12 NE2] UVNH18GJLA2 [CV18 NJ2] UVNH24GJLA2 [CV24 NJ2] UVNH30GJLA2 [UV30 NJ2] UVNH36GKLA2 [UV36 NK2] UVNH42GLLA2 [UV42 NL2] UVNH60GLLA2 [UV60 NL2]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	O
		PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMDD200	-	X
	Human detecting sensor	PTVSMA0	-	X
<b>Note</b> 1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product. 2. * : Some advanced functions controlled by individual controller cannot be operated. 3. ** : It could not be operated some functions. 4. If you need more detail, please refer to the <b>BECON</b> PDB or the manual of product. ( <a href="http://partner.lge.com/global">http://partner.lge.com/global</a> : Home > Doc.Library > Product > Control(BECON))				

# ◆ List of function

Category	Functions	AQNH09GALA0 [CQ09 NA0] AQNH12GALA0 [CQ12 NA0] AQNH18GALA0 [CQ18 NA0]
Air flow	Air supply outlet	2
	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)	4 / 5 / 4
	Chaos wind(auto wind)	X
	Jet cool/heat	O / X
	Swirl wind	X
Air purifying	Triple filter (Deodorizing)	X
	Air purifier (Plasma)	X
	Air purifier (Ionizer)	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
Reliability	Hot start	O
	Self diagnosis	O
Convenience	Auto changeover	O (Single Only)
	Auto cleaning	X
	Auto operation(artificial intelligence)	O (Multi Only)
	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
	Auto Elevation Grille	X
Special Functions	Wi-Fi	X
	Humidity Control	X
Wireless Remote Controller		O**
Wired Remote Controller		O(Accessory)
Network Solution(LGAP)		O

## Note

1. O : Applied, X : Not applied, Embedded : Included with product.

Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.

Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. In case of ducted type indoor units using the wireless remote controller, it needs to connect the wired remote controller for received the signal of that.

4. In case of cassette type indoor units, Plasma kit and Auto Elevation Grille functions are not applicable at the same time.

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

6. \*\* : It is included by default when the product is manufactured.

## ◆ Accessory Compatibility List

Category		Product	Remark	AQNH09GALA0 [CQ09 NA0] AQNH12GALA0 [CQ12 NA0] AQNH18GALA0 [CQ18 NA0]
Wireless Remote Controller		PQWRHQ0FDB	Heat Pump	O
Wired Remote Controller	Simple	PQRCVCL0Q(W)	Simple	O
		PQRCHCA0Q(W)	for Hotel	O
	Standard	PREMTB001	Standard II (White)	O
		PREMTBB01	Standard II (Black)	O
		PREMTB100**	Standard III (White)	O
		PREMTBB10**	Standard III (Black)	O
	Premium	PREMTA000(A/B)	Premium	O
Dry contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	O
		PDRYCB300	For 3rd Party Thermostat	O
		PDRYCB500	For Modbus	O
Gateway	IDU PI485	PHNFP14A0	Without case	X
		PSNFP14A0	With case	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	CO <sub>2</sub> Sensor	PES-C0RV0	For ERV, ERV DX Indoor units	X
	Group control wire	PZCWRCG3	0.25m	O
	2-Remo Control Wire	PZCWRC2	0.25m	O
	Extension Wire	PZCWRC1	10m	O
	Wi-Fi Controller*	PWFMD200	-	X
	Human detecting sensor	PTVSMA0	-	X

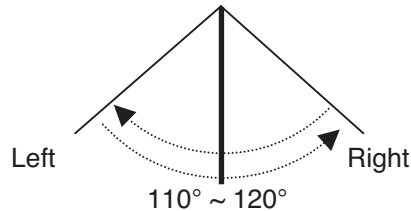
**Note**

1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product.
2. \* : Some advanced functions controlled by individual controller cannot be operated.
3. \*\* : It could not be operated some functions.
4. If you need more detail, please refer to the **BECON** PDB or the manual of product.  
(<http://partner.lge.com/global> : Home > Doc.Library > Product > Control(BECON))

## 2. Air flow

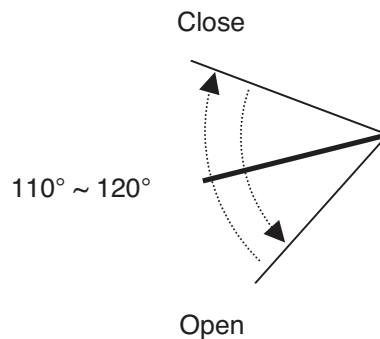
### 2.1 Auto swing (left & right)

- 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.



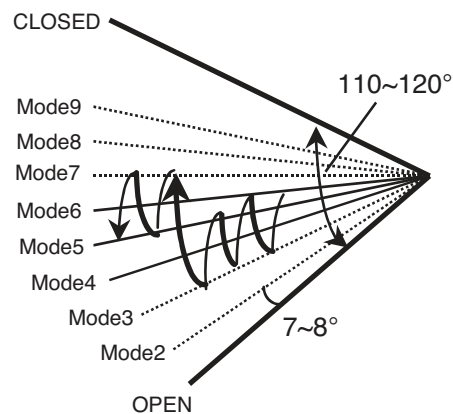
### 2.2 Auto swing (up & down)

- 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)

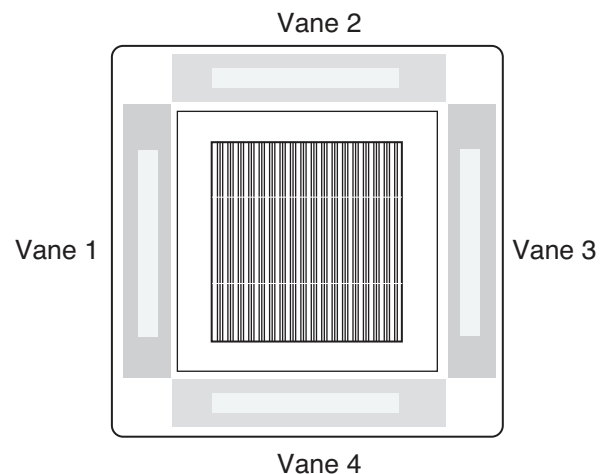
- When "Auto" step selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 Seconds. randomly by the Chaos Simulation

## 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)

Vane 1	Open				
Vane 2	Open				
Vane 3	Open				
Vane 4	Open				
	Time				

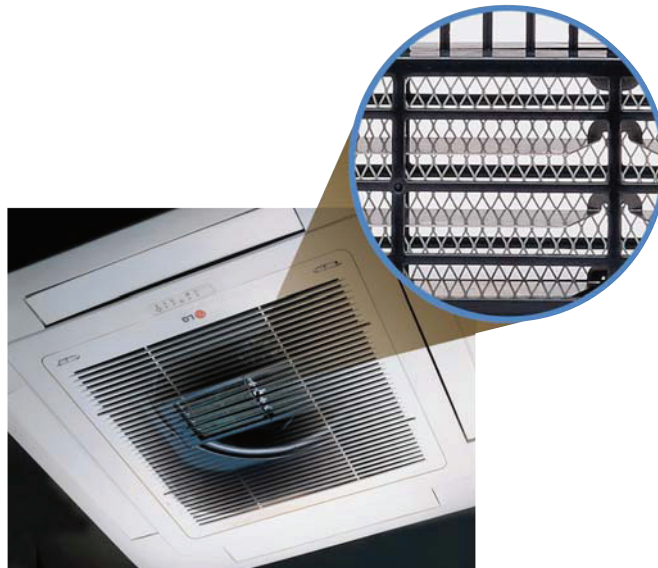
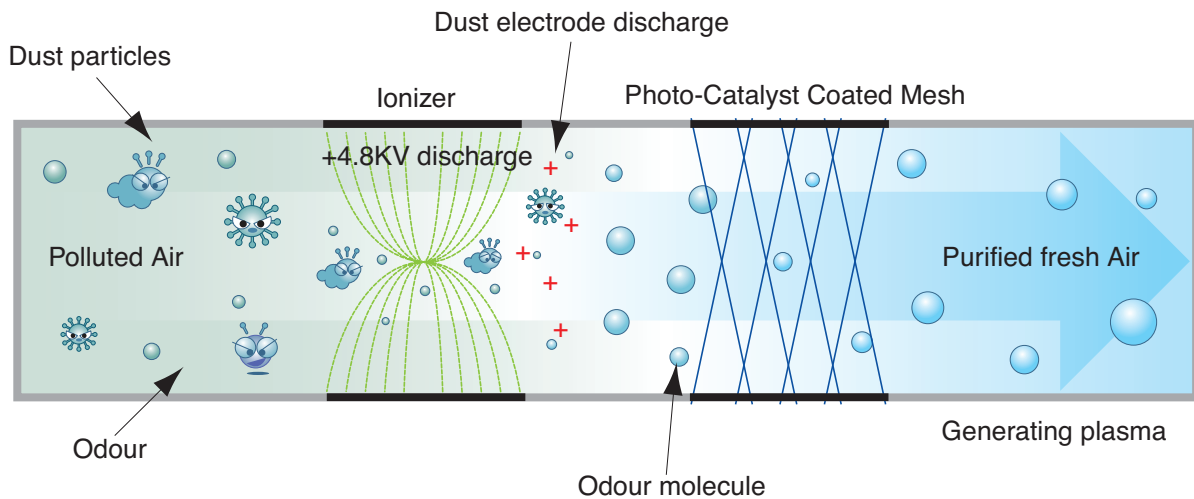
Swirl Swing (New)

Vane 1	Close	Open	Close	Open	Close
Vane 2	Open	Close	Open	Close	Open
Vane 3	Close	Open	Close	Open	Close
Vane 4	Open	Close	Open	Close	Open
	Time				

### 3. Air purifying

#### 3.1 PLASMA Air Purifying System

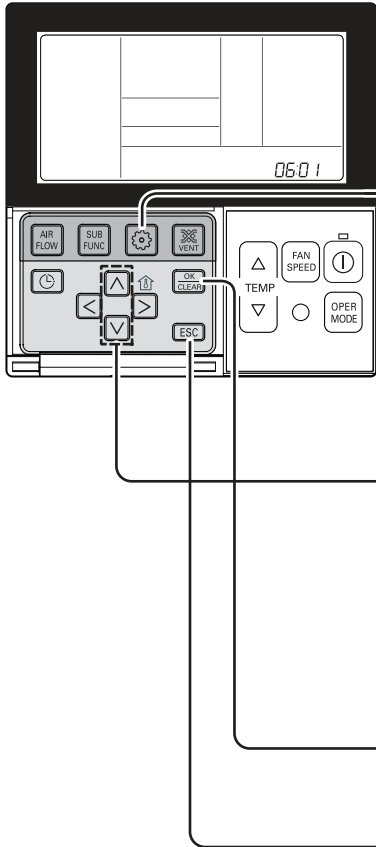
The PLASMA Air Purifying System not only removes microscopic contaminants and dust, but also removes house mites, pollen, and pet fur to help prevent allergic diseases like asthma. This filter that can be used over and over again by simply washing with water.




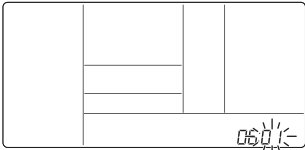


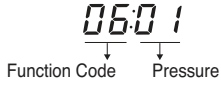







## 4. Installation Functions

### 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.



- Press  button for 4 seconds to enter the installer setting mode until timer segment displays "01:01". 
- If pressing  button repeatedly, it moves to static pressure selection menu as picture below. 
- Select static pressure by pressing   button.  
(01:V-H, 02:F-H, 03:V-L, 04:F-L)  
  
- Press  button to save. 
- 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



## Ceiling Concealed Duct – Low static

Table 1

Model	Step	CMM	Static Pressure [mmAq (Pa)]					
			0(0)	1(10)	2(20)	3(29)	4(39)	5(49)
			Setting Value					
			32:01	32:02	32:03	32:04	32:05	32:06
CL09R.N20 CL12R.N20	LOW	7	78	82	87	93	100	107
	MID	8.5	87	91	94	100	108	116
	HIGH	10	96	100	103	109	117	125

Model	Step	CMM	Static Pressure [mmAq (Pa)]					
			0(0)	1(10)	2(20)	3(29)	4(39)	5(49)
			Setting Value					
			32:01	32:02	32:03	32:04	32:05	32:06
CL18R.N20	LOW	10	96	100	103	109	117	125
	MID	12.5	109	113	117	123	130	137
	HIGH	15	120	124	129	134	141	147

Model	Step	CMM	Static Pressure [mmAq (Pa)]					
			0(0)	1(10)	2(20)	3(29)	4(39)	5(49)
			Setting Value					
			32:01	32:02	32:03	32:04	32:05	32:06
CL24R.N30	LOW	12	89	95	102	106	120	130
	MID	16	102	108	115	125	131	139
	HIGH	20	125	131	136	141	144	147

- The above table shows the correlation between the air rates and E.S.P.
- Be sure to set the value referring table 1. Unexpected set value will cause mal-function.
- Table 1 is based at 230 V. According to the fluctuation of voltage, air flow rate varies.

## Ceiling Concealed Duct – Mid static

Table 2

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
CM18R.N10	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
CM24R.N10	LOW	14.5	76	77	85	89	97	106	114	121	124	127	132
	MID	16.5	85	87	90	94	103	111	118	125	128	131	136
	HIGH	18	90	92	95	99	108	115	122	129	132	135	138

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
UM30R.N10	LOW	18	96	102	107	110	114	118	122	125	127	130	132
	MID	20	102	110	114	118	121	125	127	130	133	134	136
	HIGH	22	110	117	121	124	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
UM36R.N20	LOW	24	88	91	95	100	101	108	113	115	118	121	128
	MID	28	93	97	101	105	108	115	118	120	124	127	134
	HIGH	32	101	105	109	112	115	119	123	126	128	133	137

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
UM42R.N20	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

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
UM48R.N30	LOW	28	74	76	79	82	89	92	94	96	99	102	107
	MID	34	78	82	84	89	94	96	98	101	104	106	112
	HIGH	40	83	89	92	94	98	100	102	105	108	110	116

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
UM60R.N30	LOW	40	82	89	92	94	98	100	102	105	108	110	113
	MID	45	90	92	96	98	102	104	106	109	112	114	117
	HIGH	50	94	97	100	104	107	109	112	115	117	119	121

### E.S.P. setting value (reference)

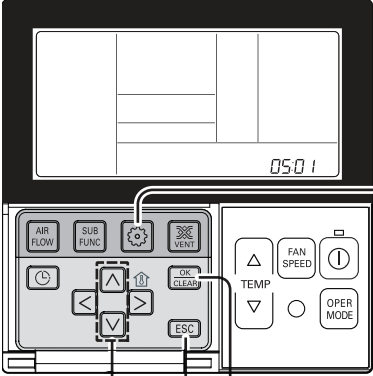
Static pressure(mmAq)		0	1	2	3	4
Model name	Step(Hi/Med/Lo)	Setting value				
AMNH09GB1A2 [MB09AHL N12]	8.5 CMM	75	84	94	104	114
	7.5 CMM	69	77	88	99	110
	6.5 CMM	62	71	83	95	106
AMNH12GB1A2 [MB12AHL N12]	9.5 CMM	82	90	99	109	118
	8.5 CMM	75	84	94	104	114
	7.5 CMM	69	77	88	99	110
AMNH18GB2A2 [MB18AHL N22]	15 CMM	90	97	105	114	122
	13.5 CMM	82	90	99	109	119
	11.5 CMM	75	84	93	103	114
AMNH24GB2A2 [MB24AHL N22]	17 CMM	110	117	125	129	-
	15 CMM	100	107	115	121	127
	13.5 CMM	90	97	105	114	122




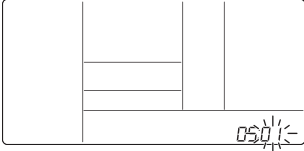









### [ Notes ]

1. To get the desired Airflow & E.S.P. combination from the table set the matching value from the table. Value other than that in table will not give the combinations of airflow & E.S.P. which are mentioned in the table.
2. Table data is based at 230V. According to the fluctuation of voltage, air flow rate varies.

## 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.
$26^{\circ}\text{C} \leq \text{intake air temp.}$	$25^{\circ}\text{C}$
$24^{\circ}\text{C} \leq \text{intake air temp.} < 26^{\circ}\text{C}$	intake air temp. $-1^{\circ}\text{C}$
$22^{\circ}\text{C} \leq \text{intake air temp.} < 24^{\circ}\text{C}$	intake air temp. $-0.5^{\circ}\text{C}$
$18^{\circ}\text{C} \leq \text{intake air temp.} < 22^{\circ}\text{C}$	intake air temp.
intake air temp. $< 18^{\circ}\text{C}$	$18^{\circ}\text{C}$

- 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  $1.0^{\circ}\text{C}$  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

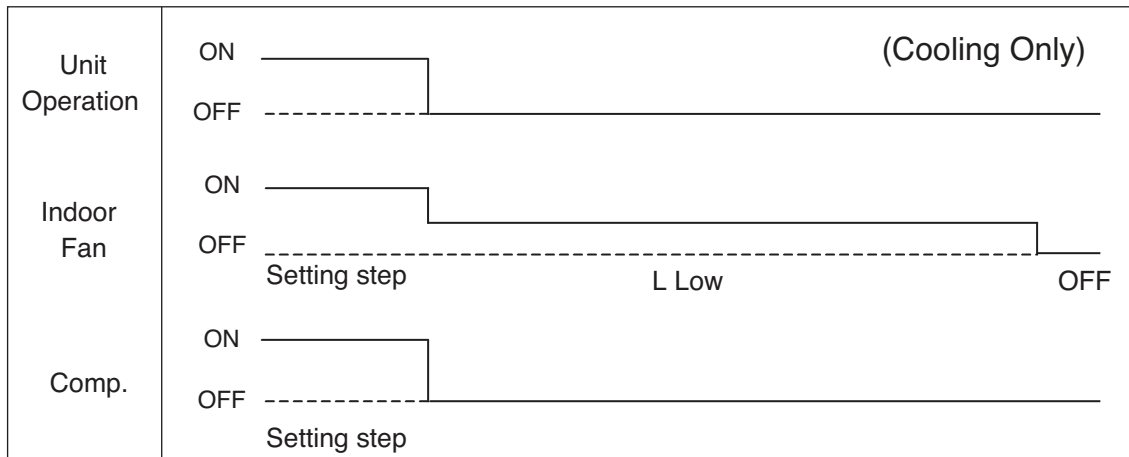
- Operating frequency of compressor depend on the load condition, The difference between the room temp. and set temp., frequency restrictions.
- If compressor operates at some frequency, the operating frequency of compressor cannot be changed within 30 seconds.
- Condition of compressor turned off
  - 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 Operation (Artificial Intelligence)

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temp at that moment as follows.
  - $24^{\circ}\text{C} \leq \text{Intake Air Temp}$  → Fuzzy Operation for Cooling
  - $21^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C}$  → Fuzzy Operation for Dehumidification
  - $\text{Intake Air Temp} < 21^{\circ}\text{C}$  → Fuzzy Operation for Heating
- If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 Seconds or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

### 6.3.1 Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is  $0.5^{\circ}\text{C}$  or more below the setting temp, the compressor is turned off. When  $0.5^{\circ}\text{C}$  or more above the setting temp, the compressor is turned on.
  - Compressor ON Temp → Setting Temp +  $0.5^{\circ}\text{C}$
  - Compressor OFF Temp → Setting Temp -  $0.5^{\circ}\text{C}$
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
  - $26^{\circ}\text{C} \leq \text{Intake Air Temp}$  →  $25^{\circ}\text{C}$
  - $24^{\circ}\text{C} \leq \text{Intake Air Temp} < 26^{\circ}\text{C}$  → Intake Air Temp +  $1^{\circ}\text{C}$
  - $22^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C}$  → Intake Air Temp +  $0.5^{\circ}\text{C}$
  - $18^{\circ}\text{C} \leq \text{Intake Air Temp} < 22^{\circ}\text{C}$  → Intake Air Temp
  - $\text{Intake Air Temp} < 18^{\circ}\text{C}$  →  $18^{\circ}\text{C}$
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

### 6.3.2 Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.  
Compressor ON Temp → Setting Temp + 0.5°C  
Compressor OFF Temp → Setting Temp+0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.  
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
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

### 6.3.3 Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 3°C or more above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.  
Compressor ON Temp → Setting Temp  
Compressor OFF Temp → Setting Temp + 3°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.  
20°C ≤ Intake Air Temp → Intake Air Temp + 0.5°C  
Intake Air Temp < 20°C → 20°C
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

**Notes:** The Temp. of Comp. Turn ON and OFF is different in heating mode and fuzzy operation for heating. Please, refer page 11

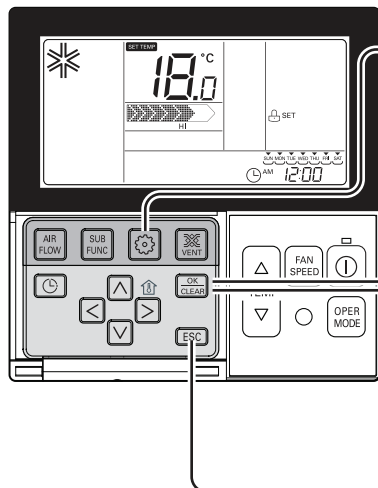
## 6.4 Auto restart Operation

- 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.

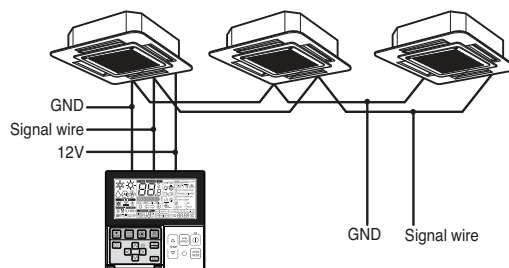
Indoor temp.	Operating Mode	Setting temp.	Setting speed of indoor fan
over 24°C	Cooling	22°C	High speed
21~24°C	Healthy Dehumidification	23°C	
below 21°C	Heating	24°C	

- 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

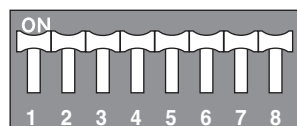
### 1. When installing more than 2 units of air conditioner to one wired remote controller, please connect as the right figure.

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

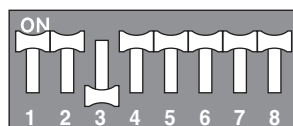


When controlling multiple indoor units with event communication function with one remote controller, you must change the master/slave setting from the indoor unit.

- 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)

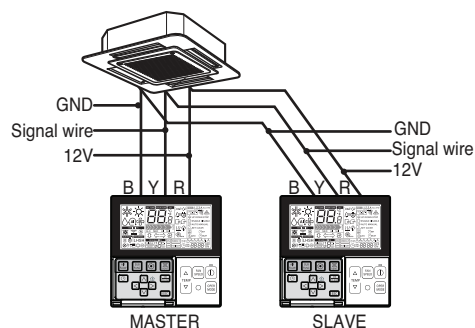


#3 switch ON: Slave

- 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

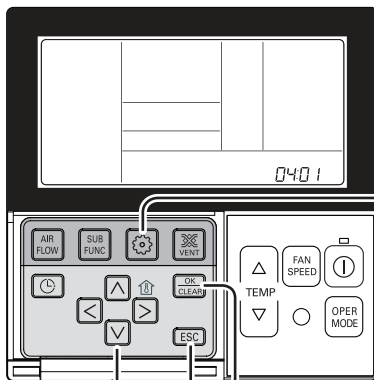
- If necessary, an operator can make an On/Off reservation of the product for a period of one week.
- On/Off schedule of operation for a period of ONE week.
- No need to turn the unit On/OFF manually during working days.  
On/Off time is scheduled in micom of the wired remote control.

**Operation Time Table (Example)**

Setting	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temp.	25°C	25°C	25°C	25°C	25°C	OFF	
On	09:00	08:00	09:00	08:00	09:00		
Off	12:00	17:00	12:00	12:00	12:00		

## 6.11 Two Thermistor Control

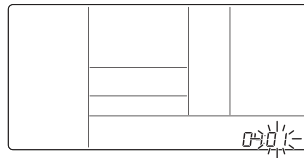
This is the function to select the temperature sensor to judge the room temperature.



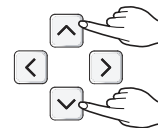
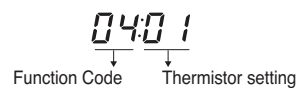
- 1 If pressing button long for 3 seconds, it enters into remote controller setter setup mode.  
- If pressing once shortly, it enters into user setup mode.  
Please press more than 3 seconds for sure.



- 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)



- 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>

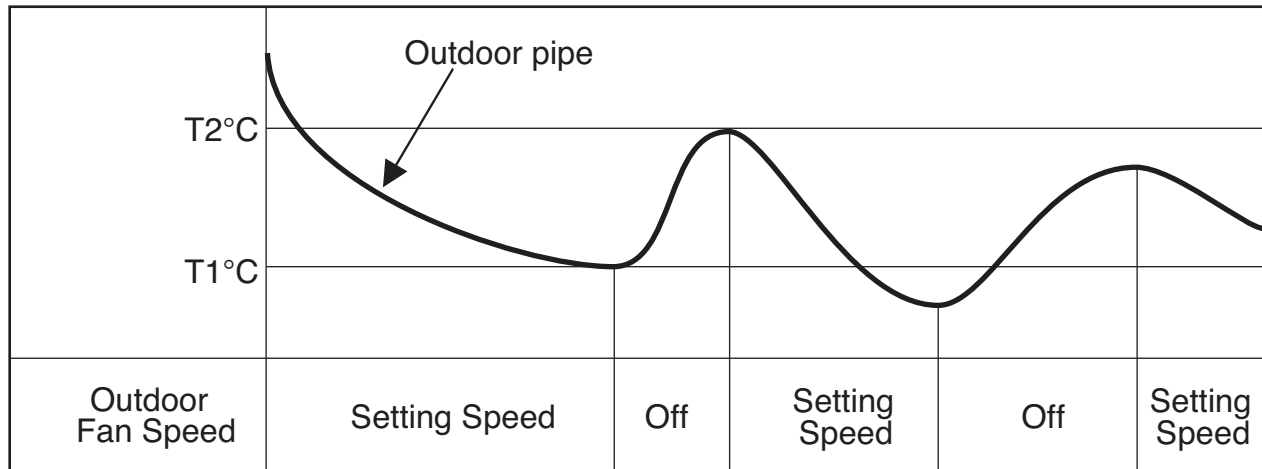
Temperature sensor selection			Function
01	Remote controller		Operation in remote controller temperature sensor
02	Indoor unit		Operation in indoor unit temperature sensor
03	2TH	Cooling	Operation of higher temperature by comparing indoor unit's and wired remote controller's temperature. (There are products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

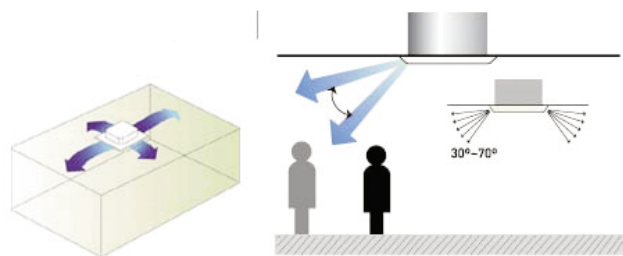
- This Function is for cooling operating in outdoor low temperature .
- If outdoor temperature drops below certain temperature, liquid back is prevented by reducing outdoor fan speed.
- It can prevent frosting of evaporator and keep cooling operation



### 7.2 Space control

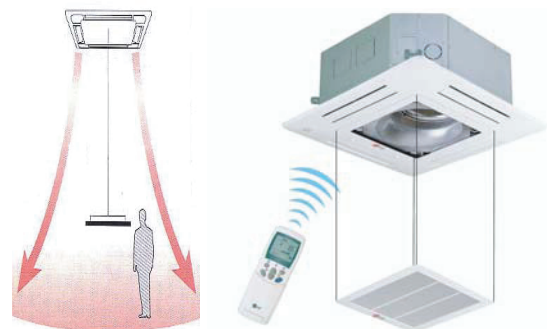
Vanes angle can be controlled by pair, considering its installation environment.

- 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.

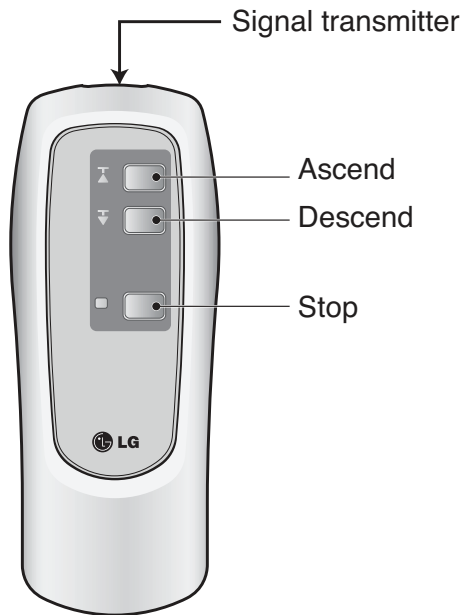


### 7.3 Auto Elevation Grille

- 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

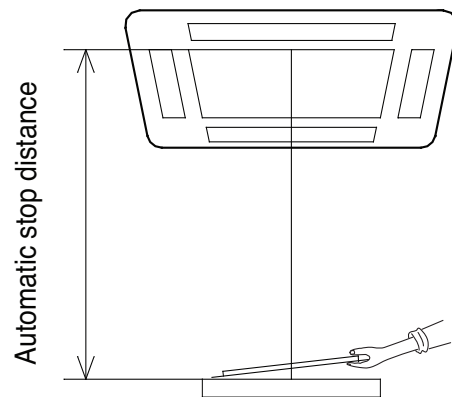
- Depress the down button(▼).  
Then suction grill descends and stops automatically at a certain distance.
- You may stop it at wanted distance point by depressing the stop button (■) when descending.

### 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.

## 7.4 Defrost Control (Heating)

- Defrost operation is controlled by timer and sensing temperature of outdoor pipe.
- The first defrost starts only when the outdoor pipe temperature falls below -11°C after starting of heating operation and more than 10 minutes operation of compressor.
- Defrost ends after 15 minutes passed from starting of defrost operation when the outdoor rises over 40°C even before 12 minutes.
- The second defrost starts only when the outdoor pipe temperature falls below – 6°C after from ending of the first defrost and more than 10 minutes operation of compressor.

### 3. Basic Control

1. Normal operation.....	66
2 Compressor control .....	66
3. EEV( Electronic Expansion Valve) control .....	66
4. Oil return control .....	67
5. Defrost control .....	67



## 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.

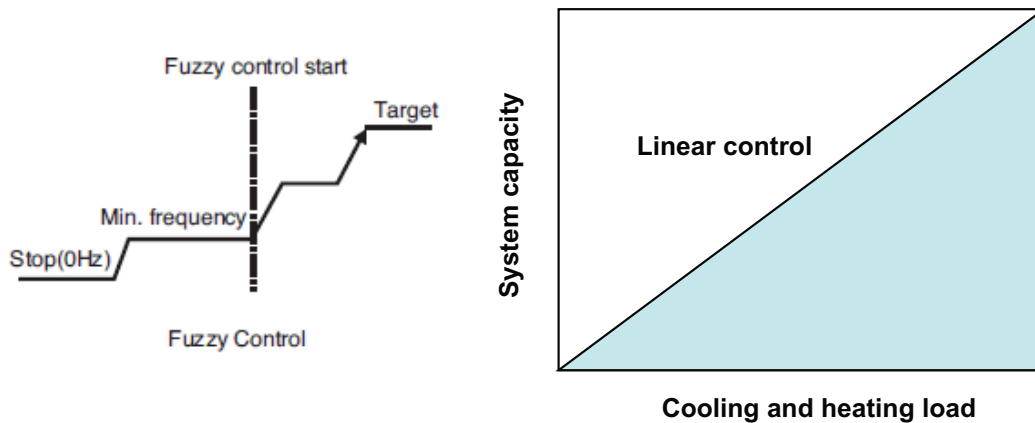
Actuator	Cooling operation	Heating operation	Stop state
Compressor	Fuzzy control	Fuzzy control	Stop
Fan	Fuzzy control	Fuzzy control	Stop
EEV	Super heating fuzzy control	Super heating & Sub cooling fuzzy control	Min. Pulse

※ 14,16k Models

Frequency that corresponds to each rooms capacity will be determined according to the difference in the temperature of each room and the temperature set by the remote controller. There are various factors determining the frequency.

## 2. Compressor control

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



Inverter linear control as cooling and heating load increasing

※ 14, 16k Models

Capacity steps of compressor are decided by summation of capacity code, outdoor temp., indoor temp., step compensation of temperature difference indoor temp. and setting temp.

## 3. EEV( Electronic Expansion Valve) control

EEV operates with fuzzy control rules to keep the degree of superheat (about 2~3°C) at the evaporator outlet status.

The degree of superheat =  $T_{\text{suction}} - T_{\text{evaporation}}$

$T_{\text{suction}}$  : temperature at suction pipe sensor(°C)

$T_{\text{evaporation}}$  : evaporation temperature (°C)

※ 14, 16k Models

EEV operates with PI control rules to keep the degree of superheat at the evaporator inlet and outlet status.

## 4. Oil return control

Oil return operation recovers oil amount in compressor by collecting oil accumulated in pipe. Each cycle component operates as shown on the below table during oil return operation.

### Outdoor unit

Component	Starting	Running	Ending
Compressor	Normal control	Setting value	Normal control
Fan	Normal control	Off	Normal control
EEV (Thermo on)	Normal control	Setting value	Normal control
EEV (Thermo off)	Min. Pulse	Setting value	Min. Pulse
4 way valve	On	Off	On

### Indoor unit

Component	Starting	Running	Ending
Fan	Normal control	Off	Normal control
Defrost signal	Off	On	Off

## 5. Defrost control

Defrost operation eliminates ice accumulated on heat exchanger, recovering performance of heat exchanger. Each cycle component operates as shown on the below table during defrost operation.

### Outdoor unit

Component	Starting	Running	Ending
Compressor	Normal control	Setting value	Normal control
Fan	Normal control	Off	Normal control
EEV (Thermo on)	Normal control	Setting value	Normal control
EEV (Thermo off)	Min. Pulse	Setting value	Min. Pulse
4 way valve	On	Off	On

### Indoor unit

Component	Starting	Running	Ending
Fan	Normal control	Off	Normal control
Oil return signal	Off	On	Off

# 4. Test Run

1. Check before Test Run.....69

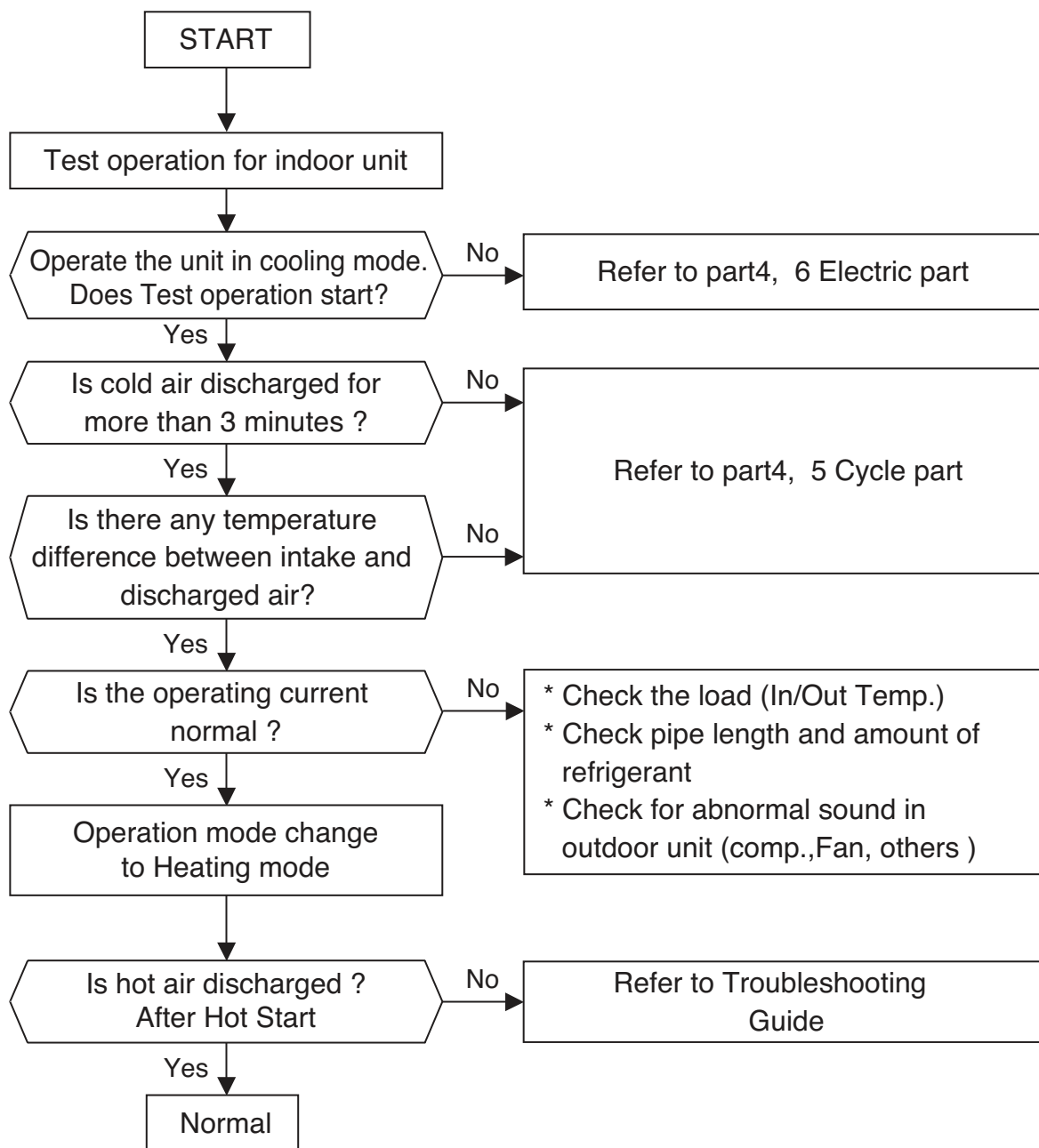
2. Test Run Flow chart .....70

3. Test Running.....71

## 1. Check before Test Run

1	Check to see whether there is any refrigerant leakage, and check whether the power or transmission cable is connected properly.
2	<p>Check liquid pipe and gas pipe valves are fully opened.</p> <p><b>NOTE:</b> Be sure to tighten caps.</p>
3	<p>Confirm that 500 V megger shows 2.0 MΩ or more between power supply terminal block and ground. Do not operate in the case of 2.0 MΩ or less.</p> <p><b>NOTE:</b> Never carry out mega ohm check over terminal control board. Otherwise the control board may break.</p> <p>Immediately after mounting the unit or after leaving it turned off for an extended length of time, the resistance of the insulation between the power supply terminal board and the ground may decrease to approx. 2.0 MΩ as a result of refrigerant accumulation in the internal compressor.</p> <p>If the insulation resistance is less than 2.0 MΩ, turn on the main power supply.</p>

## 2. Test Run Flow chart



- Each indoor unit should be tested.
- If the unit has accessory, it should be tested.

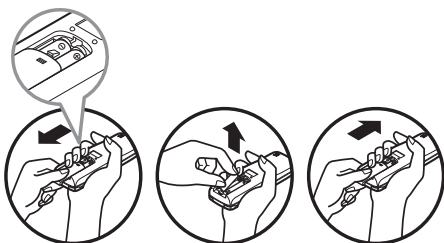
### 3. Test Running

#### 3.1 SPLIT, ART cool, ART cool deluxe Type

- Check that all tubing and wiring have been properly connected.
- Check that the gas and liquid side service valves are fully open.

##### 3.1.1 Prepare remote controller

- 1 Remove the battery cover by pulling it according to the arrow direction.
- 2 Insert new batteries making sure that the (+) and (–) of battery are installed correctly.
- 3 Reattach the cover by pushing it back into position.



##### NOTE:

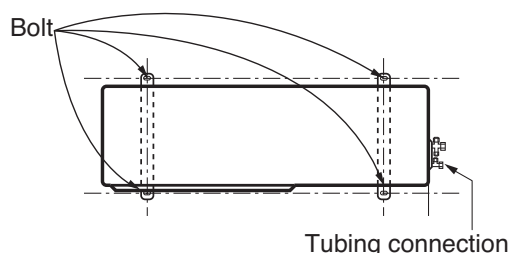
- Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote controller if the system is not going to be used for a long time.

##### 3.1.2 Precautions in test run

- The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner should not be operated.
- For test run, carry out the cooling operation firstly even during heating season. If heating operation is carried out firstly, it leads to the trouble of compressor. Then attention must be paid.
- Carry out the test run more than 5 minutes without fail. (Test run will be cancelled 18 minutes later automatically)
- The forced operation is started by pressing button for 2 seconds. The test run is started by pressing button for 3~6 seconds.
- To cancel the test run, press any button.

##### 3.1.3 Settlement of outdoor unit

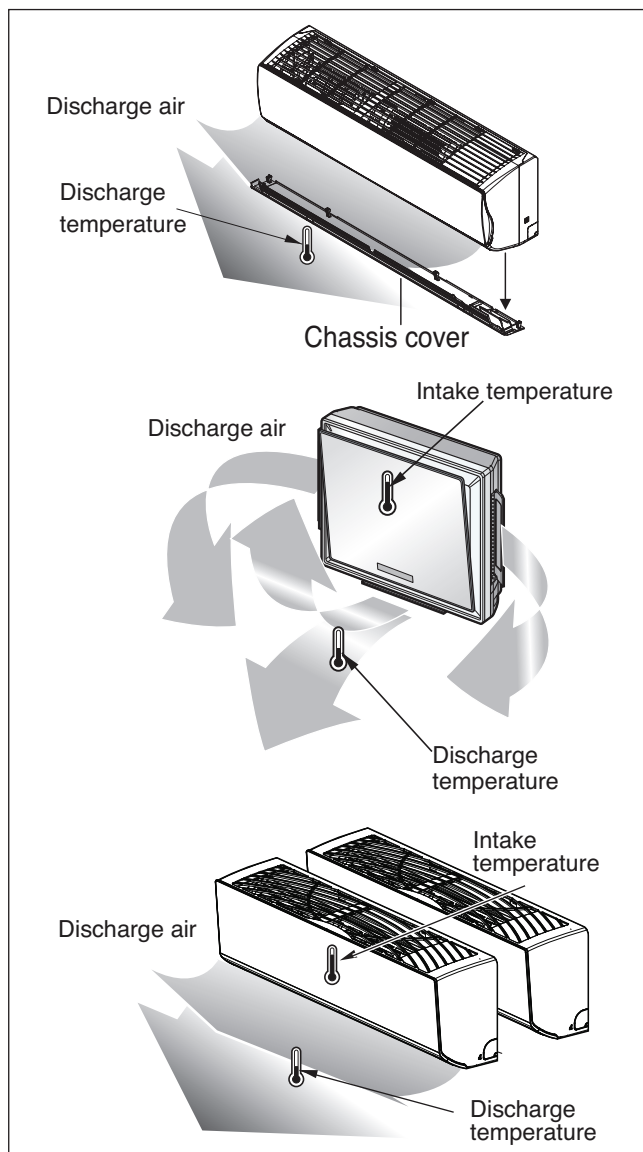
- Anchor the outdoor unit with a bolt and nut(ø10mm) tightly and horizontally on a concrete or rigid mount.
- When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- In the case when the vibration of the unit is conveyed to the hose, secure the unit with an anti-vibration rubber.



##### 3.1.4 Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of the gas side service valve.
2. Measure the temperature of the intake and discharge of air.
3. Ensure the difference between the intake temperature and the discharge is more than 8°C (Cooling) or reversely (Heating).



### 3.2 CVT Type

#### 3.2.1 Connection of power supply

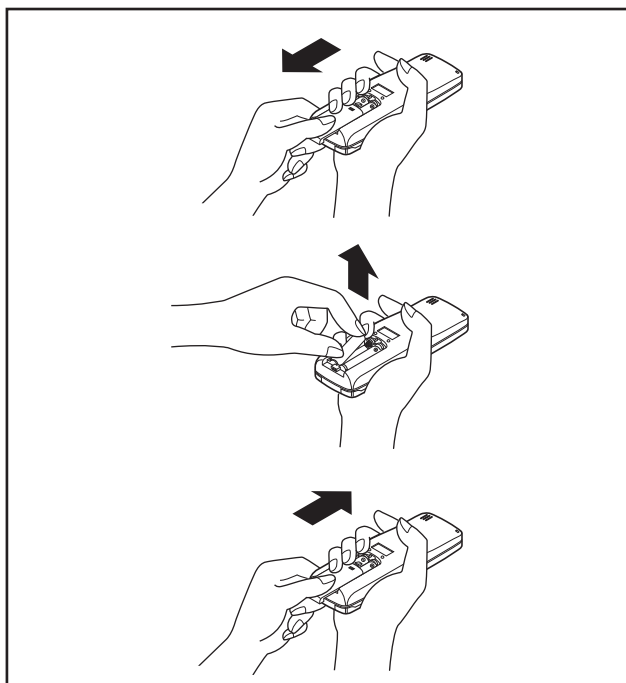
##### 1) Connect the power supply cord to the independent power supply.

- Circuit breaker is required.

##### 2) Prepare the remote control.

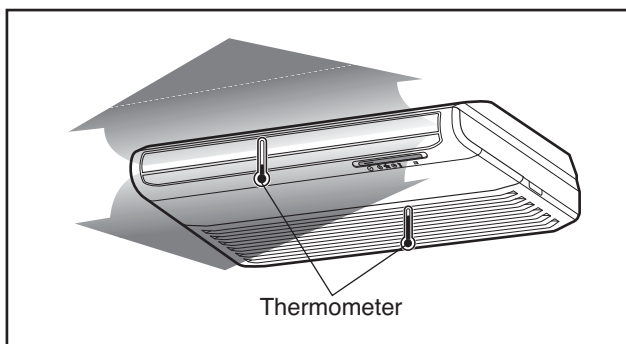
- Insert two batteries provided.  
Remove the battery cover from the remote controller.
- Slide the cover according to the arrow direction.  
Insert the two batteries.  
(Two "R03" or "AAA" dry-cell batteries or equivalent.)
- Be sure that the (+) and (-) directions are correct.
- Be sure that both batteries are new.  
Re-attach the cover.
- Slide it back into position.

##### 3) Operate the unit for fifteen minutes or more.



#### 3.2.2 Evaluation of the performance

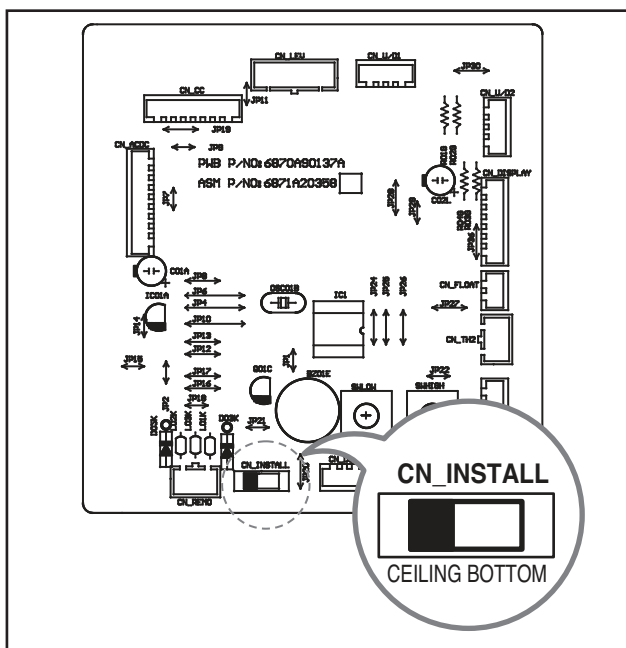
- 1) Measure the temperature of the intake and discharge air.
- 2) Ensure the difference between the intake temperature and the discharge one is more than 8°C (Cooling) or reversely (Heating).



#### 3.2.3 Selection of the slide switch according to installation method

- 1) In case the indoor unit is installed on the floor, please change the side switch which is on the Main PCB Assembly to the 'BOTTOM' state.
- 2) In case the indoor unit is installed under the ceiling, please change the slide switch which is on the Main PCB Assembly to the 'CEILING' state.

※ The initial state of the slide switch is set for the bottom installation.



## 3.3 Ceiling Cassette Type

### 3.3.1 PRECAUTIONS IN TEST RUN

- The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner should not be operated.

#### CAUTION:

- ① For test run, carry out the cooling operation first even during winter season. If heating operation is carried out first, it leads to the trouble of compressor.
  - ② Carry out the test run more than 5 minutes without stopping.  
(Test run will be cancelled 18 minutes later automatically)
- The test run is started by pressing the room temperature checking button and down timer button for 3 seconds at the same time.
  - To cancel the test run, press any button.

### 3.3.2 CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measured data, etc.
- Measuring data are room temperature, outside temperature, suction temperature, blow out temperature, air velocity, air volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature.
  - As to the structure and appearance, check following items.

- ☐ Is the circulation of air adequate?
- ☐ Is the drainage OK?
- ☐ Is the heat insulation complete  
(refrigerant and drain piping)?
- ☐ Is there any leakage of refrigerant?

- ☐ Does the remote controller works properly?
- ☐ Is there any error on wiring?
- ☐ Aren't terminal screws loosened?

M4.....118N.cm{12kgf.cm} M5.....196N.cm{20kgf.cm}  
M6.....245N.cm{25kgf.cm} M8.....588N.cm{60kgf.cm}



## 5. Trouble Shooting

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## 1. Self-diagnosis Function

### 1.1 Error Indicator (Indoor)

#### 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.

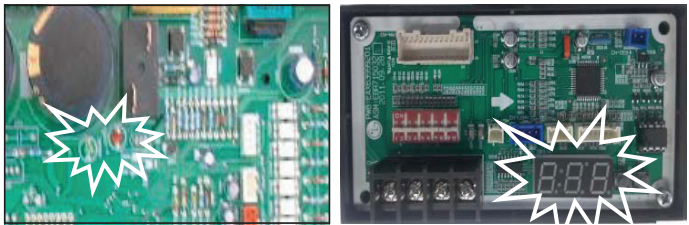
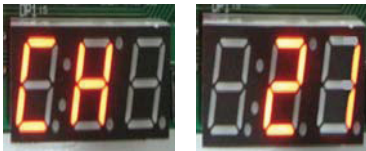
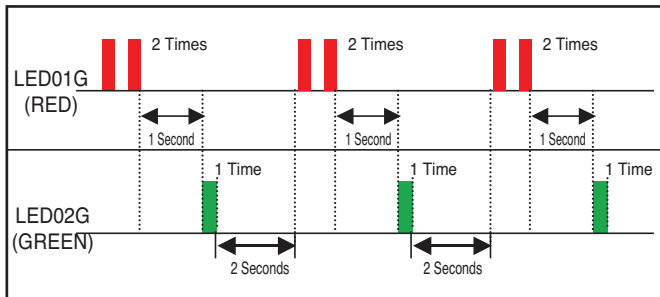
#### Indoor Error

Error code	Description	Indoor Status
00	No Error	ON
01	Indoor Room themistor error	OFF
02	Indoor in-piping sensor error	OFF
03	Remote controller error	OFF
04	Drain Pump error	OFF
05	Communcation error between in and out	OFF
06	Indoor Out-Piping sensor error	OFF
07	Differnt mode operation	OFF
09	EEPROM Check Sum Error	OFF
10	Indoor BLDC Fan Lock	OFF

### 1.3 Error Indicator (Outdoor)

Outdoor Error

Ex) Error 21 (DC Peak)

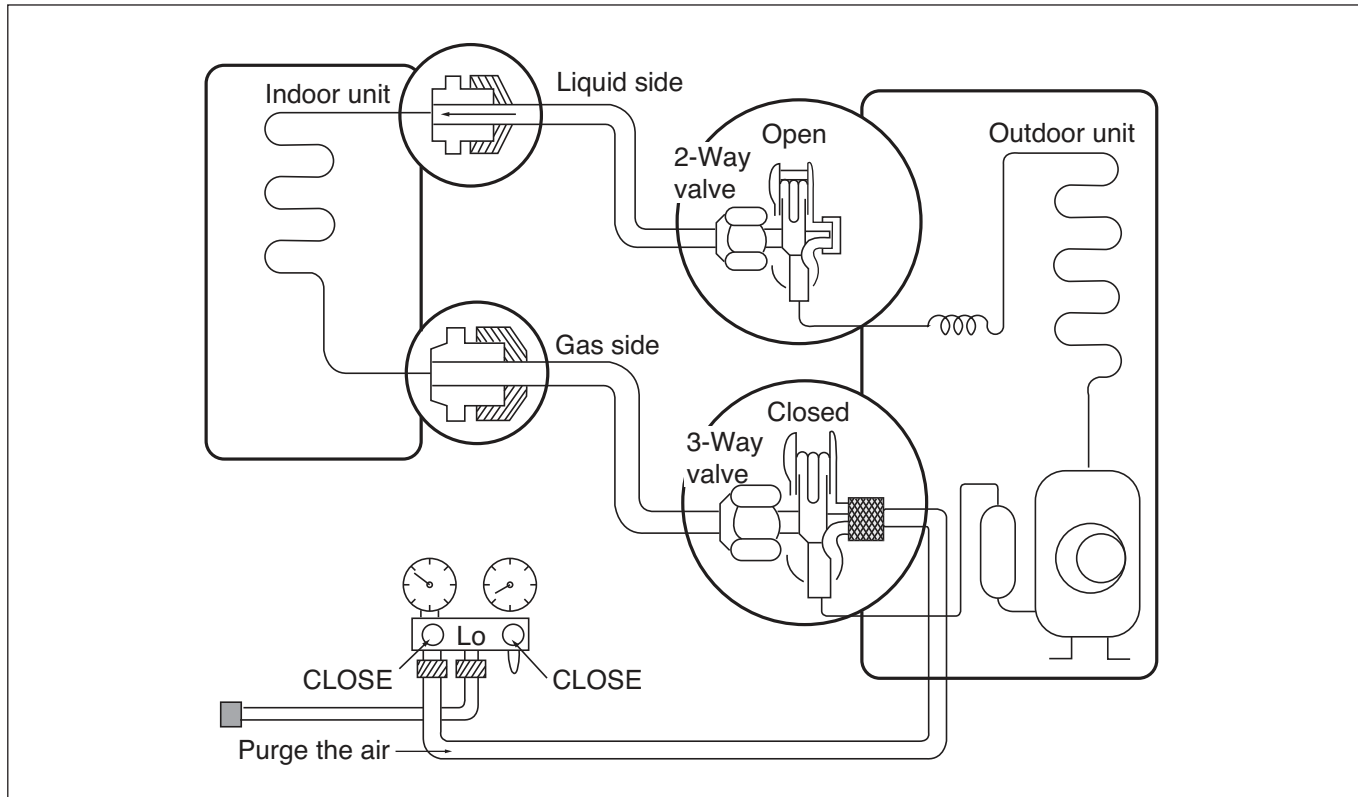


Error Code	Contents	LED01G/M (Red)	LED02G/M (Green)	case of Error	Outdoor Status
21	DC Link Peak (IPM Fault)	2times ●	1times ●	Over Rated Current	Off
22	CT 2 (Max CT)	2times ●	2times ●	Input Over Current	Off
23	DC Link Low Volt.	2times ●	3times ●	DC Link Volt is below 140Vdc	Off
	DC Link High Volt.			DC Link Volt is above 420Vdc	
25	Low Voltage/Over Voltage	2times ●	5times ●	Abnormal AC Volt Input	Off
26	DC Compressor Position Error	2times ●	6times ●	Compressor Starting Fall Error	Off
27	PSC/PFC Fault Error	2times ●	7times ●	Over Inverter PCB input current	Off
29	COMP Over Current	2times ●	9times ●	Over Inverter Compressor Current	Off
32	D-Pipe High	3times ●	2times ●	D-Pipe Temp. High	Off
35	Low Pressure Error	3times ●	5times ●	Excessive decrease of Low Pressure	Off
39	Communication Error	3times ●	9times ●	Communication Error Between PFC Micom and INV Micom	Off
40	CT Sensor (Open/Short)	4times ●	○	CT Circuit Malfunction	Off
41	INV. D-Pipe Th Error	4times ●	1times ●	Open/Short	Off
43	High Pressure Sensor Error	4times ●	3times ●	Open/Short	Off
44	Outdoor Air Th Error	4times ●	4times ●	Open/Short	Off
45	Cond. Mid-Pipe Th Error	4times ●	5times ●	Open/Short	Off
46	Suction Pipe Th Error	4times ●	6times ●	Open/Short	Off
48	Cond. Out-Pipe Th Error	4times ●	8times ●	Open/Short	Off
51	Capacity Over	5times ●	1times ●	Over combination	Off
53	Signal Error (Indoor <-> Outdoor)	5times ●	3times ●	Communication Poorly	Off
54	3-Phase Wrong wiring	5times ●	4times ●	3-Phase Wrong Wring of Outdoor Unit (Reverse Phase/Omission of Phase)	Off
60	EEPROM Check Sum Error	6times ●	○	Check Sum Mismatching	Off
61	Cond. Pipe Th High	6times ●	1times ●	Cond. Temp. High	Off
62	Heaksink Th High	6times ●	2times ●	Heatsink Temp. High	Off
65	Heaksink Th Error	6times ●	5times ●	Open/Short	Off
67	Outdoor BLDC Fan Lock	6times ●	7times ●	Outdoor Fan is not operation	Off
73	PFC Fault Error(S/W)	7times ●	3times ●	Over Current of Outdoor Unit PFC	Off

● : A light on the display panel is blink.

## 2. Pump Down

### 2.1 14k/16k



#### • Procedure

- (1) **Confirm that both the 2-way and 3-way valves are set to the open position.**
  - Remove the valve stem caps and confirm that the valve stems are in the raised position.
  - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) **Operate the unit for 10 to 15 minutes.**
- (3) **Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.**
  - Connect the charge hose with the push pin to the service port.
- (4) **Air purging of the charge hose.**
  - Open the low-pressure valve on the charge set slightly to air purge from the charge hose.
- (5) **Set the 2-way valve to the closed position.**
- (6) **Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kg/cm<sup>2</sup>g.**
- (7) **Immediately set the 3-way valve to the closed position.**
  - Do this quickly so that the gauge ends up indicating 3 to 5kg/cm<sup>2</sup>g.
- (8) **Disconnect the charge set, and mount the 2-way and 3-way valve's 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.

### 2.2 18k~56k

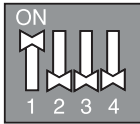
This function gathers the refrigerant present in the system to ODU

Use this function to store refrigerant of system in ODU for leakage or IDU replacement.

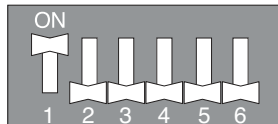
#### • Procedure

##### ■ This function start DIP switch setting status of ODU PCB.

(1) Set the DIP switch as follow after shutting the power source down.



Standard Inverter : 18k/24k/30k  
Compact Inverter : 24k/30k/36k



Standard Inverter : 36k/42k/48k/60k

(2) Reset the power.

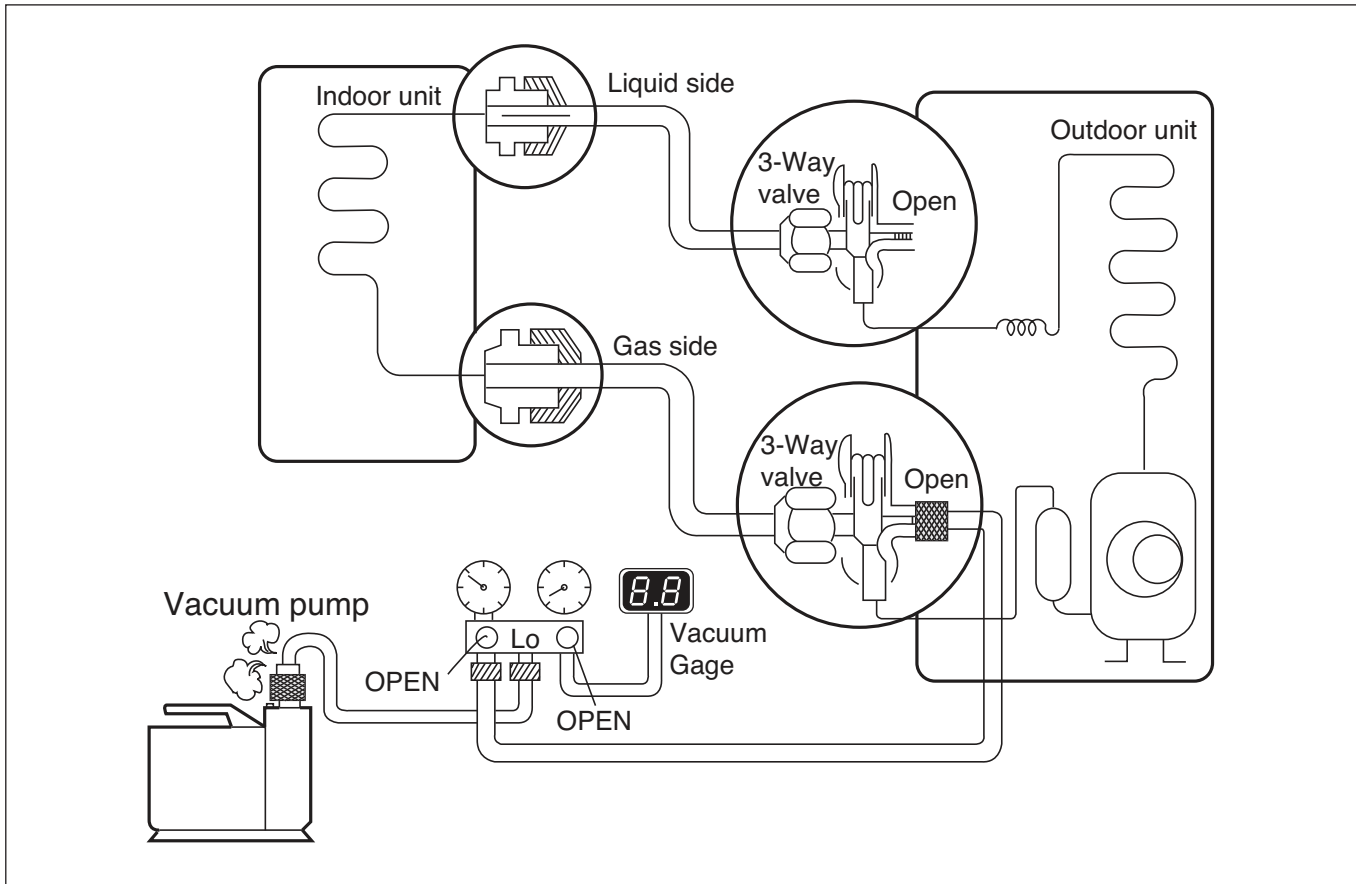
(3) Check that the Red LED of PCB is on during work.(The indoor unit is operated by force.)

(4) Pump down during forced cooling operation.

#### CAUTION

1. Use pump down function within guaranteed temperature range  
IDU : 20~32C  
ODU : 0~40C
2. Make certain that IDU doesn't run with thermo off mode during operation
3. After the compressor is starting operation, please complete Pump Down within 4 minutes.
4. Pump Down can be stopped (The compressor is turned off), because of compressor protection.  
In this case, reset the power.

### 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.

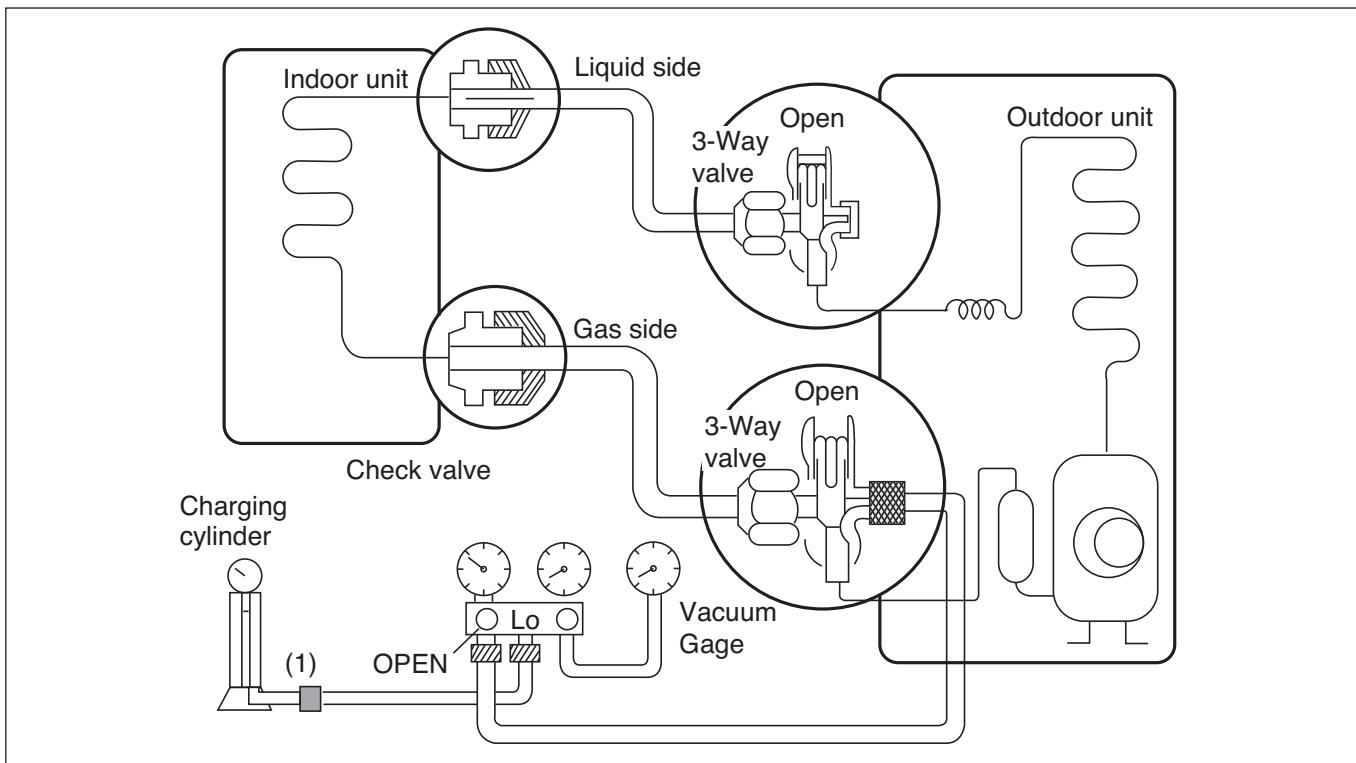


#### WARNING

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

### NOTICE

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.

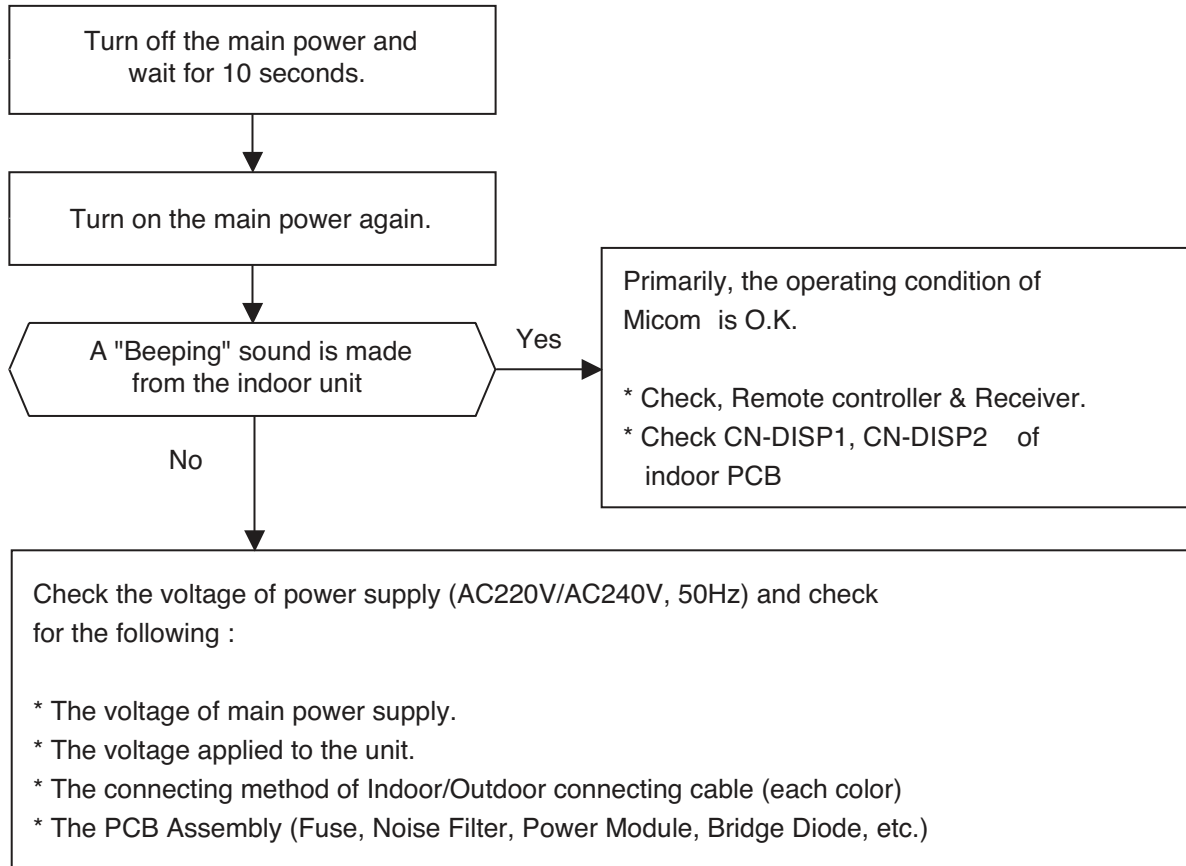
### NOTICE

1. The suction pressure is usually 8.5~9.5kg/cm<sup>2</sup>G(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.



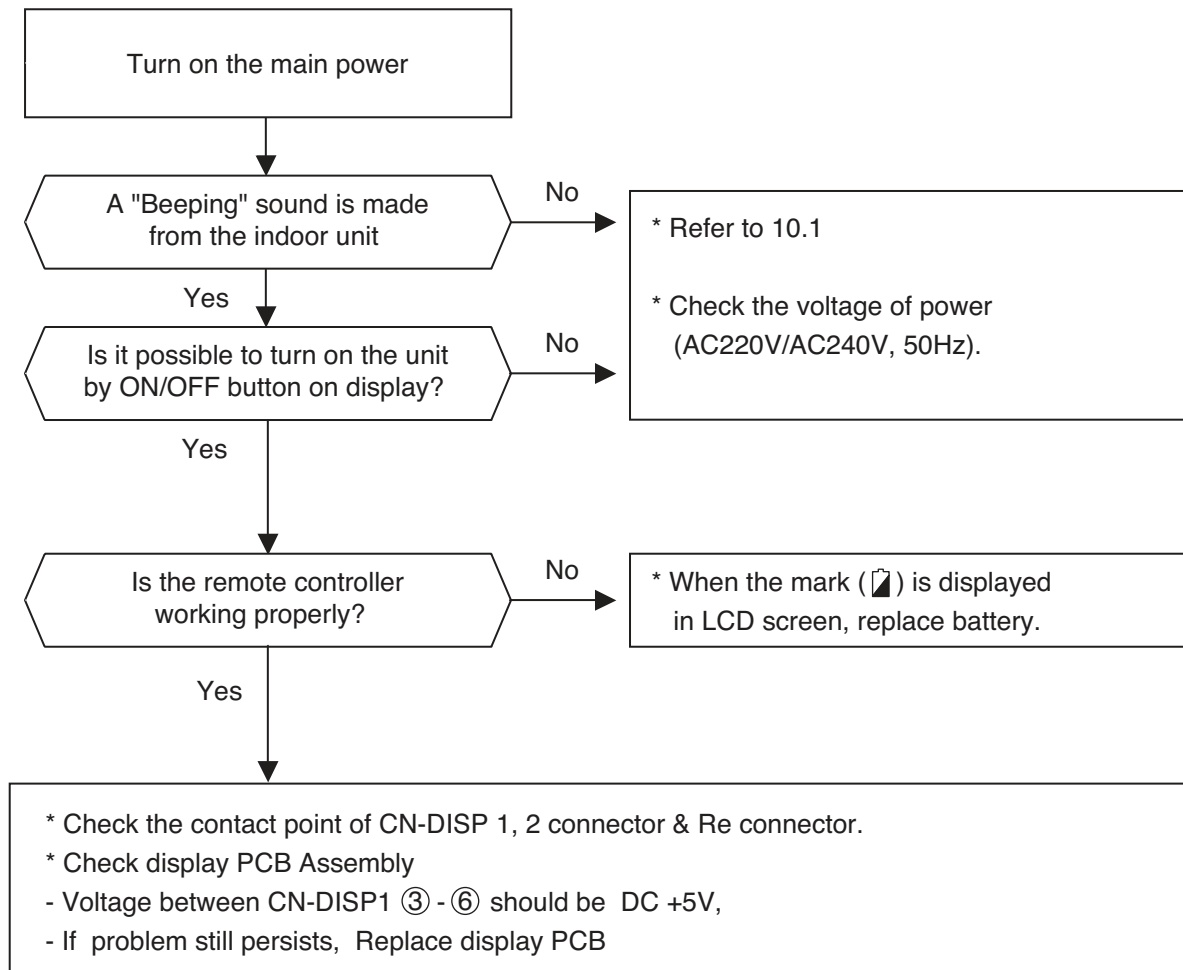
## 6. Electronic Parts

### 6.1 The Product doesn't operate at all

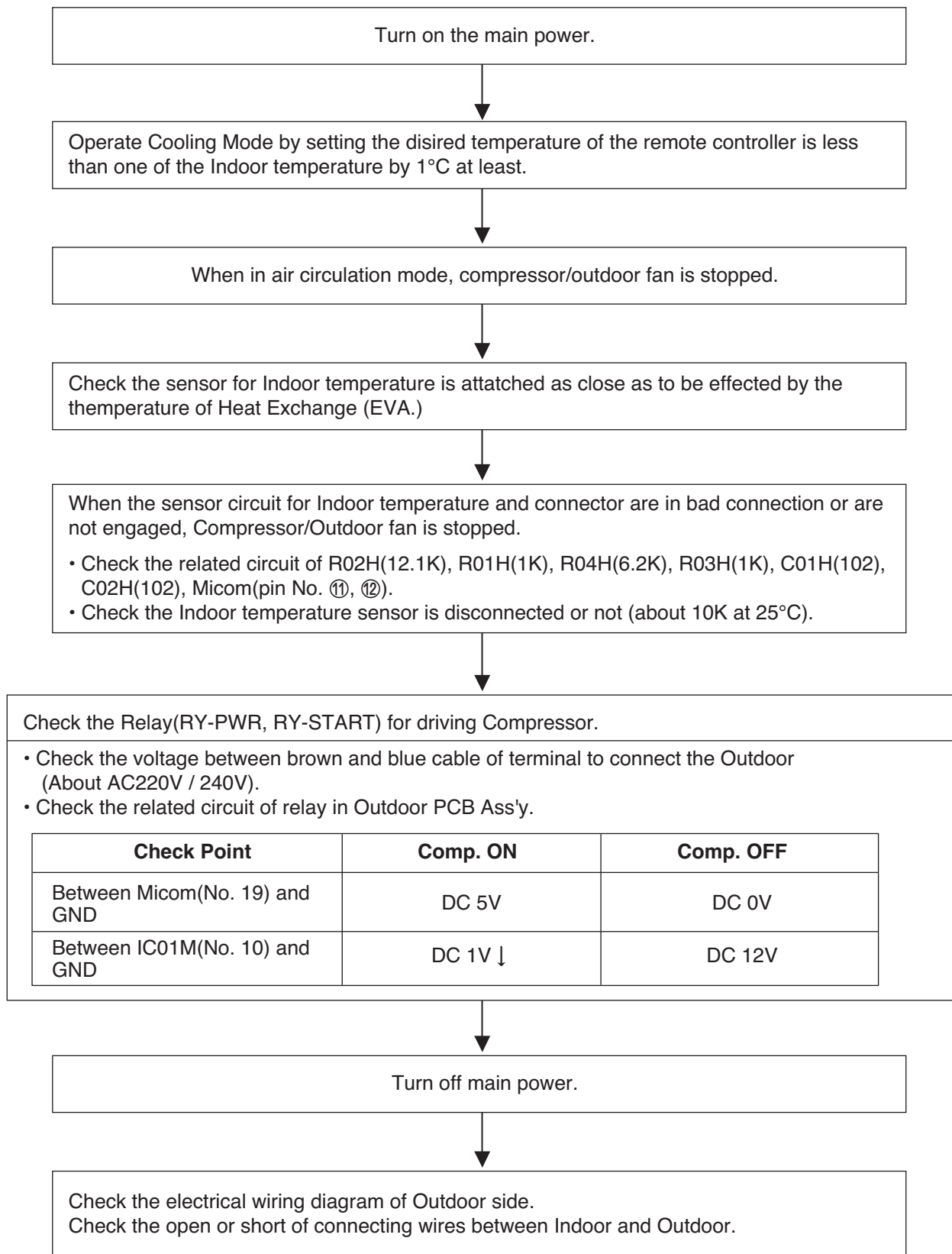


The operation check of the Indoor PCB Assembly		
Procedure	Specification	Remedy
1) The input voltage of power module.	1) AC230V $\pm$ 30V : Check the rated voltage	1) Check the power outlet.
2) The output voltage of power module.	2) 12V $\pm$ 3V	2) Replace PCB Assembly
4) IC04D(7805)	4) DC5V	4) Replace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

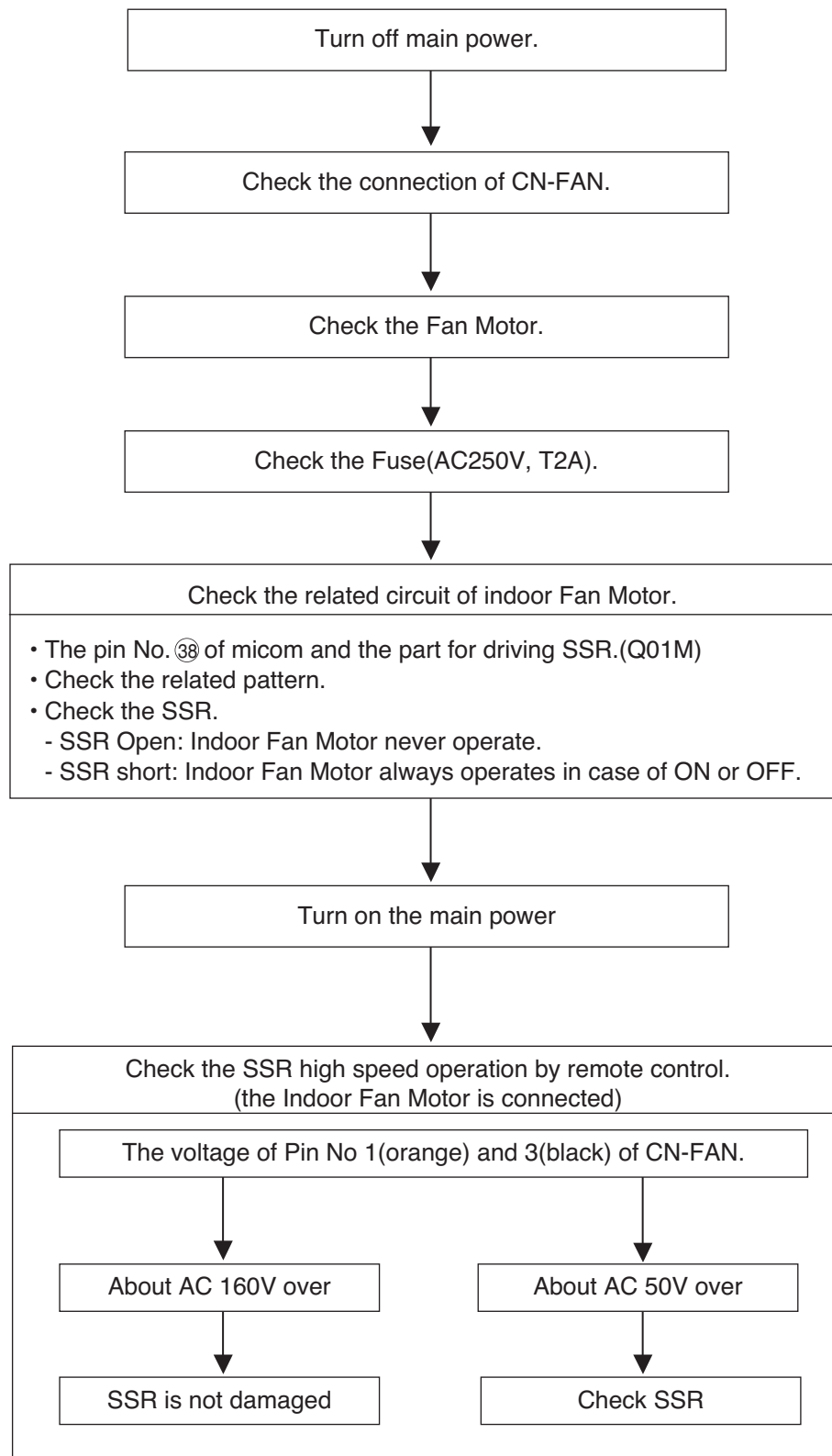
## 6.2 The Product doesn't operate with the remote controller



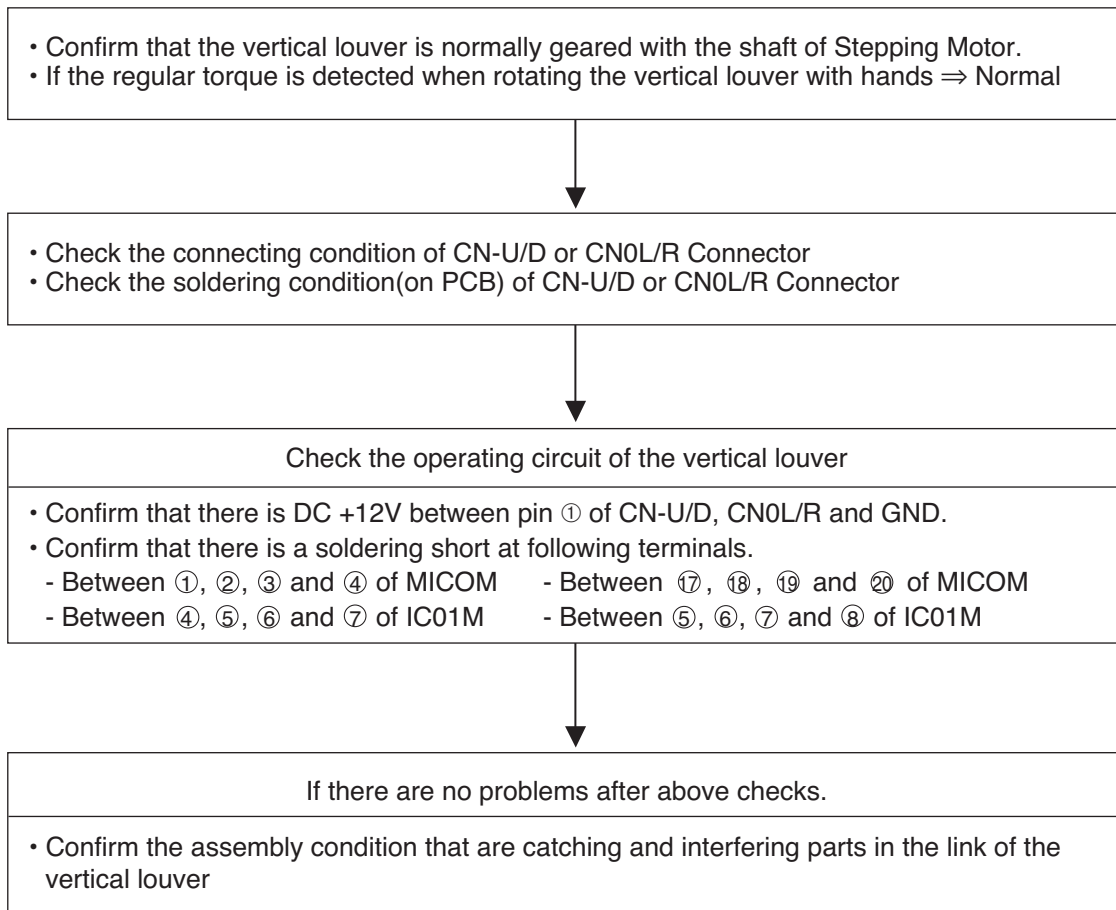
## 6.3 The Compressor/Outdoor Fan are don't operate



## 6.4 When indoor Fan does not operate.



## 6.5 When the louver does not operate.



## 6.6 Troubleshooting Indoor Error

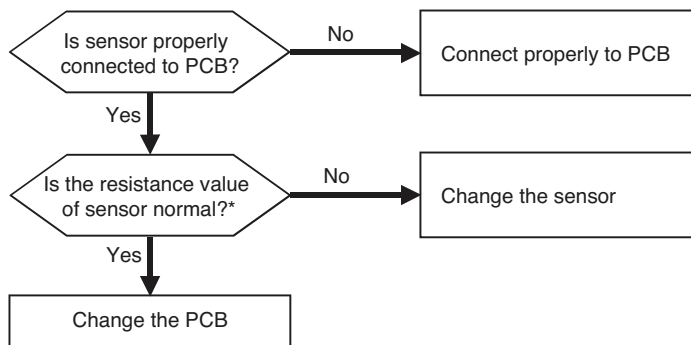
CH 01 (Indoor unit air sensor error)

CH 02 (Indoor unit pipe inlet sensor error)

CH 06 (Indoor unit pipe outlet sensor error)

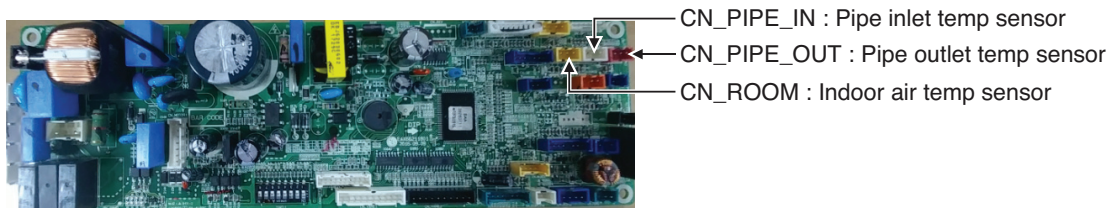
Error No.	Error Type	Error Point	Main Reasons
01	Indoor unit air sensor error	Indoor unit sensor is open/ short	1. Indoor unit PCB wrong connection 2. Indoor unit PCB failure 3. Sensor problem (main reason)
02	Indoor unit pipe inlet sensor error		
06	Indoor unit pipe outlet sensor error		

### ■ Error diagnosis and countermeasure flow chart



\*\* In case the value is more than 100 k $\Omega$  (open) or less than 100  $\Omega$  (short), Error occurs

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



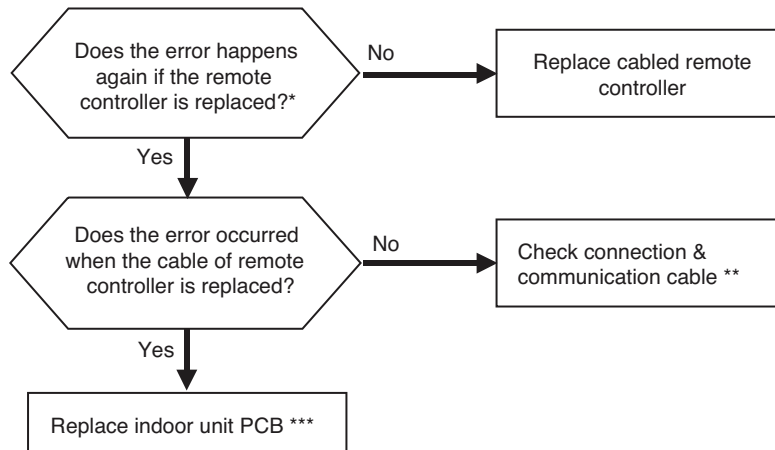
Measure the resistance of outlet pipe temp sensor.

## 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

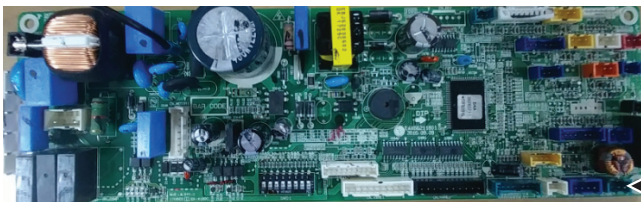
#### ■ Error diagnosis and countermeasure flow chart



\* 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.



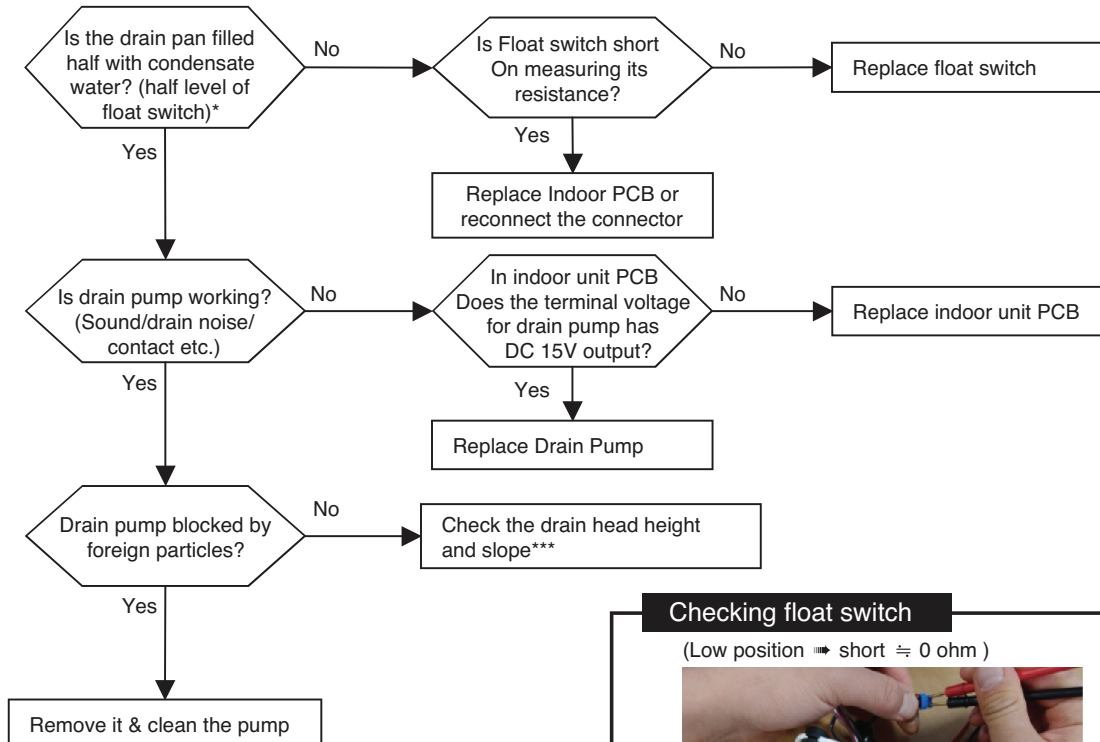
Checking communication cable connection status

## 6.6 Troubleshooting Indoor Error

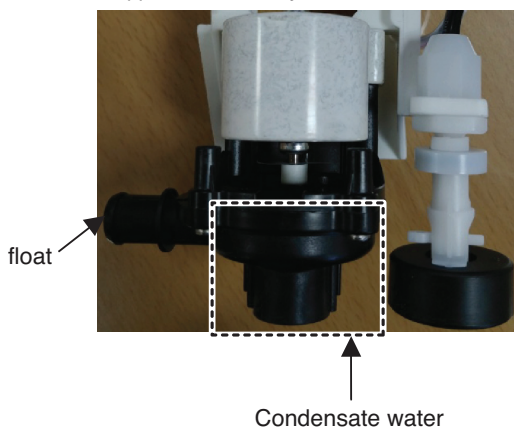
### CH 04 (Drain pump error)

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

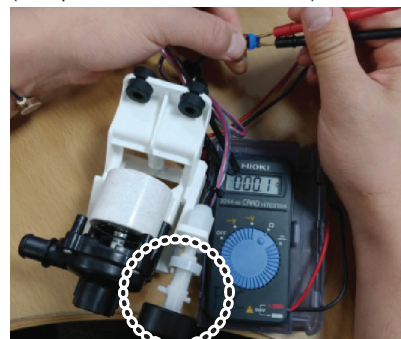


\* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.

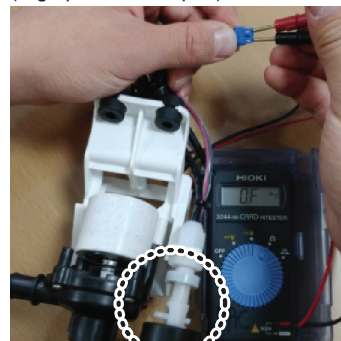


#### Checking float switch

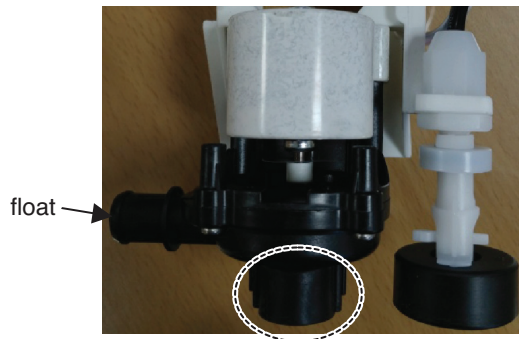
(Low position → short ≈ 0 ohm )



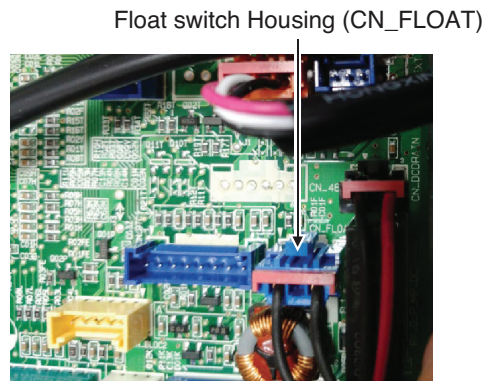
(High position → Open)





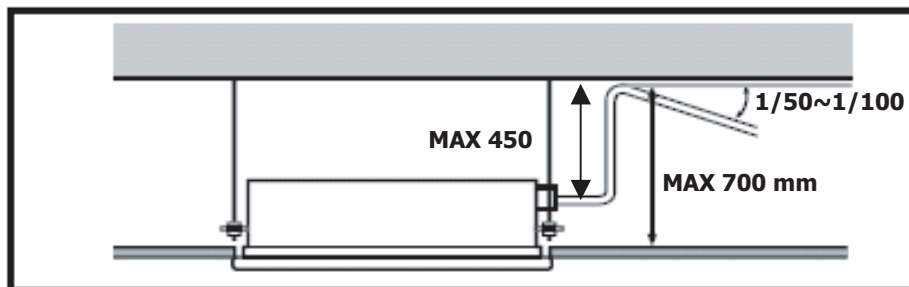


Point to check rotating



\*\*\* Indoor PCB drain pump connector  
(Check input of DC 15 V)  
(Marked as CN\_DCDRAIN)

[\*\*\*] 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

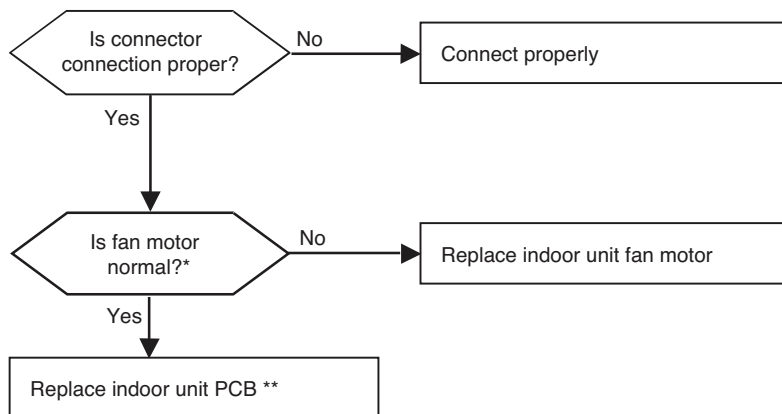
- Replace the indoor unit PCB, and then make sure to perform Auto addressing and input the address of central control

## 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 seconds)	1. Motor connector connection fault 2. Indoor PCB fault 3. Motor fault

#### ■ Error diagnosis and countermeasure flow chart



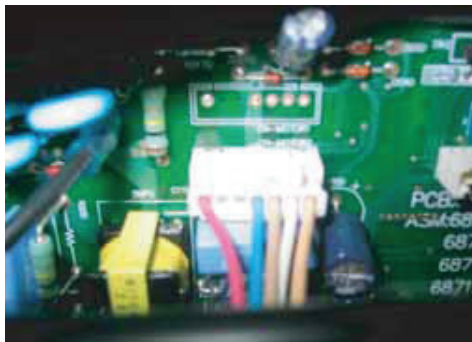
\* It is normal when check hall sensor of indoor fan motor as shown below



Each terminal with the tester

Tester		Normal Resistance (±10 %)
+	-	
①	④	∞
⑤	④	hundreds kΩ
⑥	④	∞
⑦	④	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

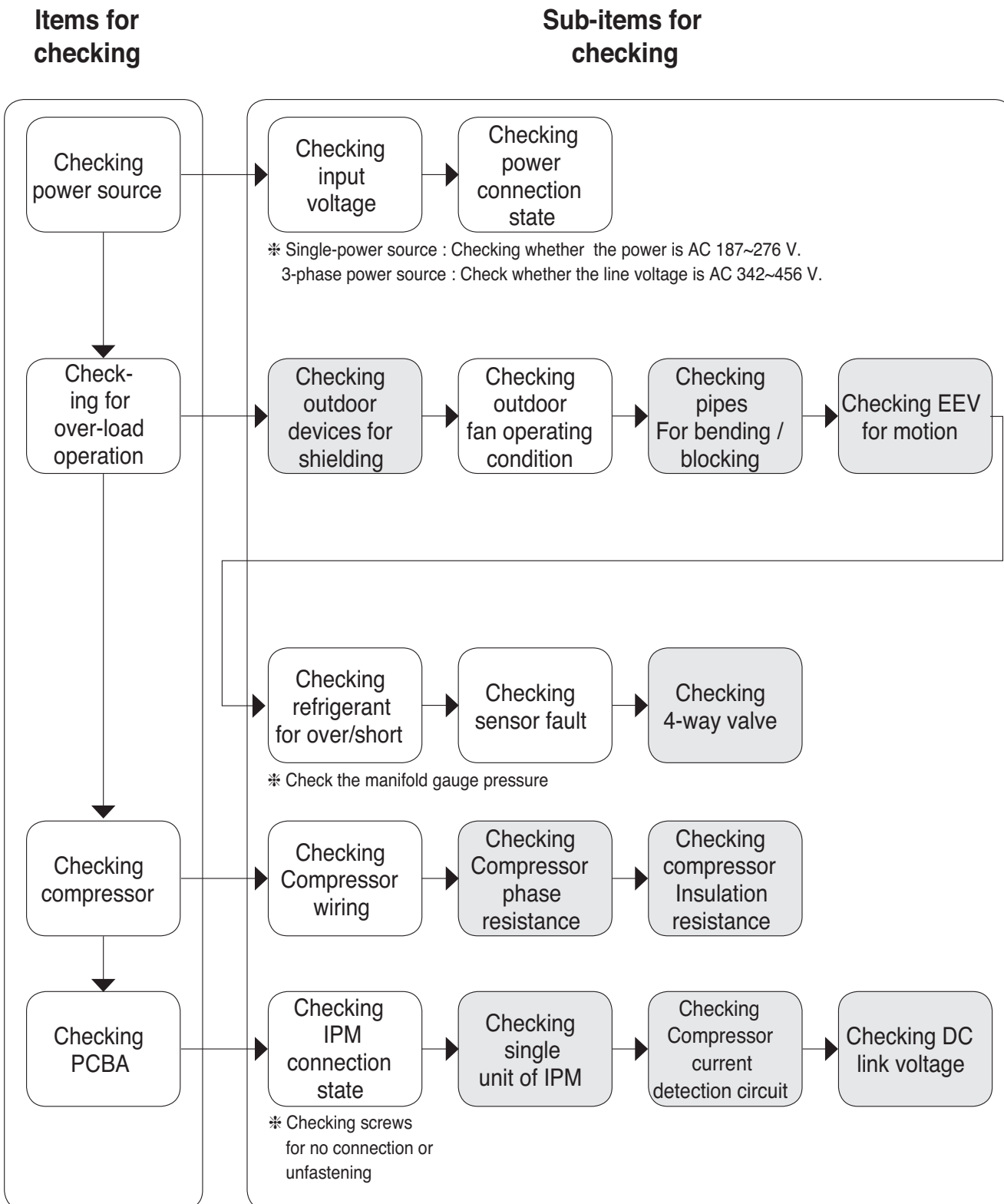
### CH 21 (DC Peak / Comp IPM Fault)

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



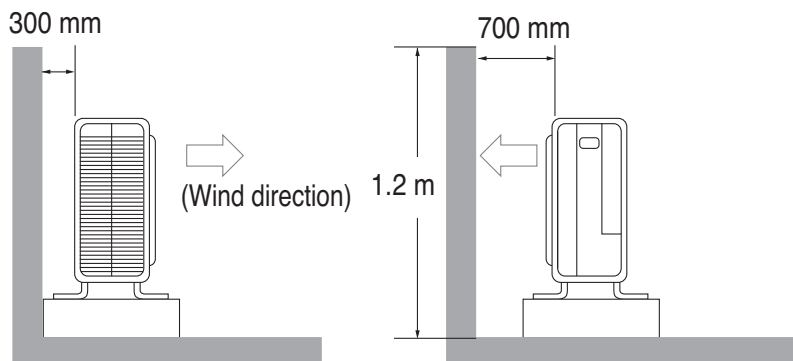
## 6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

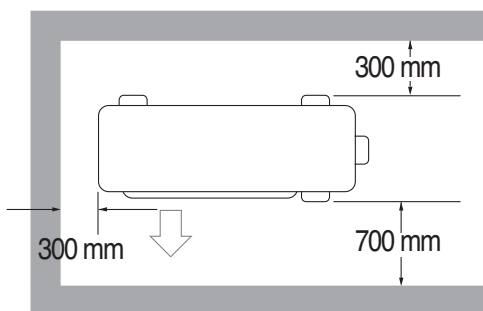
### Checking outdoor devices for shielding

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)



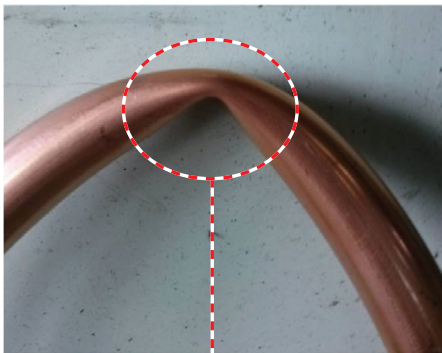
## 6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

### Generation of refrigerant flow disturbance

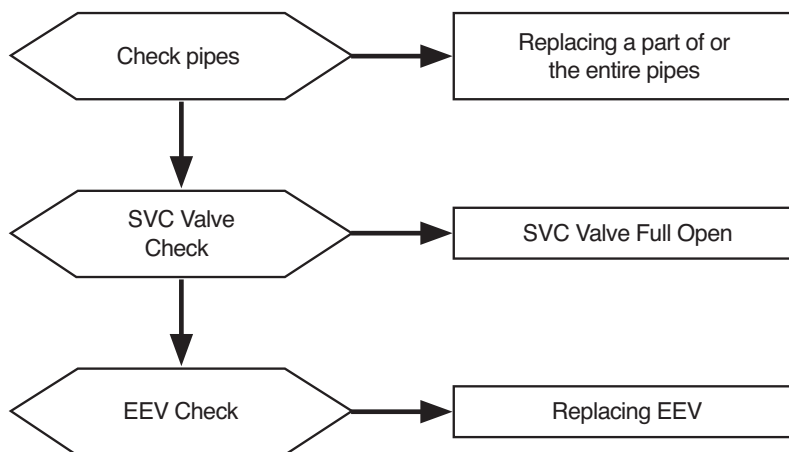
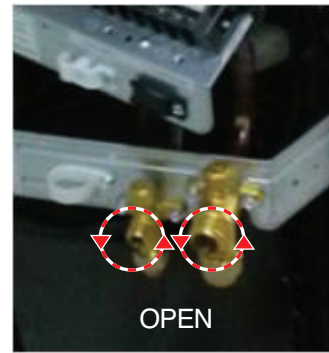
Cause of Trouble	Condition	Mechanism of Fault Generation
Generation of refrigerant flow disturbance	Bending/Blocking of a pipe EEV fault Closing of SVC Valve	Freezing of indoor device → Reduced evaporation temperature due to excessive expansion of refrigerant. Weak heating and cooling → Insufficient 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.



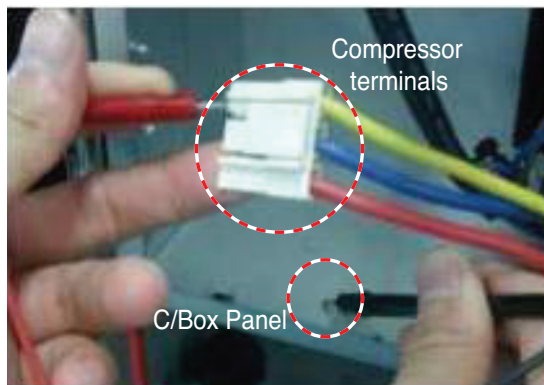
## 6.7 Troubleshooting Outdoor Error

### CH 21 (DC Peak / Comp IPM Fault)

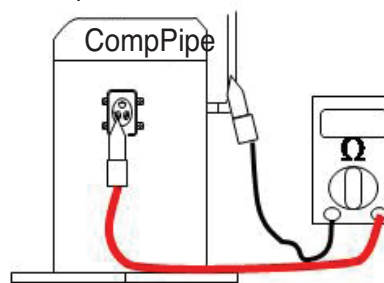
#### Checking compressor phase resistance

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.



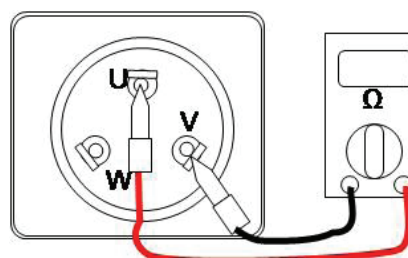
Terminal	Insulation Resistance
U-panel	$\geq 10 \text{ M}\Omega$
V-panel	$\geq 10 \text{ M}\Omega$
W-panel	$\geq 10 \text{ M}\Omega$

1. Turn the switch of the tester to "Resistance" mode and check the resistance
2. Measure the resistance between the terminals.
3. "0  $\Omega$ " 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.

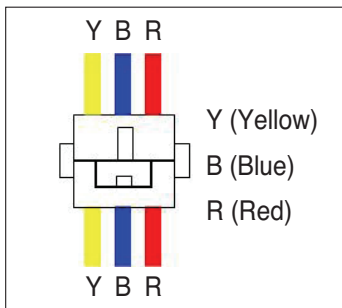


Model		DKT156MAD	DKT208MAB	RJB036MAB	DJT240MAA
Windings Resistance (at 25 °C)	U-V	1.330±7 % $\Omega$	1.125±7 % $\Omega$	0.529±7 % $\Omega$	0.628±7 % $\Omega$
	V-W	1.330±7 % $\Omega$	1.125±7 % $\Omega$	0.529±7 % $\Omega$	0.628±7 % $\Omega$
	W-U	1.330±7 % $\Omega$	1.125±7 % $\Omega$	0.529±7 % $\Omega$	0.628±7 % $\Omega$
Windings Resistance (at 75 °C)	U-V	1.620±7 % $\Omega$	1.345±7 % $\Omega$	0.631±7 % $\Omega$	0.758±7 % $\Omega$
	V-W	1.620±7 % $\Omega$	1.345±7 % $\Omega$	0.631±7 % $\Omega$	0.758±7 % $\Omega$
	W-U	1.620±7 % $\Omega$	1.345±7 % $\Omega$	0.631±7 % $\Omega$	0.758±7 % $\Omega$

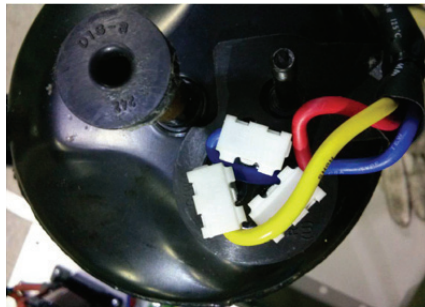


Purpose	Judgment of the fault of the compressor.	Items for checking
		1. Measurement of insulation resistance between the compressor and panel. 2. Measurement of phase resistance. 3. Wiring Check.

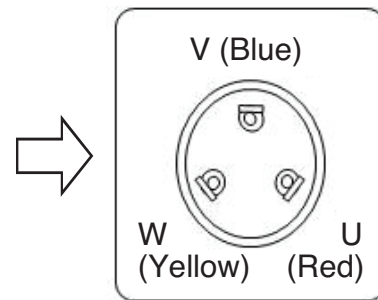
### ■ How to check the compressor wiring error



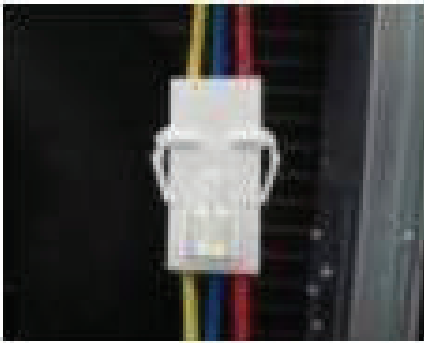
Check whether the PCB wires and compressor wires are connected in the same colors.



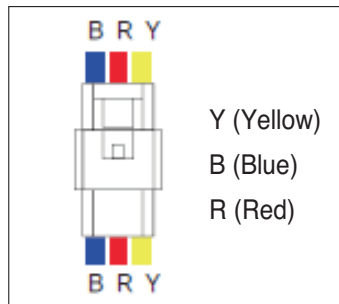
Check whether the compressor wires are properly connected with U, V, and W.



\* The wiring direction is CCW. (counter clock wise)



[Picture of normal compressor wiring]



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



[Picture of normal compressor wiring]

## 6.7 Troubleshooting Outdoor Error

### CH 21 (DC Peak / Comp IPM Fault)

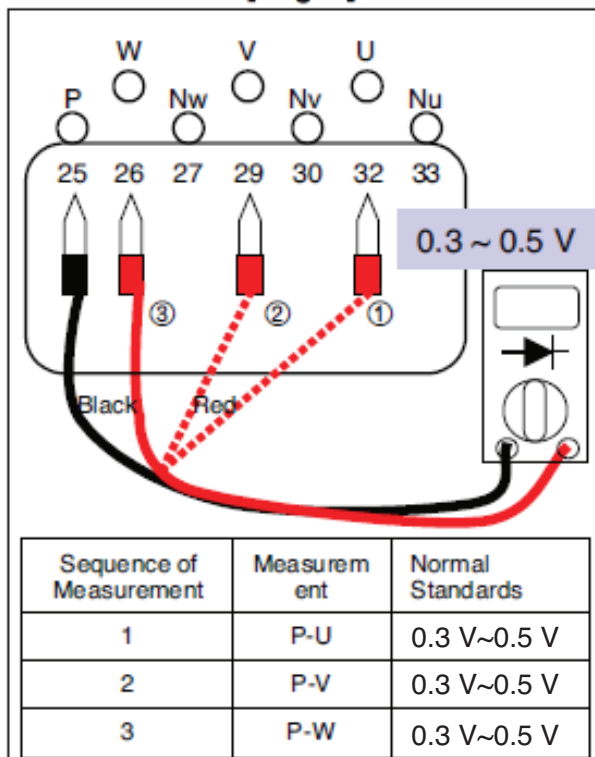
#### IPM Check

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

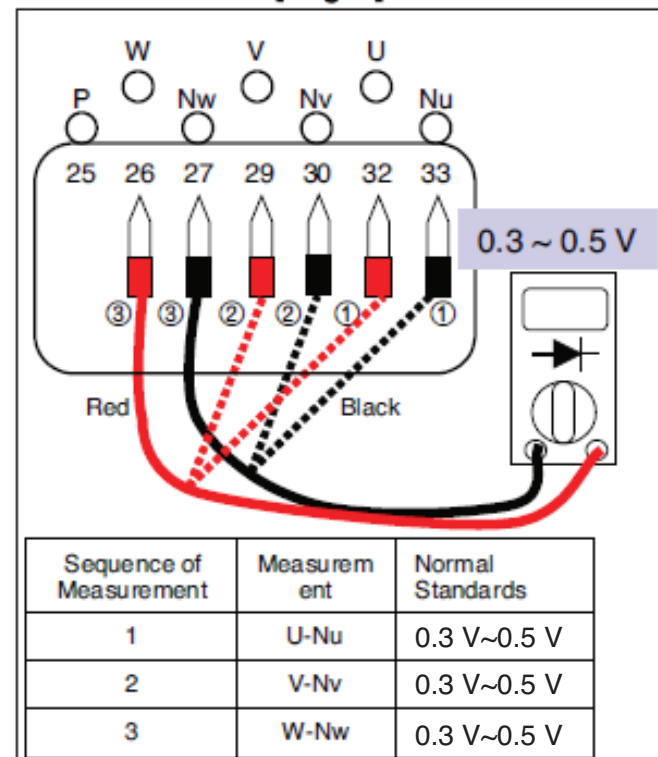
#### ■ How to check IPM IGBT (Diode Mode)

1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. (→|←)
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.

[ Fig.1 ]



[ Fig.2 ]

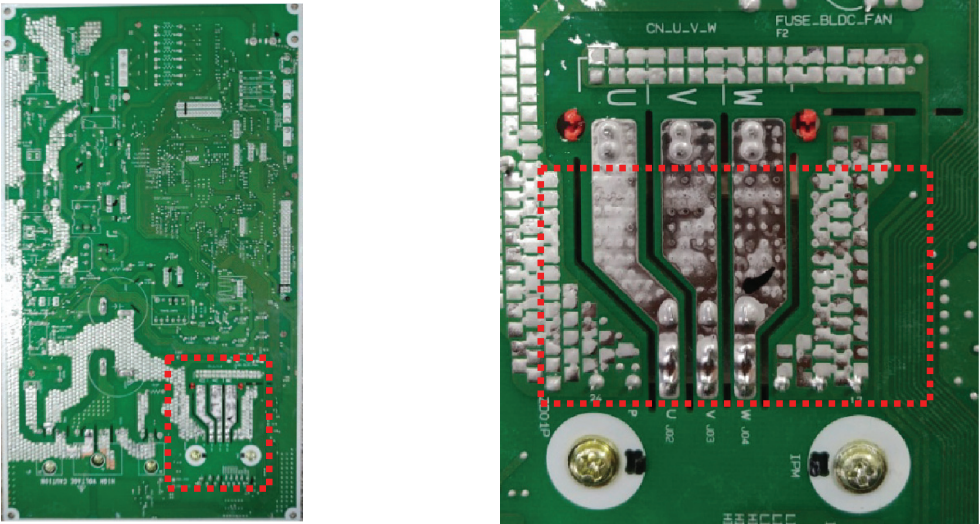
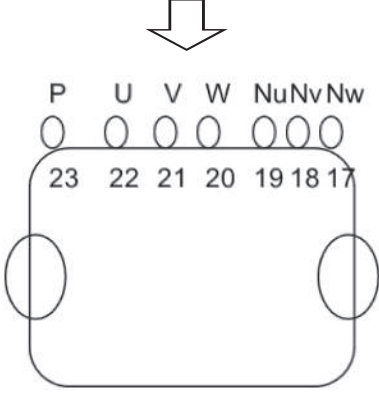


## 5. Trouble Shooting

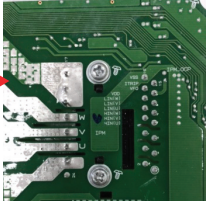
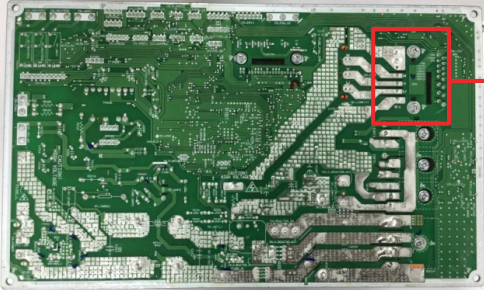

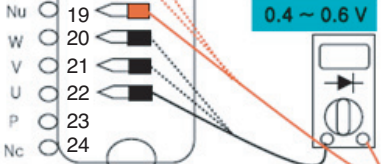
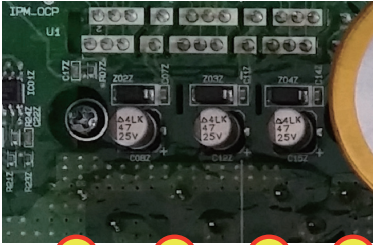
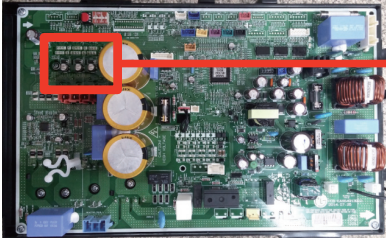
Purpose	Judgment of the IPM part fault of PCB assembly.	Items for checking	1. Judgment of damage of IGBT 2. Checking the soldering state
---------	---	--------------------	--

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 0.3~0.5V
5	Judge IPM Pins for short.

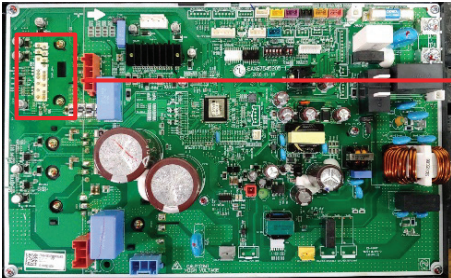
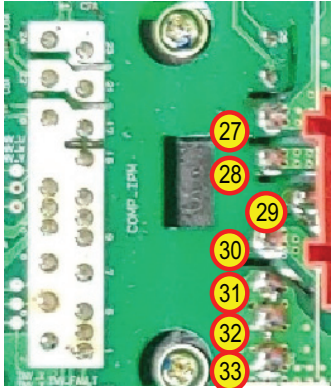
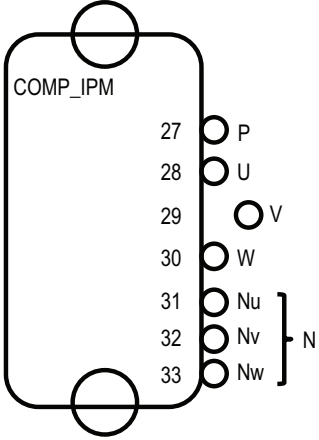
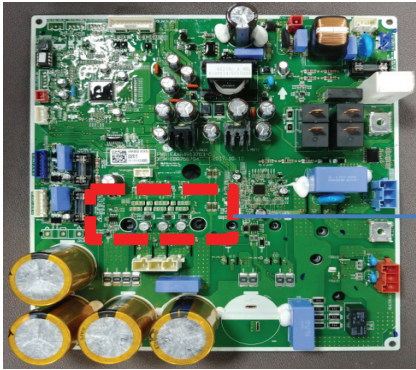
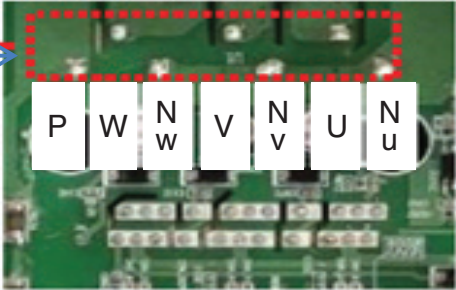
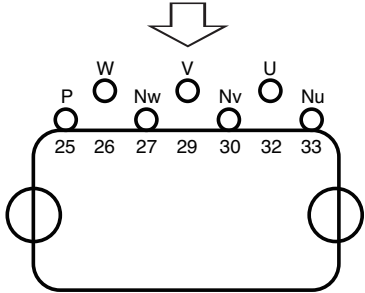
### ■ IPM Check Point

Division	IPM Check Point
2.5 kW	  <p>[IPM Pin Arrangement and Pin Numbers]</p>

■ IPM Check Point

Division	IPM Check Point
4 kW	<div></div> <div><div><div><div>Nw</div><div>Nv</div><div>Nu</div><div>W</div><div>V</div><div>U</div><div>P</div><div>Nc</div></div><div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div></div></div><div><div>0.4 ~ 0.6 V</div><div>故障 正常</div></div><div><div><div>Nw</div><div>Nv</div><div>Nu</div><div>W</div><div>V</div><div>U</div><div>P</div><div>Nc</div></div><div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div></div></div><div><div>0.4 ~ 0.6 V</div><div>故障 正常</div></div><div><div>[Figure 1]</div><div>[Figure 2]</div></div></div>
4 kW	<div></div> <div><div>33</div><div>32</div><div>30</div><div>29</div><div>27</div><div>26</div><div>25</div></div> <div><div>U1</div><div><div>33</div><div>32</div><div>30</div><div>29</div><div>27</div><div>26</div><div>25</div></div><div><div>Nu</div><div>U</div><div>Nv</div><div>V</div><div>Nw</div><div>W</div><div>P</div></div></div>

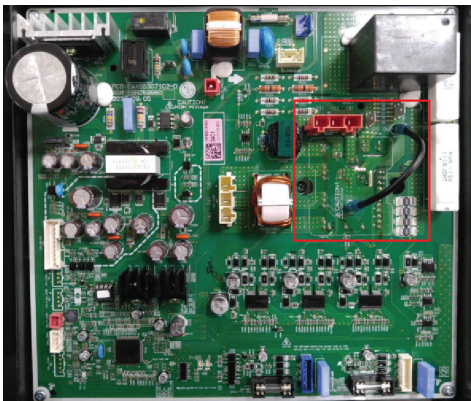
■ IPM Check Point


Division	IPM Check Point
4.5kW	<div></div> <div></div> <div></div>
6 kW	<div></div> <div></div> <div></div> <div>[IPM Pin Arrangement and Pin Numbers]</div>

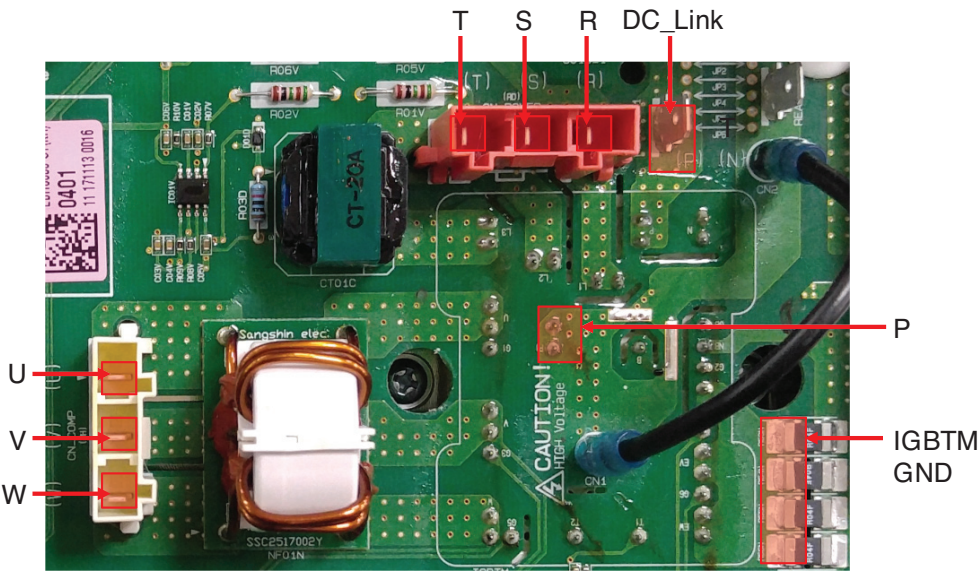


■ IPM Check Point

7 kW (U3)



Check Point	Multi Meter			Measured value	
	Mode	BLACK	RED	Normal	Abnormal
IGBTM High side Didoe		DC_Link	R	0.35 V ~ 0.7 V	Non-normal
			S		
			T		
R		IGBTM GND			
S					
T					
IGBTM Low side Didoe		P	U		
			V		
			W		
IGBTM Hige side IGBT		U	IGBTM GND		
	V				
	W				
IGBTM Low side IGBT					



## 6.7 Troubleshooting Outdoor Error

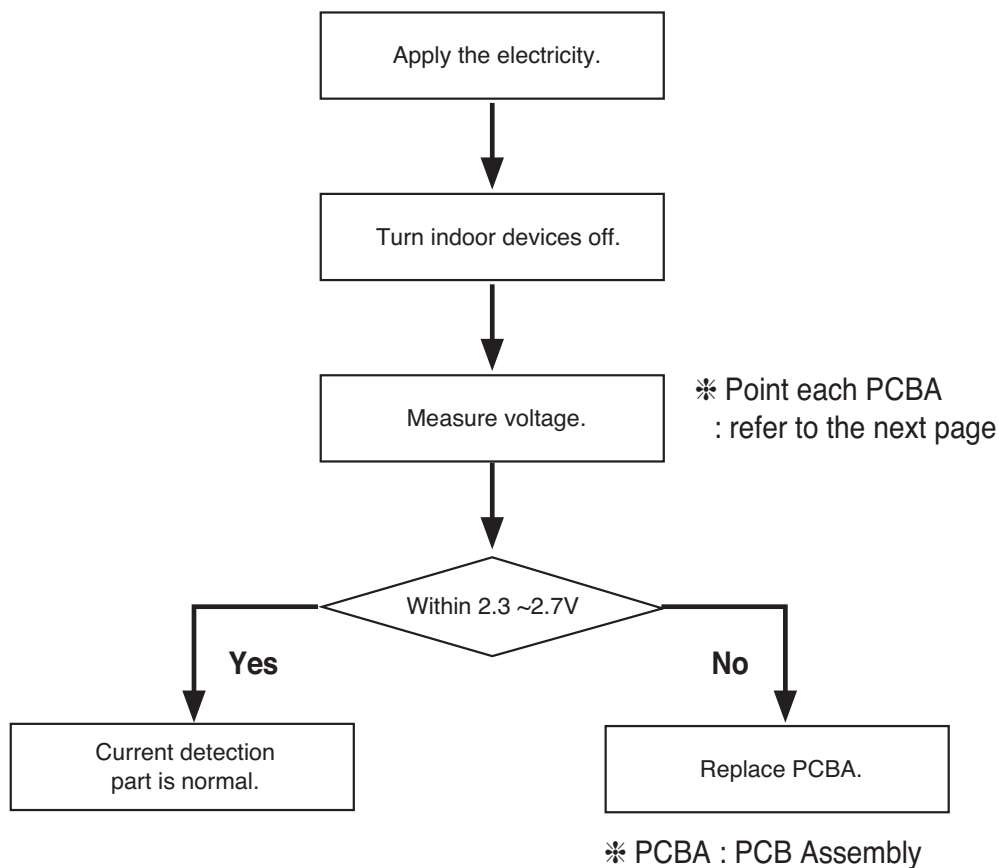
CH 21 (DC Peak / Comp IPM Fault)

### Compressor Phase Current Detection Circuit

<b>Purpose</b>	Judgment of the IPM part fault of PCB assembly.	<b>Items for checking</b>	1. Checking for current detection error.
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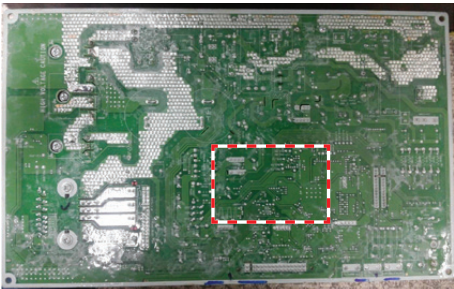
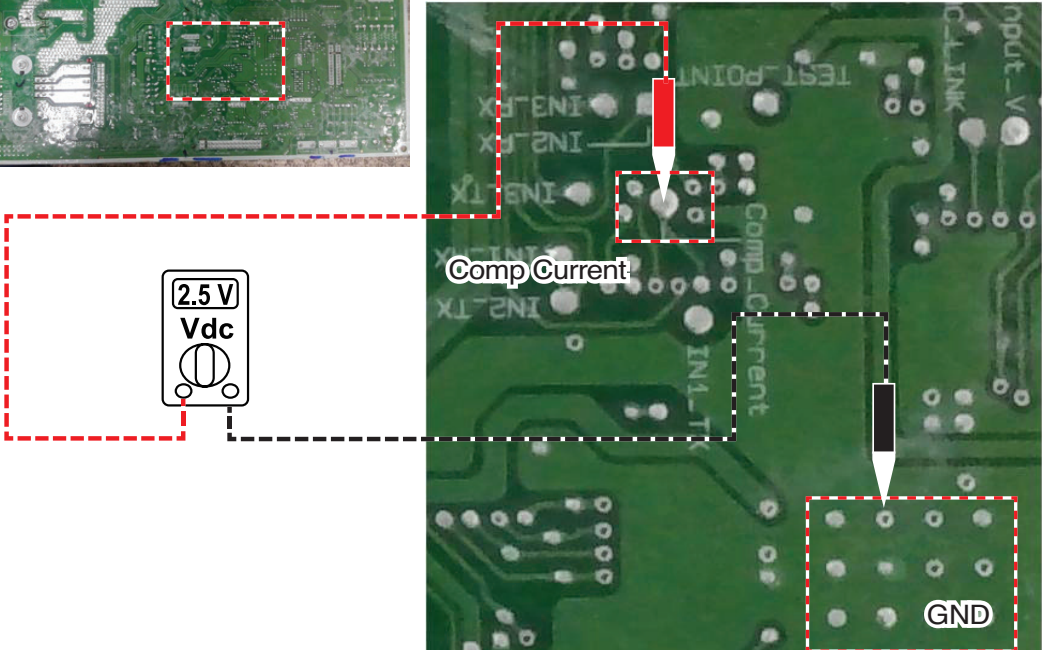
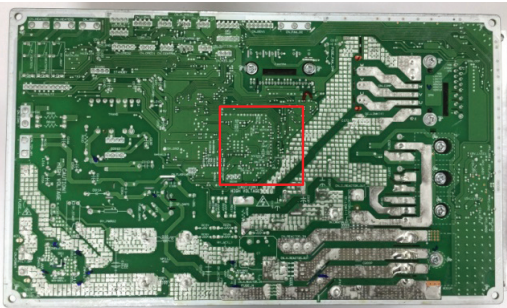
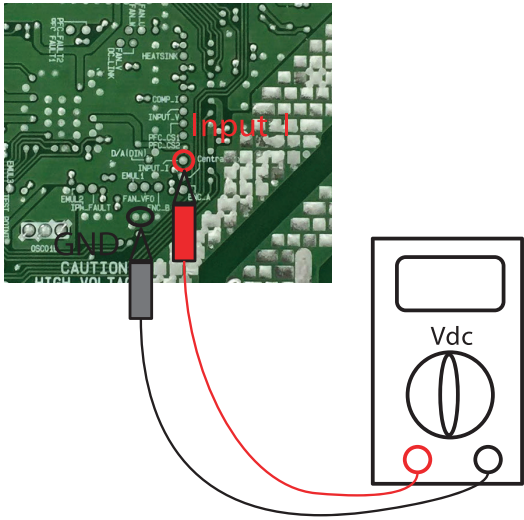
1. Set the tester in DC Voltage Mode and check the Voltage.
2. Measure the voltage of phase current detection signal – Micom GND.
3. The standard of normal voltage measurement is  $2.5\text{ V} \pm 0.2\text{ V}$ .
4. If the measurement is different from the standard, replace PCBA.

#### Checking method



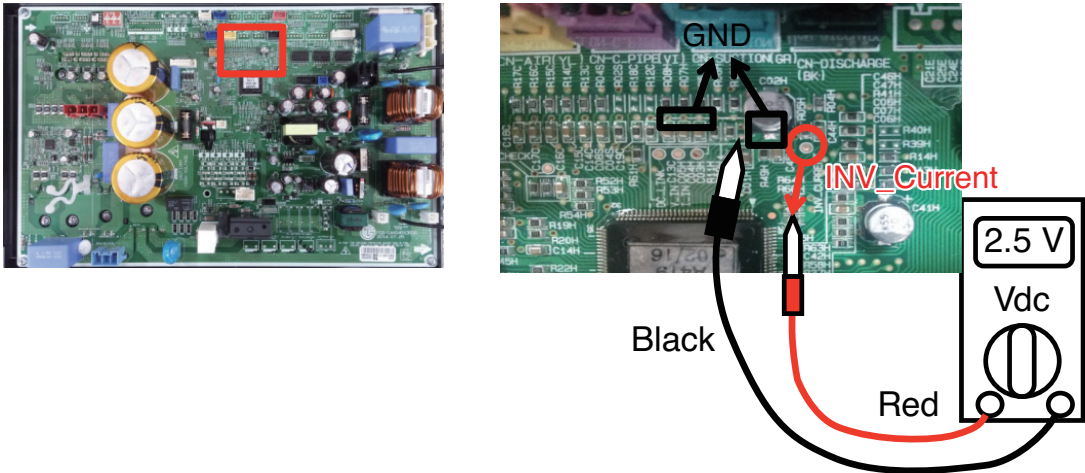
**! Caution :** When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

■ Current Detection Circuit Check Point

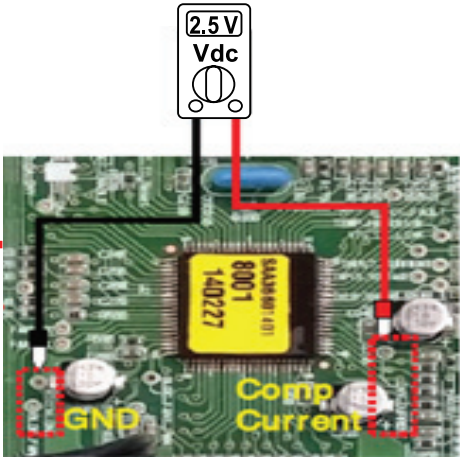
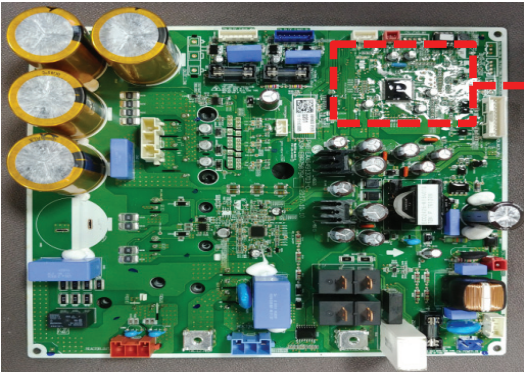
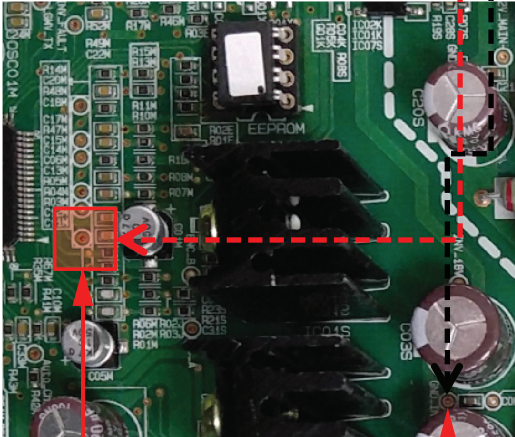
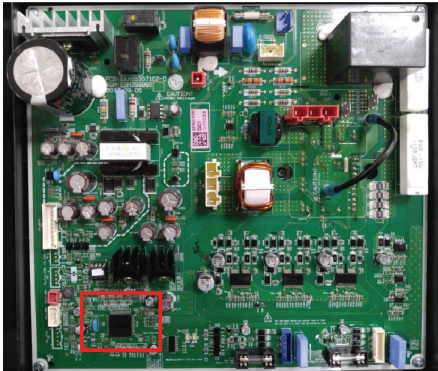
Division	Compressor Phase Current Detection
2.5 kW	<div></div> <div></div>
4 kW	<div></div> <div></div>



## ■ Current Detection Circuit Check Point

Division	Compressor Phase Current Detection
4 kW	 <p>The image shows two photographs of a 4 kW compressor control board. The left photograph shows the entire board with a red box highlighting the current detection circuit. The right photograph is a close-up of the circuit, showing a multimeter connected to measure the current. The black probe is connected to a GND point, and the red probe is connected to a point labeled 'INV_Current'.</p>

■ Current Detection Circuit Check Point

Division	Compressor Phase Current Detection
6 kW	<div></div>
7 kW	<div><div>Inverter Current</div><div>GND_INV</div></div>

## 6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

### 4-Way Valve Check

Purpose	Judge whether the 4-way valve part has any fault.	Items for checking	1. Check the working voltage of the 4-way valve. 2. Check the 4-way valve coil resistance.
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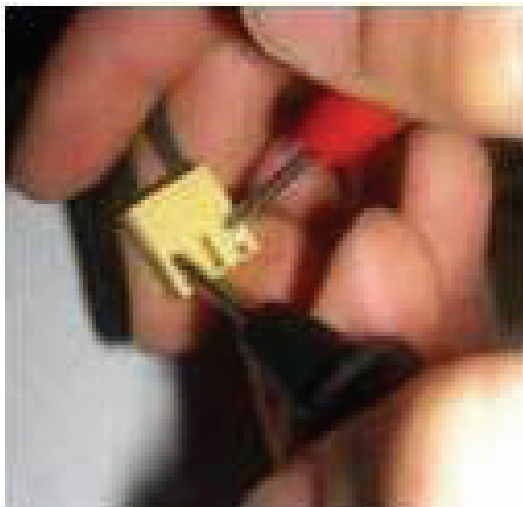
#### ■ Checking the output voltage of CN-4way (refer to next page)

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

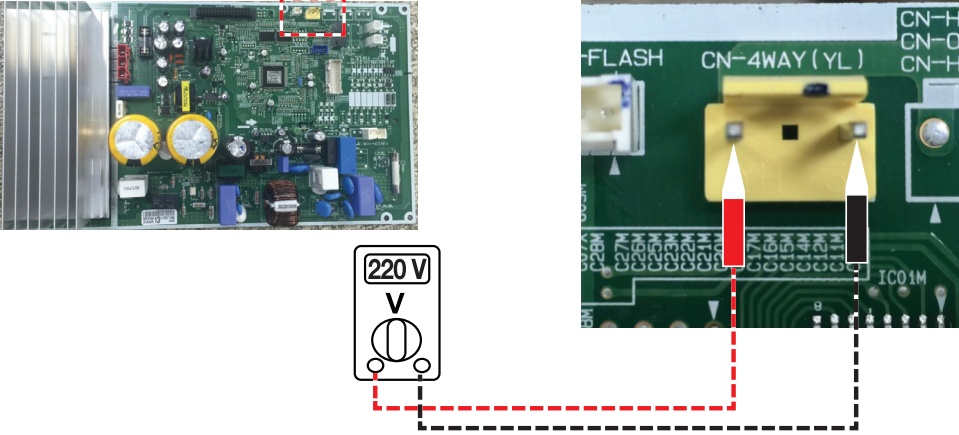
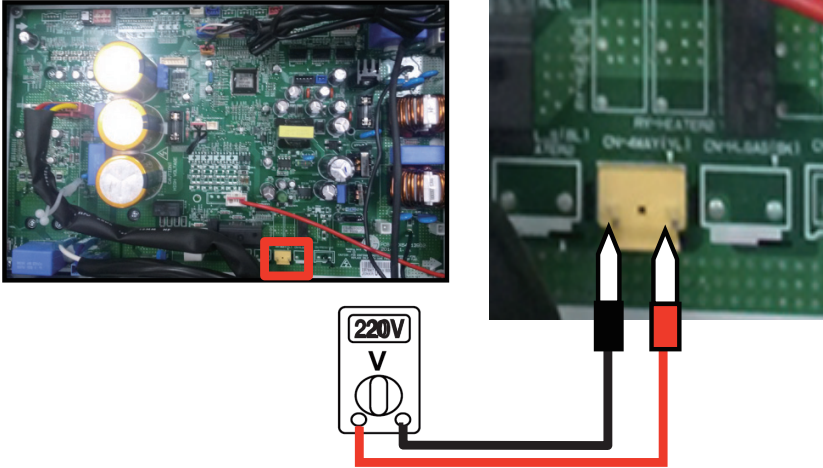
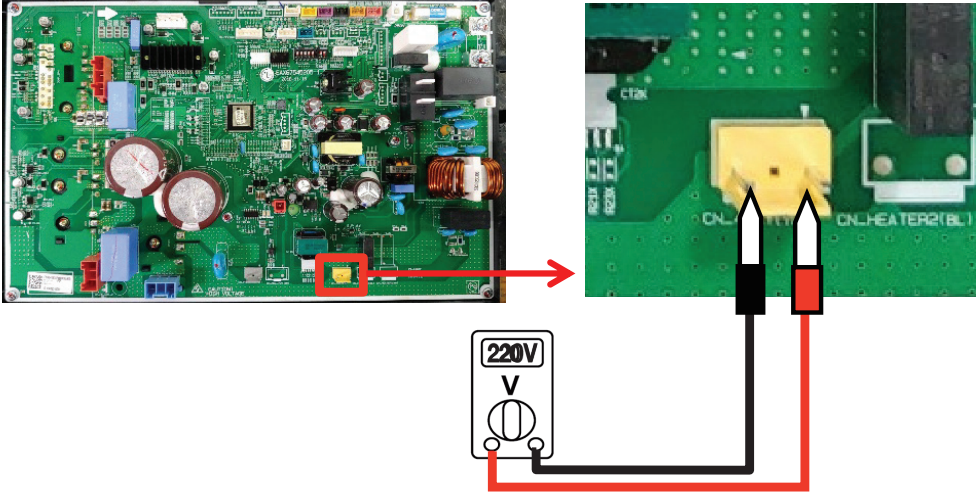
#### ■ Check the 4-way.valve coil resistance.

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 14 k $\Omega$   $\pm 10$  %.
4. If the measurement is different from the standard, replace 4-Way valve coil.



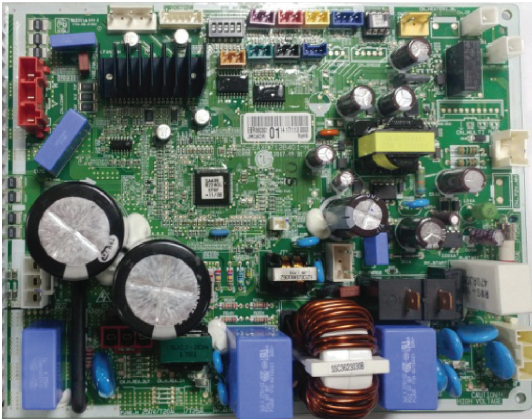

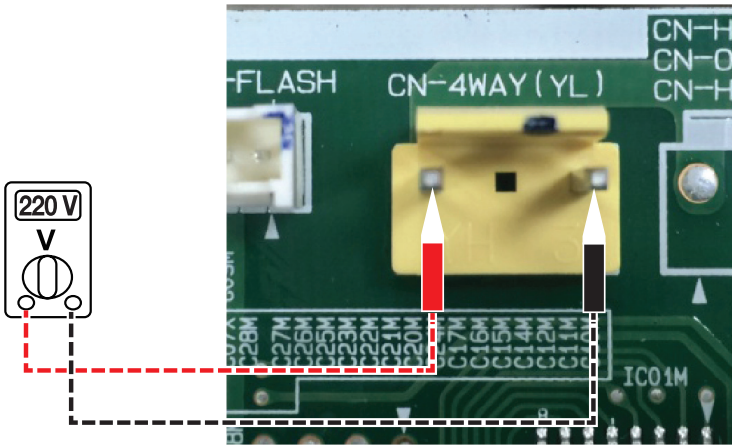
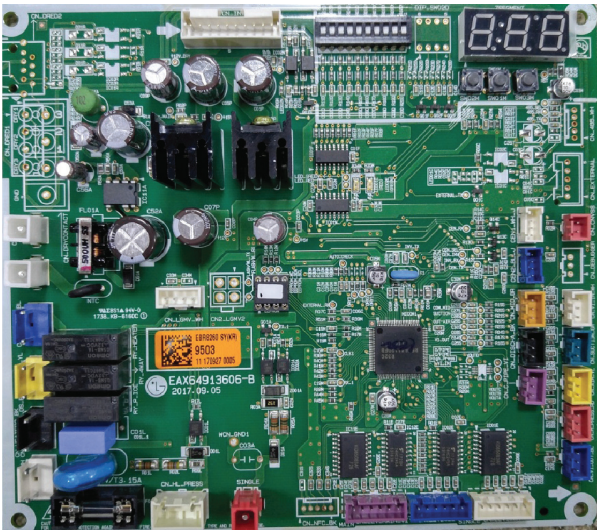
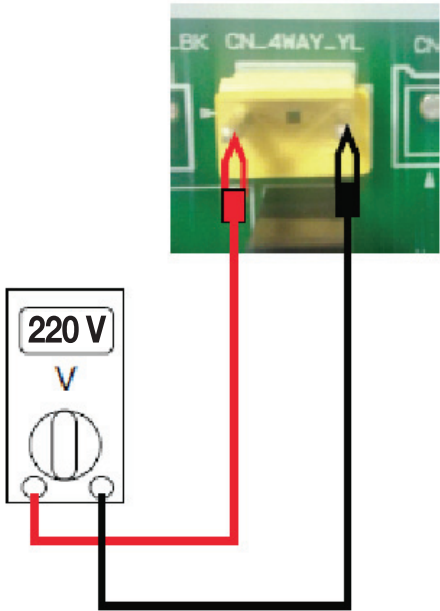
**! Caution :** When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

■ 4-Way Check Point

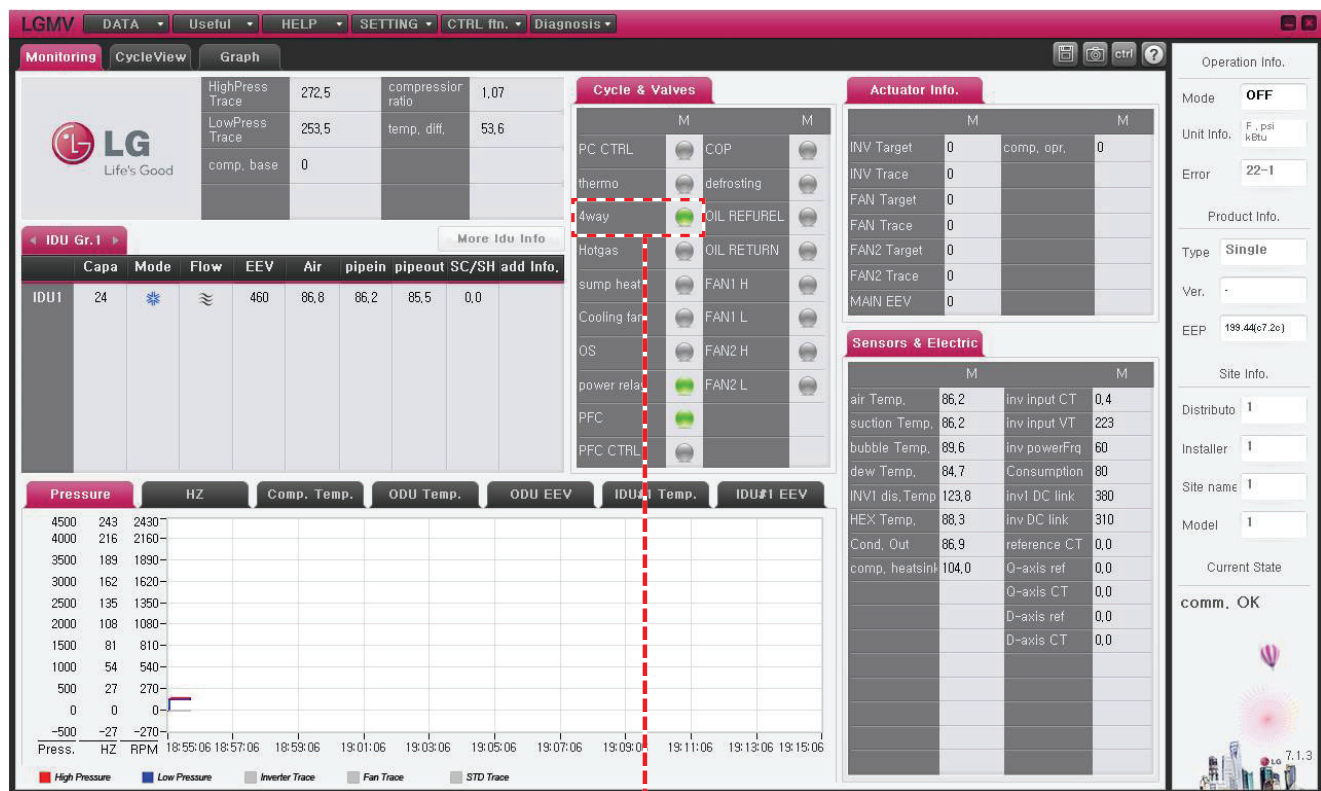
Division	4Way Check
2.5 kW	 <p>The diagram for the 2.5 kW unit shows a main PCB view with a red dashed box highlighting a component. A 220V AC source is connected to the terminals of the component. A close-up view shows the component is a yellow 4-way connector labeled 'CN-4WAY (YL)'. The red dashed line indicates the connection path from the 220V source to the terminals.</p>
4 kW	 <p>The diagram for the 4 kW unit shows a main PCB view with a red box highlighting a component. A 220V AC source is connected to the terminals of the component. A close-up view shows the component is a yellow 4-way connector labeled 'CN-4WAY (YL)'. The red line indicates the connection path from the 220V source to the terminals.</p>
4.5kW	 <p>The diagram for the 4.5 kW unit shows a main PCB view with a red box highlighting a component. A 220V AC source is connected to the terminals of the component. A close-up view shows the component is a yellow 4-way connector labeled 'CN-4WAY (YL)'. The red line indicates the connection path from the 220V source to the terminals.</p>



■ 4-Way Check Point

Division	4Way Check
4 kW	  
6/7 kW	 

## LGMV Display



4way



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

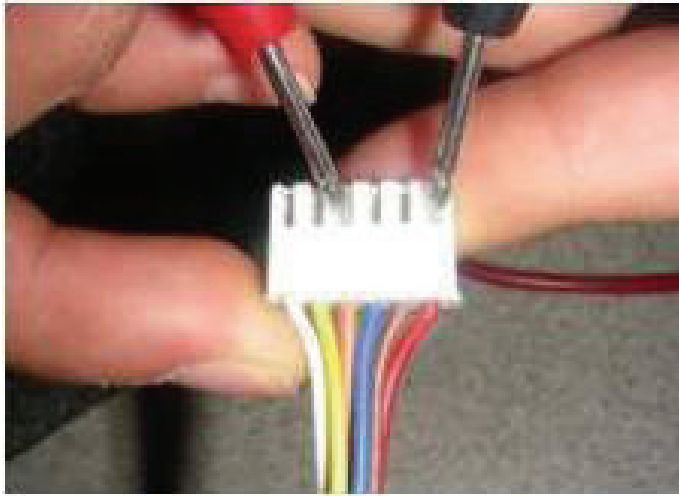
## 6.7 Troubleshooting Outdoor Error

CH 21 (DC Peak / Comp IPM Fault)

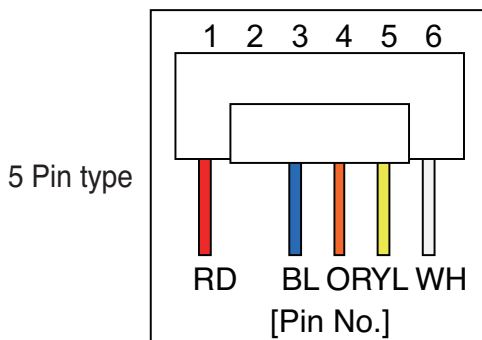
### EEV Check

<b>Purpose</b>	Judging EEV part fault.	<b>Items for checking</b>	1. Measure EEV resistance.
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#### ■ Checking EEV resistance

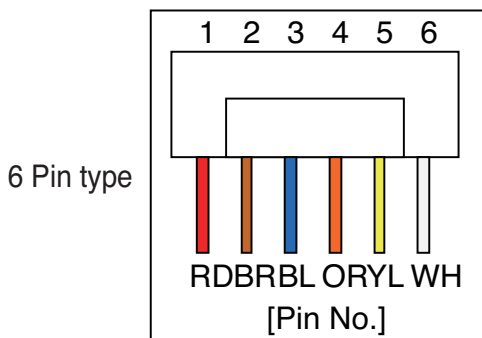


1. Set the tester in Resistance Mode and check the current.
2. Measure the resistance between eth Pins of EEV Connector.
3. For the measurement method and normal standard, refer to the Table.



[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

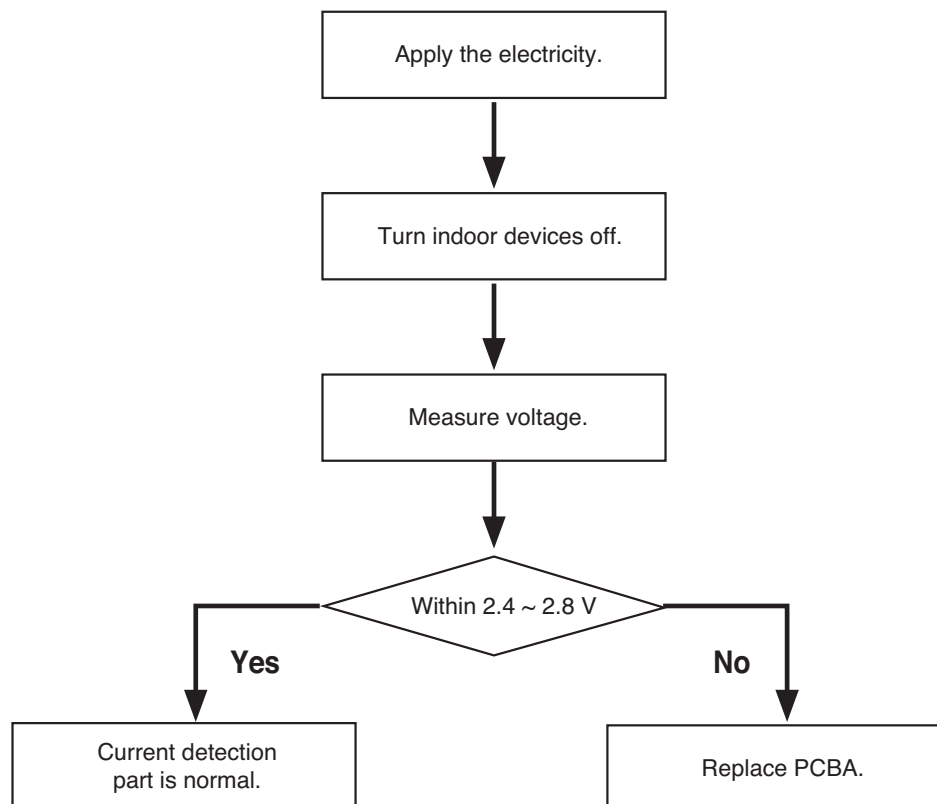
### CH 21 (DC Peak / Comp IPM Fault)

#### DC Link Detection Circuit

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

1. Set the tester in DC Voltage Mode and check the voltage.
2. Checking the voltage between DC Link detection signal and Micom GND.
3. The standard of normal voltage measurement is 2.4~2.8 V.
4. If the measurement is different from the standard, replace PCBA.

#### Checking method

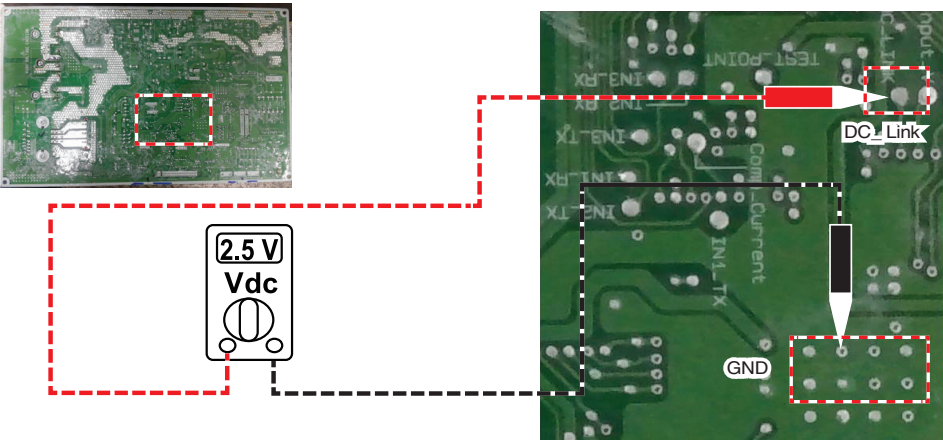
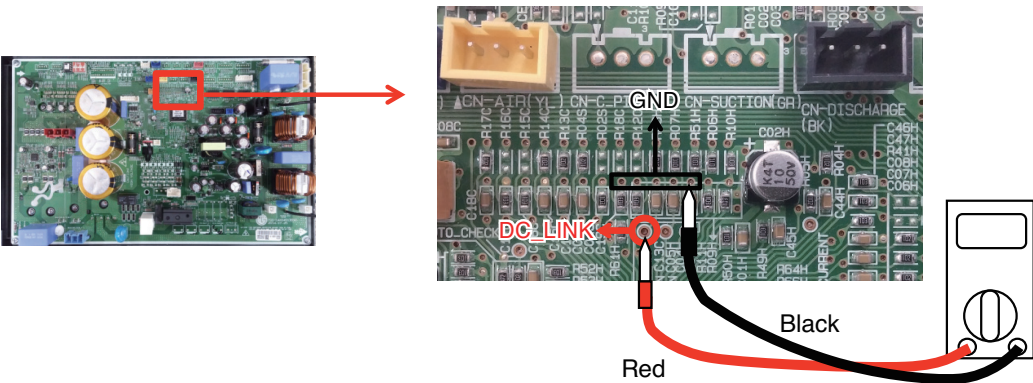
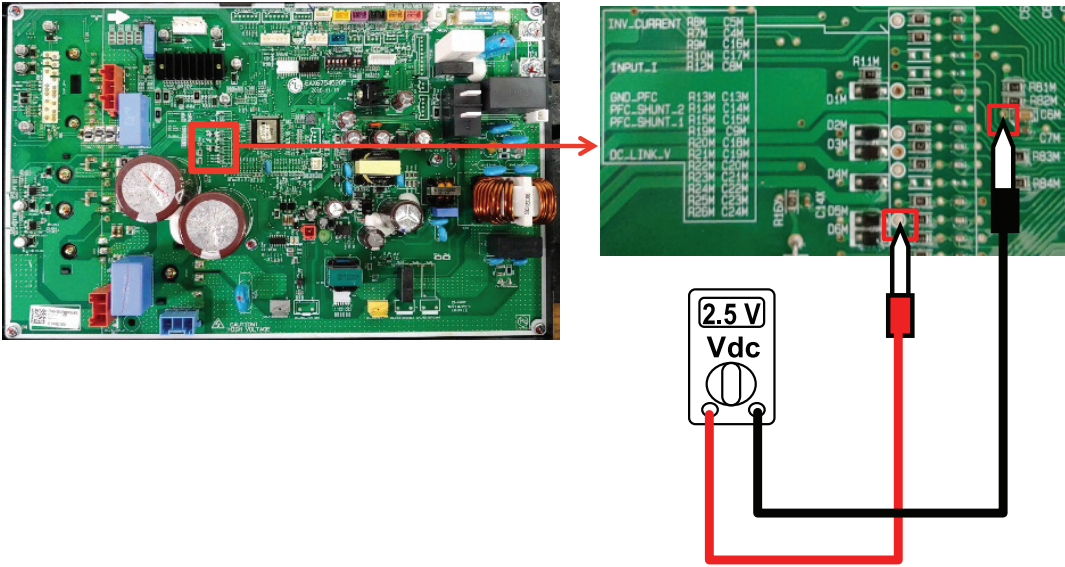


\* PCBA : PCB Assembly

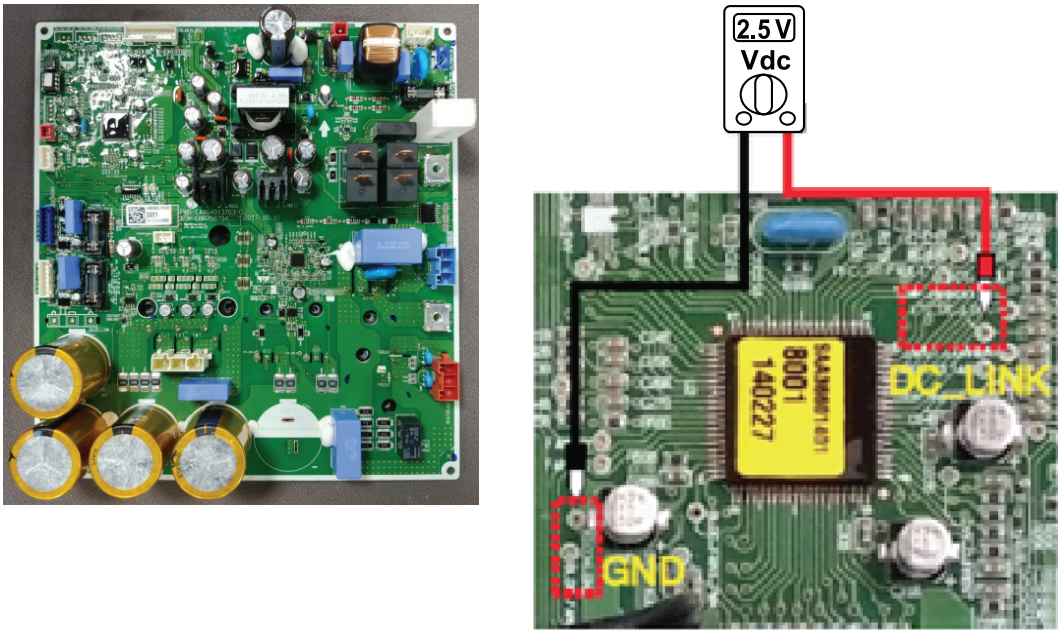
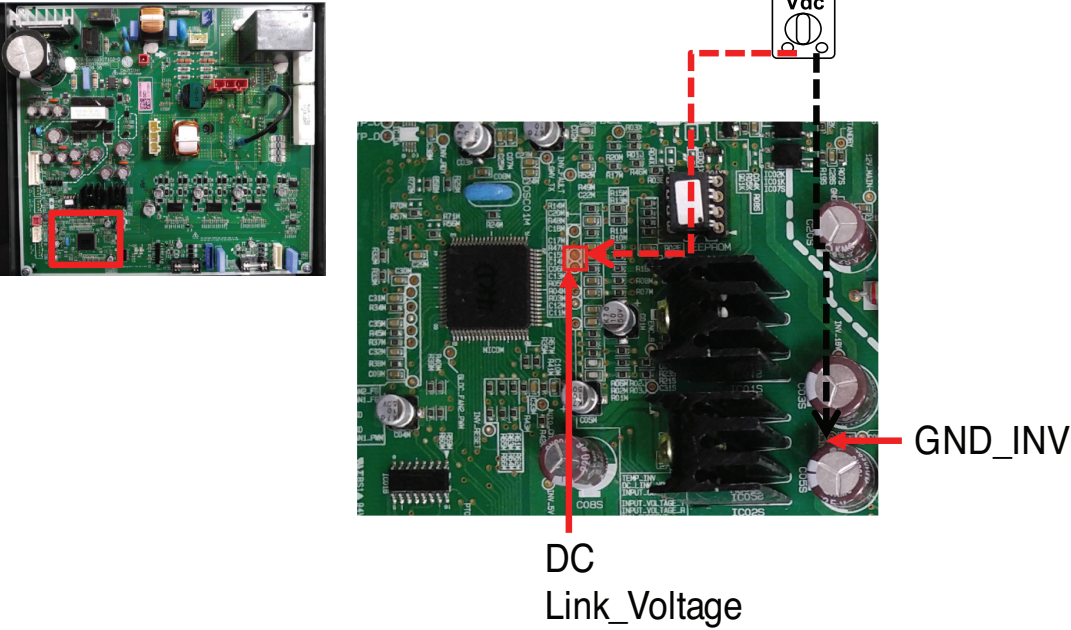
**! Caution :** When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.



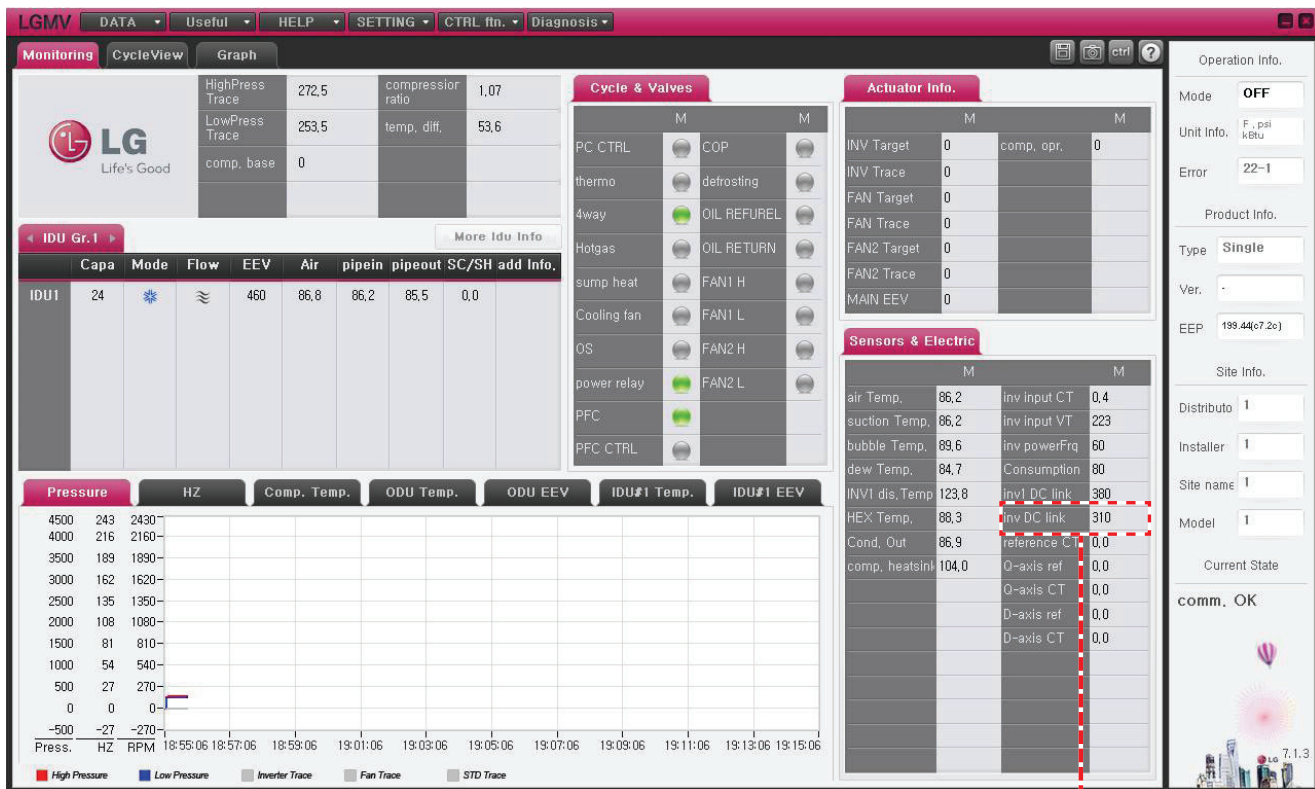
■ DC Link Detection Circuit Check Point

Division	DC Link Detection Circuit Check Point
2.5 kW	
4 kW	<p>1. Check DC Link Sensing Signal measurements at Power-on standby state. (DC 2.4 ~ 2.8 V)</p> 
4.5kW	

■ DC Link Detection Circuit Check Point

Division	DC Link Detection Circuit Check Point
6 kW	<div><p>The image shows the DC link detection circuit for a 6 kW unit. On the left is a full view of the green PCB with several large electrolytic capacitors at the bottom. On the right is a close-up of the detection circuit. A 2.5V Vdc source is connected to a red wire that goes to a pin on a yellow 8001 140227 IC. A black wire connects the source to a pin labeled 'GND' in a red dashed box. Another red wire connects the source to a pin labeled 'DC_LINK' in a red dashed box.</p></div>
7 kW	<div><p>The image shows the DC link detection circuit for a 7 kW unit. On the left is a full view of the green PCB with a red box highlighting the detection circuit area. On the right is a close-up of this circuit. A 2.5V Vdc source is connected to a red wire that goes to a pin labeled 'H' in a red dashed box. A black wire connects the source to a pin labeled 'GND_INV' in a red dashed box. A red arrow points to a pin labeled 'DC Link_Voltage' in a red dashed box.</p></div>

## 5. Trouble Shooting



inv DC link 310

DC Link NG Voltage level

Controller	Voltage
2~4 kW	140 V

DC Link NG Voltage level

Controller	Voltage
6 kW	140 V
7 kW	380 V

## 6.7 Troubleshooting Outdoor Error

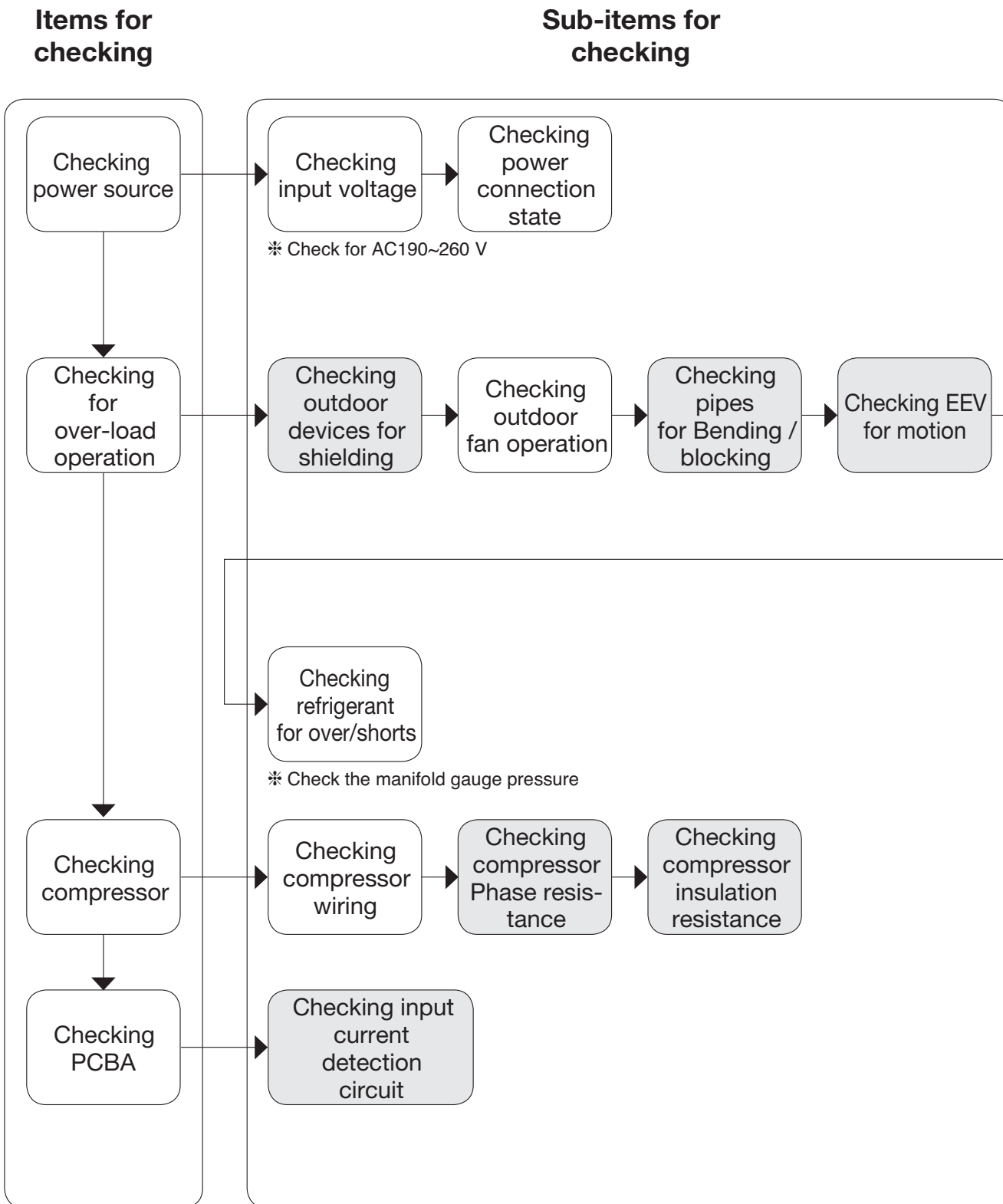
### CH 22 (Input of Over Current)

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 Panel, 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

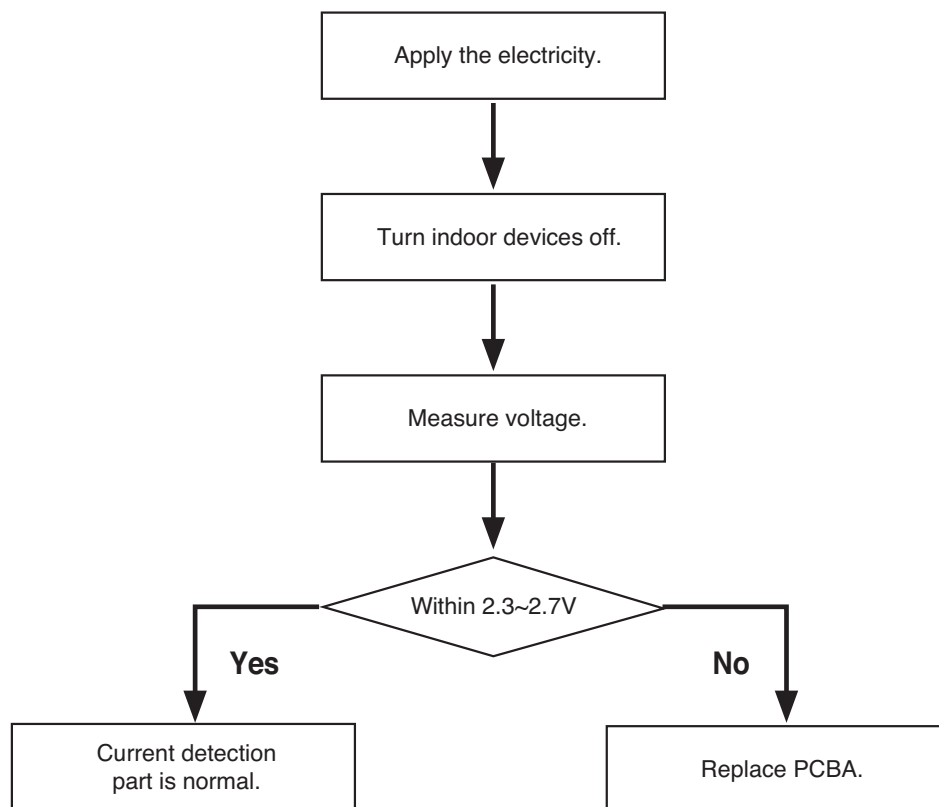
### CH 22 (Input of Over Current)

#### Input Current Detection Circuit

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

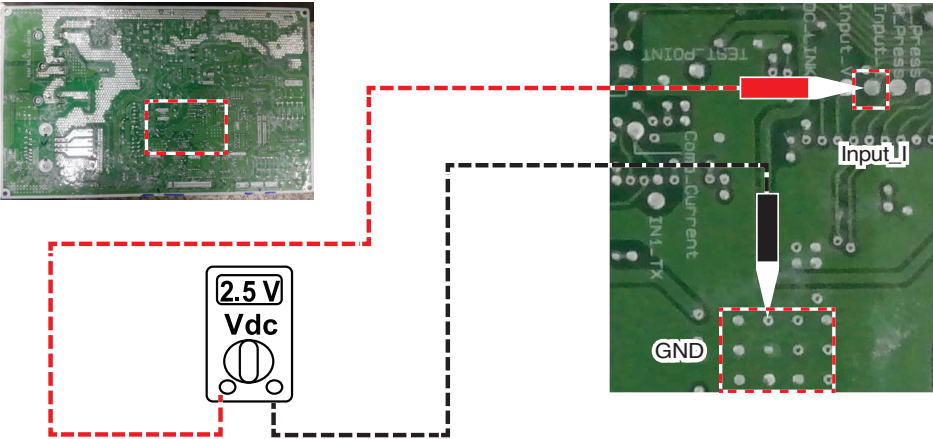
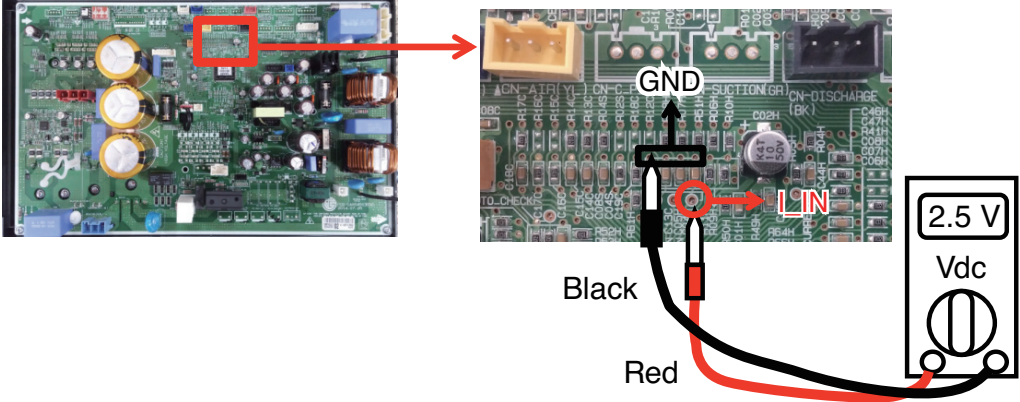
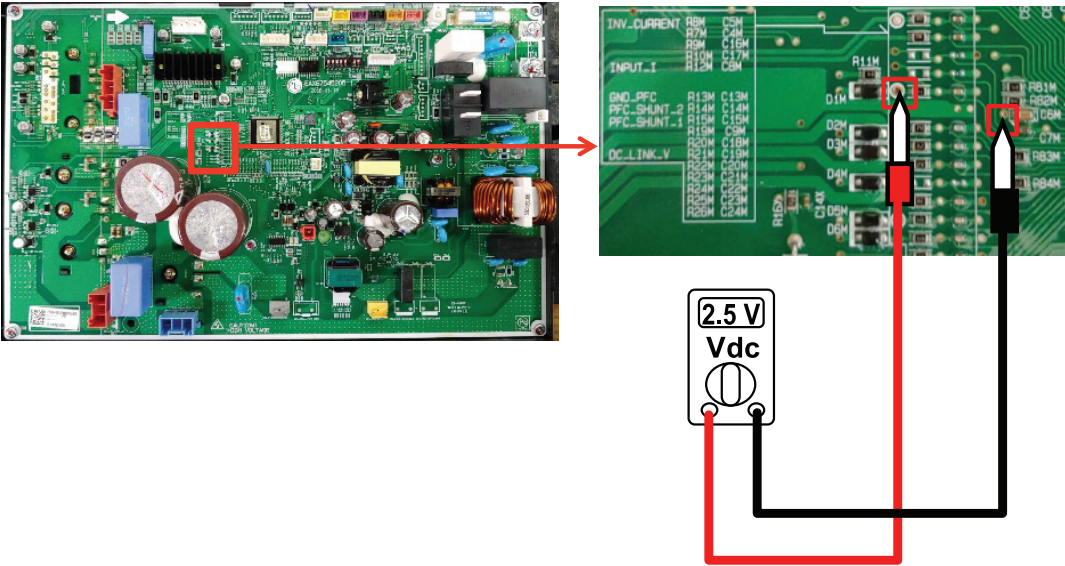
1. Set the tester in DC Voltage Mode and check the voltage.
2. Check the voltage between Input current detection signal and Micom GND.
3. The standard of normal voltage measurement is  $2.5\text{ V} \pm 0.2\text{ V}$ .
4. If the measurement is different from the standard, replace PCBA.


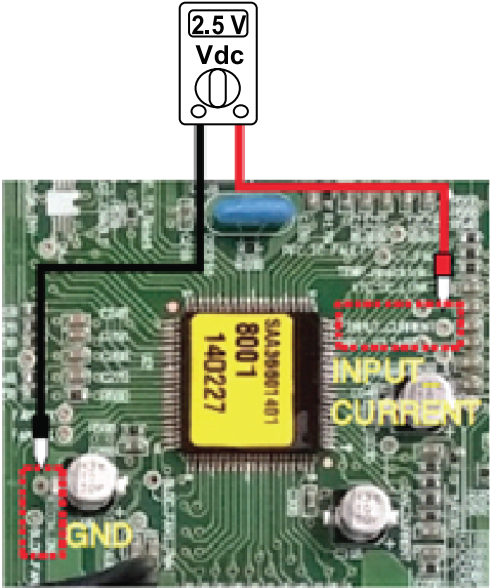
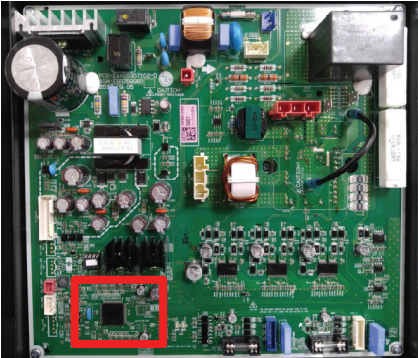
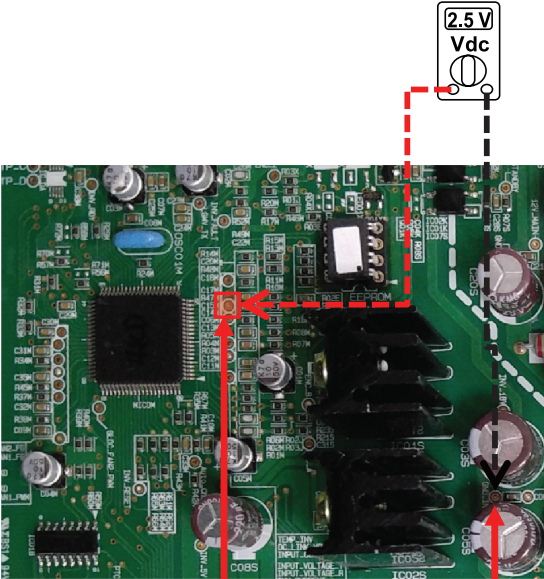
#### Checking method



\* PCBA : PCB Assembly

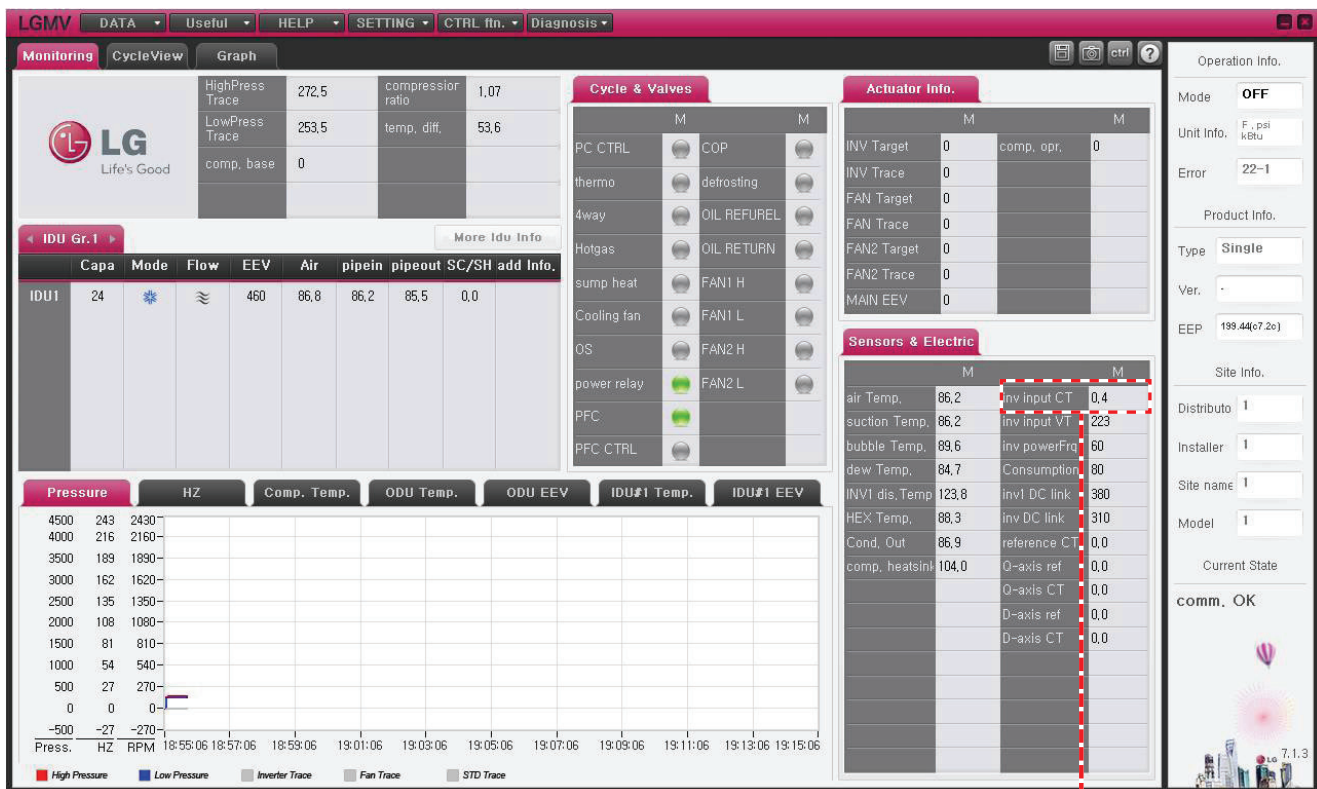
**! Caution :** When the measurement is made in the state that the electricity is applied, check the tester for being in the measurement mode and be careful to avoid possible short of the parts other than the measuring part.

Division	Input Current Detection Point
2.5 kW	
4 kW	
4.5 kW	

Division	Compressor Phase Current Detection
6 kW	<div data-bbox="345 255 792 736"></div> <div data-bbox="872 261 1360 851"></div>
7 kW	<div data-bbox="349 1053 766 1412"></div> <div data-bbox="828 932 1370 1513"></div> <div data-bbox="933 1549 1406 1591"><p>Input Current      GND_INV</p></div>



### LGMV Display



inv input CT 0.4

#### DC Link NG Voltage level

Controller	Current Level
2.5 kW	14 A
4 kW	19 A
6 kW	29 A
7 kW	Cooling 12 A Heating 13 A

## 6.7 Troubleshooting Outdoor Error

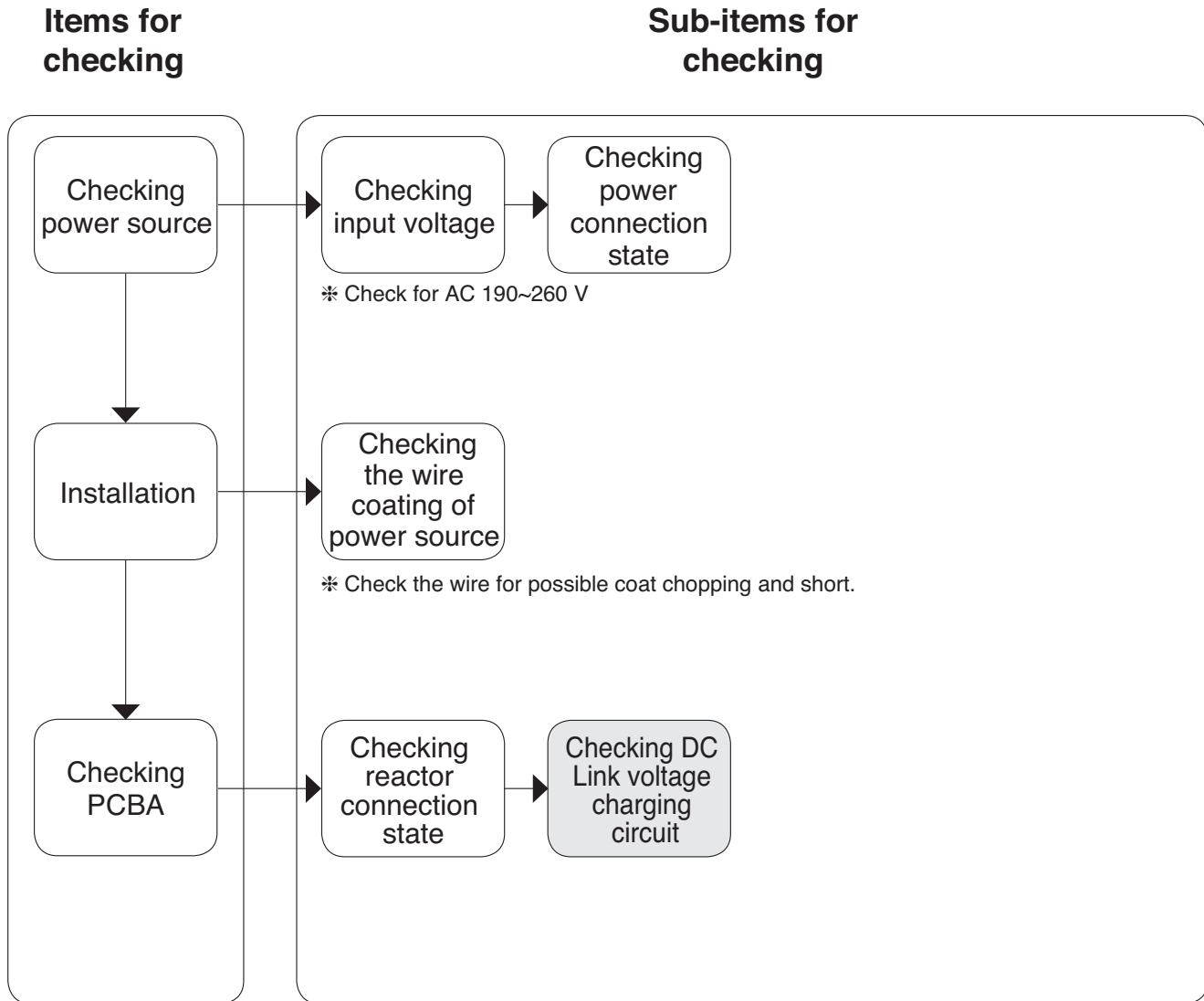
### CH 23 (DC Link Voltage Low)

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)


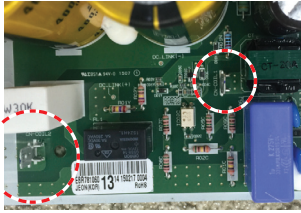
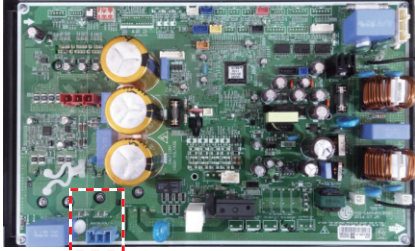
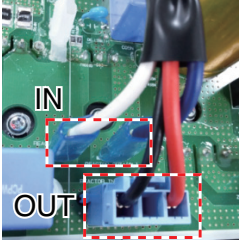
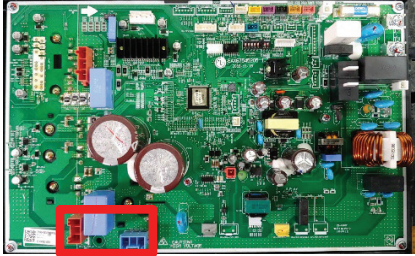
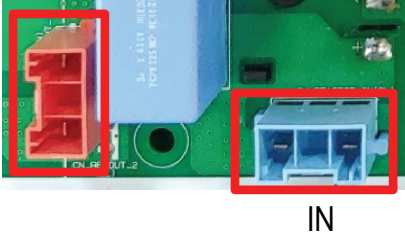
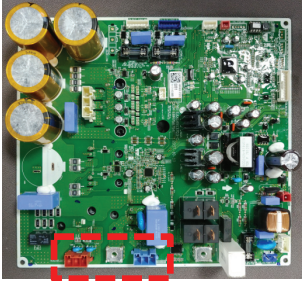
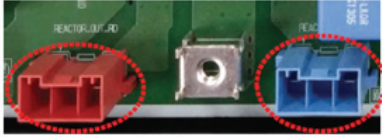
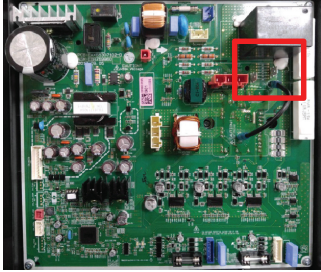
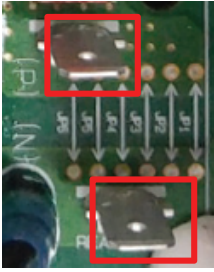
### Flow of trouble diagnosis



## 6.7 Troubleshooting Outdoor Error

## CH 23 (DC Link Voltage Low)

## Checking Reactor Connection

Division	Reactor Connector Point	
2.5 kW	 	
4 kW		
4.5 kW		
6 kW		
7 kW		

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6.7 Troubleshooting Outdoor Error

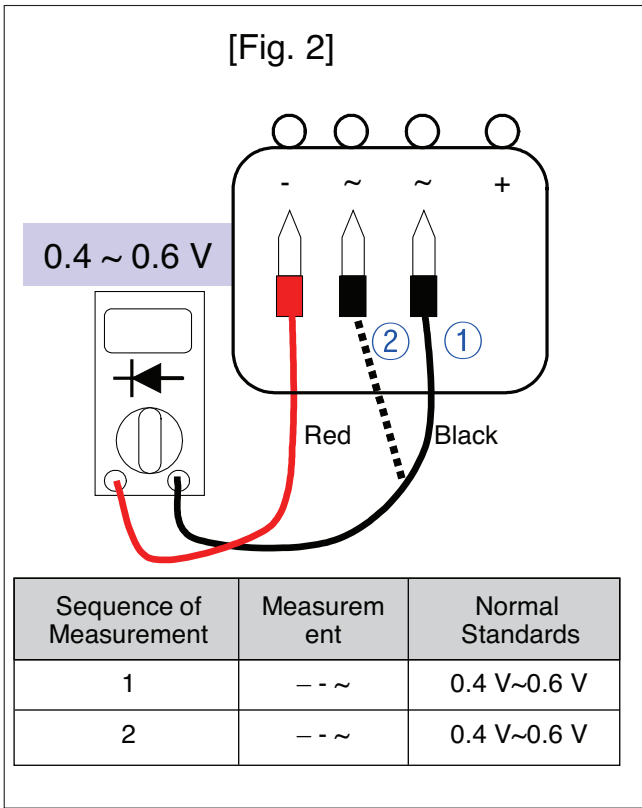
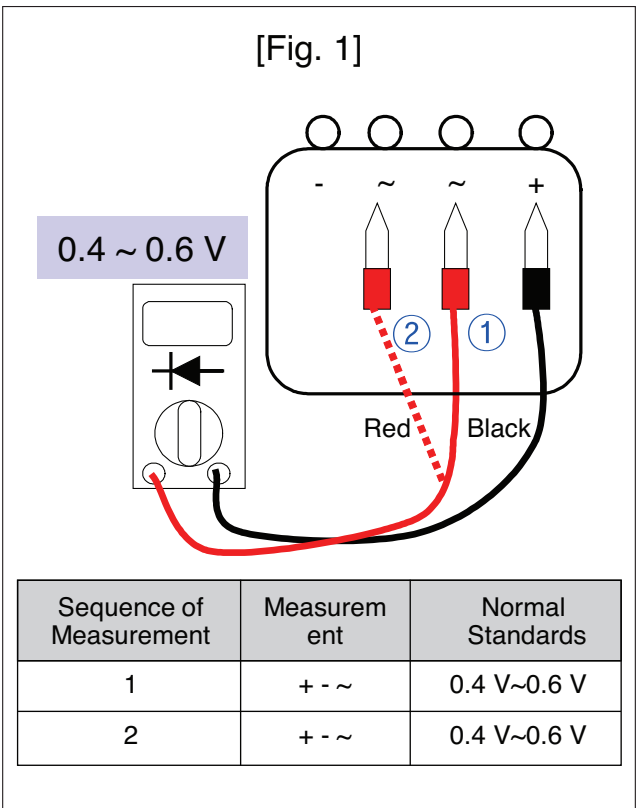
CH 23 (DC Link Voltage Low)

Checking Discrete PFC(PCBA: 4.5kW, 6kW)

Purpose	Checking Bride Diode parts for fault.	Items for checking	1. Checking B/D for damage
---------	---------------------------------------	--------------------	----------------------------

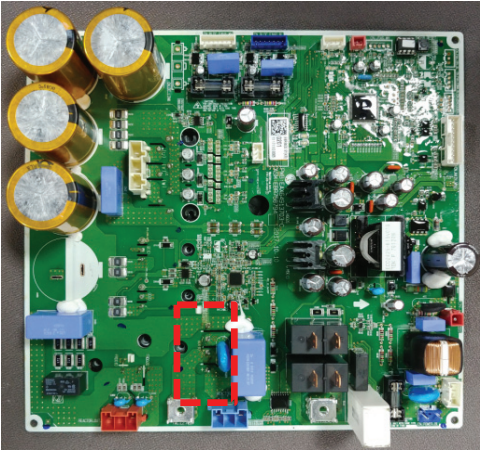
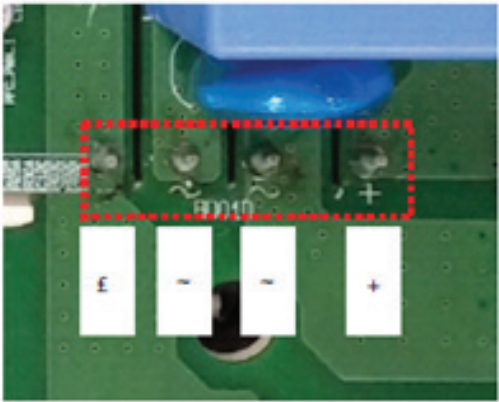
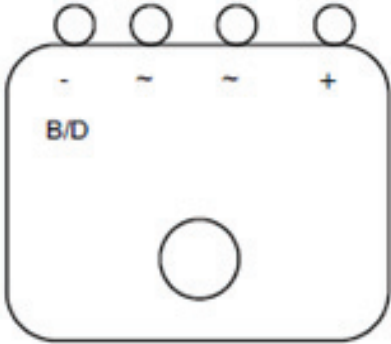
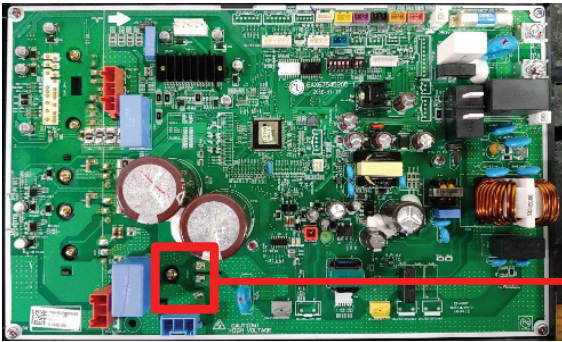
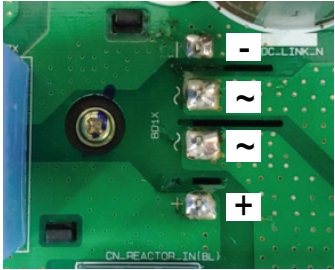
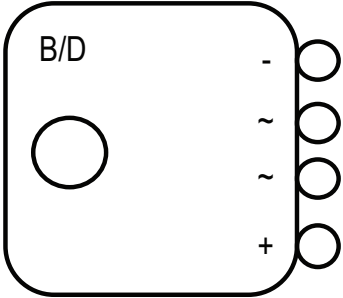
■ How to check B/D of Discrete PFC(Diode Mode)

1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. (→|→ )
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 Bride Diode is deemed to be damaged.

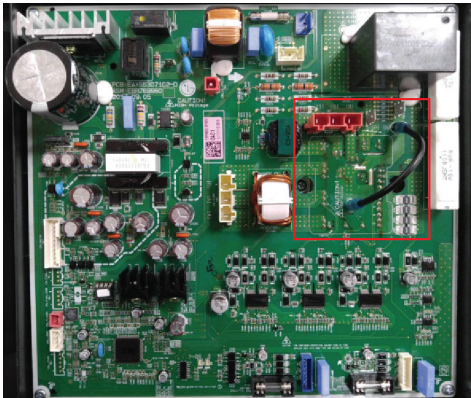





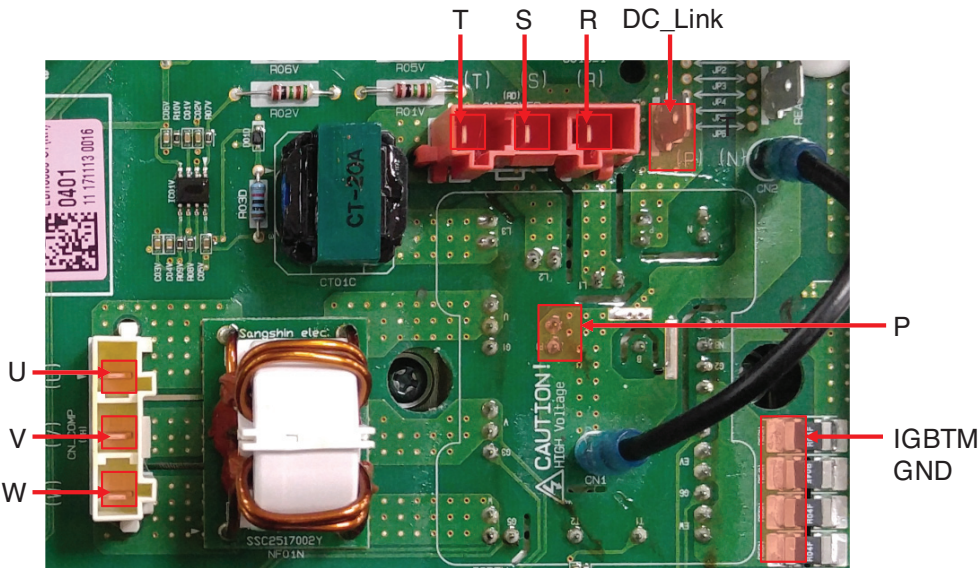
■ B/Diode of Discrete PFC Point

Division	PFCM Point
6 kW	<div></div> <div></div> <div></div>
4.5 kW	<div></div> <div></div> <div></div>

7 kW (U3)



Check Point	Multi Meter			Measured value	
	Mode	BLACK	RED	Normal	Abnormal
IGBTM High side Didoe		DC_Link	R	0.35 V ~ 0.7 V	Non-normal
			S		
			T		
IGBTM Low side Didoe		R	IGBTM GND		
		S			
		T			
IGBTM Hige side IGBT		P	U		
			V		
			W		
IGBTM Low side IGBT	U	IGBTM GND			
	V				
	W				





## 6.7 Troubleshooting Outdoor Error

### CH 24 High pressure switch error

CH24(High pressure switch error) / System is turned off by outdoor unit high pressure switch error

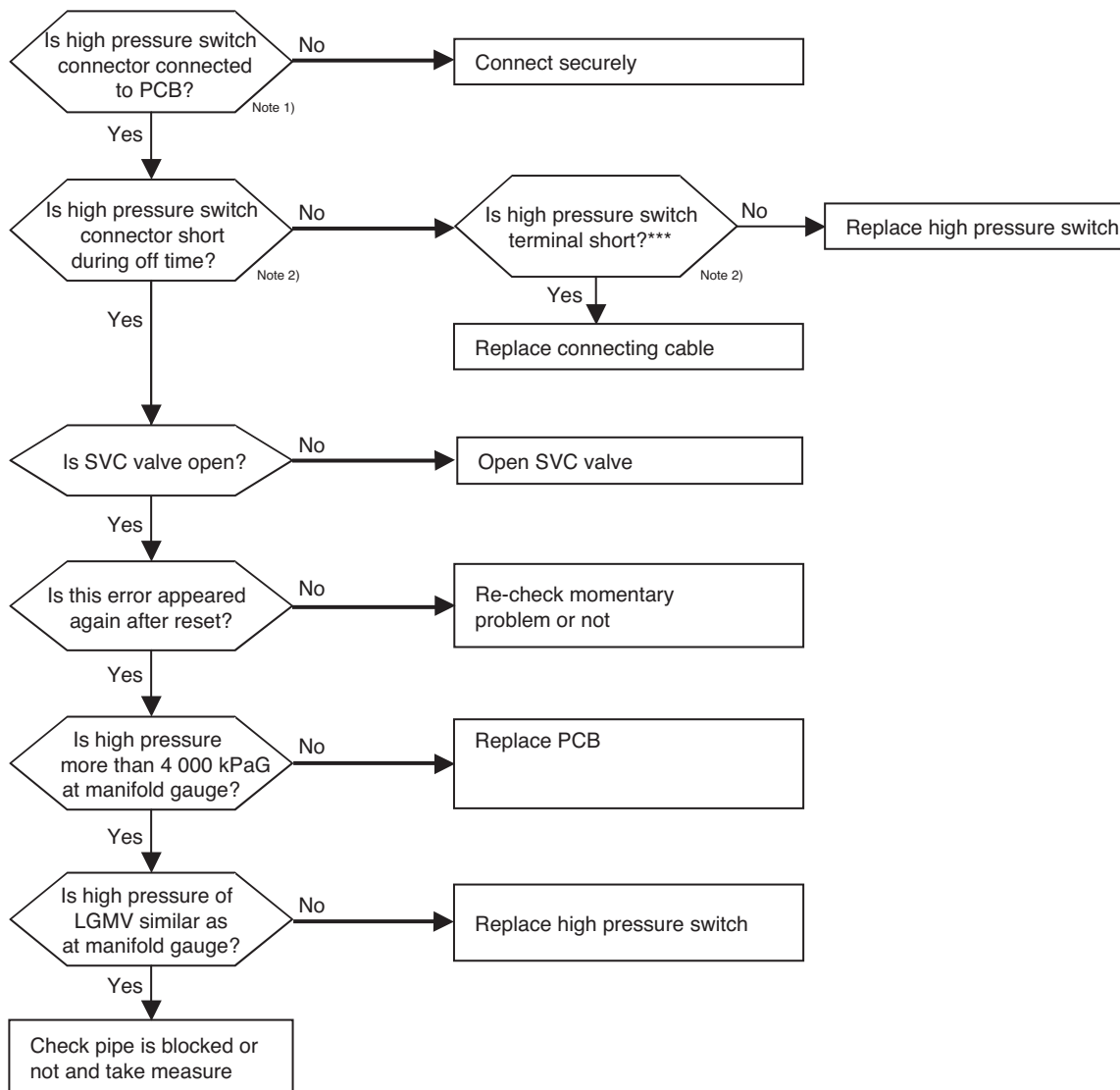
Purpose	Excessive rise of discharge pressure in outdoor compressor
Items for checking	Compressor off due to the high pressure switch in outdoor unit

#### ■ How to check High pressure switch error

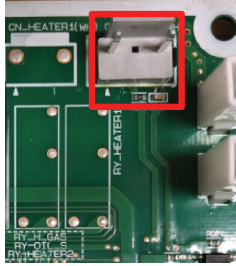


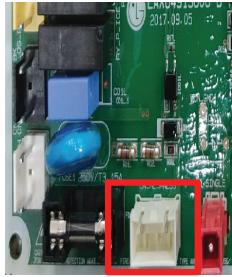
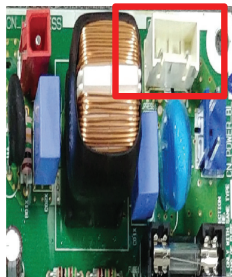
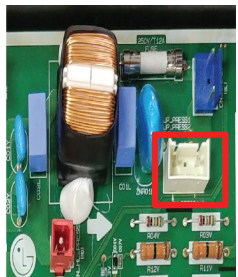
1. Defective high pressure switch
2. Defective fan of indoor unit or outdoor unit
3. Check valve of compressor clogged
4. Pipe distortion due to the pipe damage
5. Refrigerant overcharge
6. Defective EEV at the indoor or outdoor unit
7. Covering or clogging  
(Outdoor covering during the cooling mode / Indoor unit filter clogging during the heating mode)
8. SVC valve clogging
9. Defective outdoor PCB

## 6.7 Troubleshooting Outdoor Error


### ■ Flow of trouble diagnosis



## 5. Trouble Shooting

Note1	Check Point		
UU09/12WR UU18WR UU24WR	2.5 kW	3/4 kW(U24A)	4 kW
			
UU36/42/48/60WR UU37/43/49/61WR	6/7 kW(Main)	6 kW(Inv)	7 kW(Inv)
			

Note2	Check Point	
High pressure switch	Normal : Short Abnormal : Open	
		

## 6.7 Troubleshooting Outdoor Error

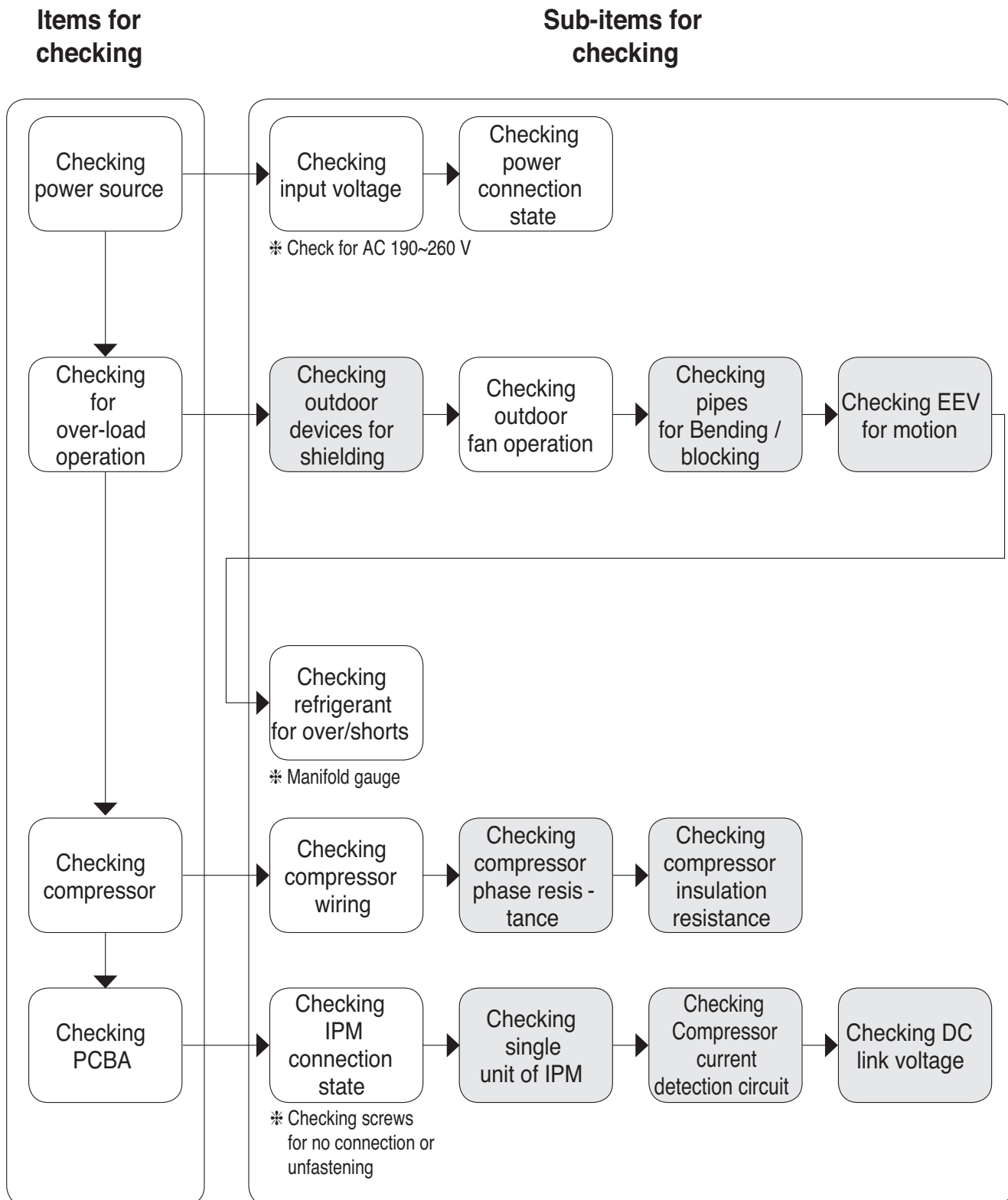
### CH 26 (Compressor Starting Failure)

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

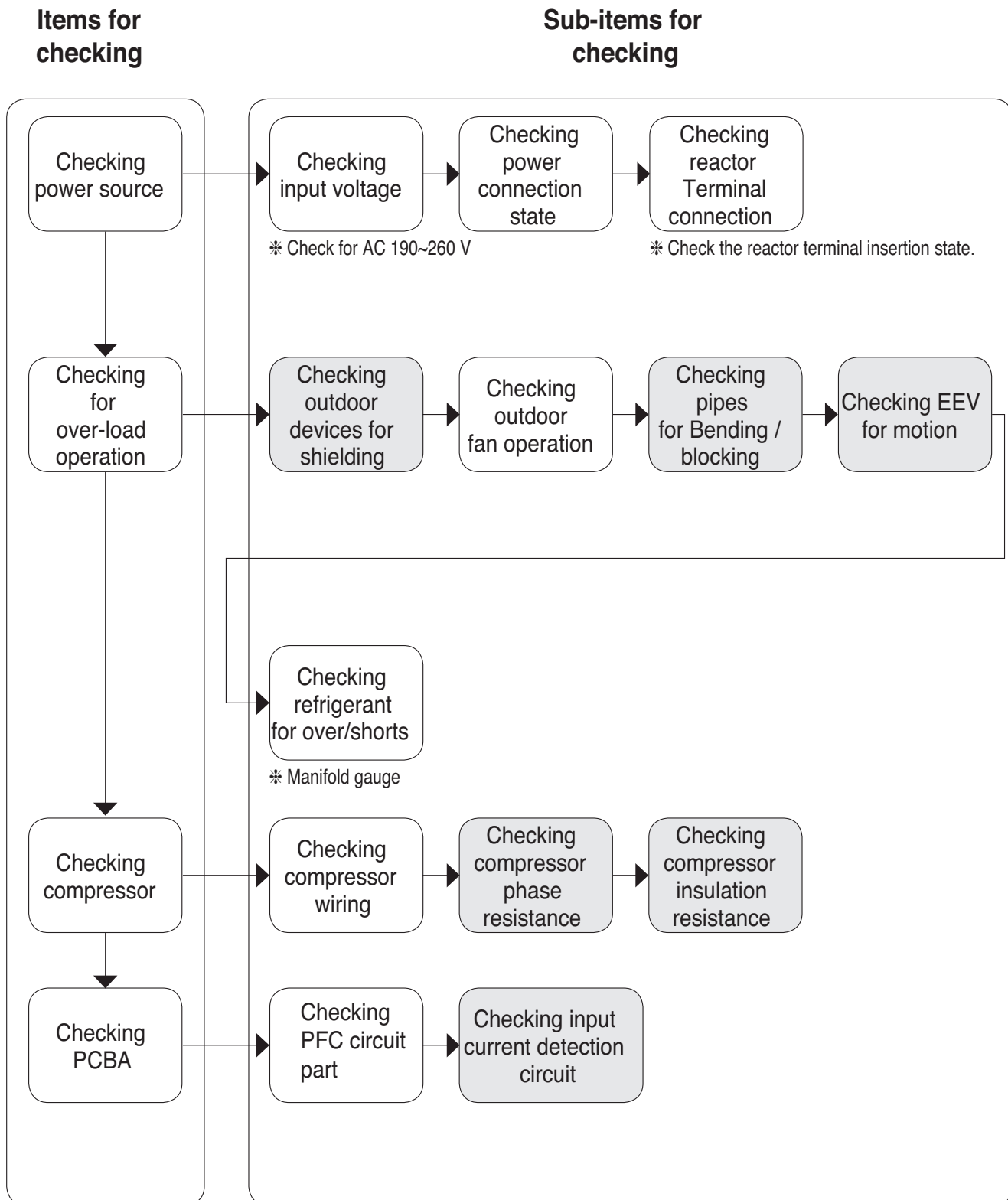
### CH 27/73 (PSC/PFC Fault Error)

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

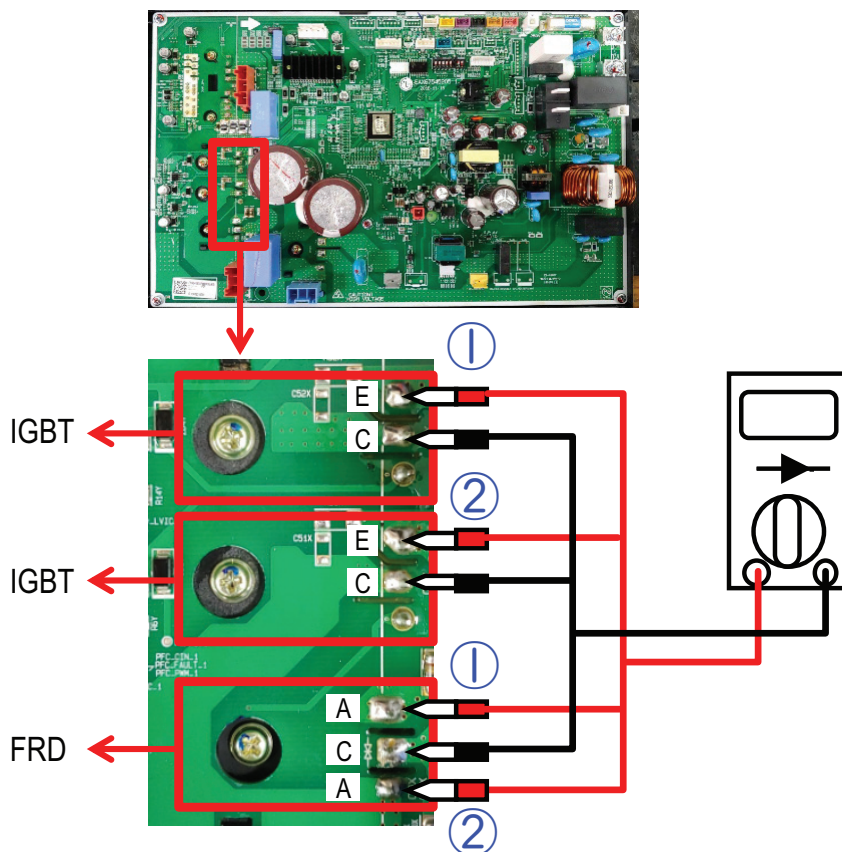
CH 27/73 (PSC/PFC Fault Error)

### Checking Discrete PFC part

<b>Purpose</b>	Checking Discrete PFC parts for fault	<b>Items for checking</b>	1. Checking IGBT for damage 2. Checking FRD for damage
----------------	---------------------------------------	---------------------------	---

#### ■ How to check IGBT, FRD (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 IGBT, FRD is deemed to be damaged.



< IGBT >

Sequence of Measurement	Measurement	Normal Standards
1	C – E	0.3 V~0.5 V
2	C – E	0.3 V~0.5 V

※ C : Collector / E : Emitter

< FRD >

Sequence of Measurement	Measurement	Normal Standards
1	A – C	0.3 V~0.5 V
2	A – C	0.3 V~0.5 V

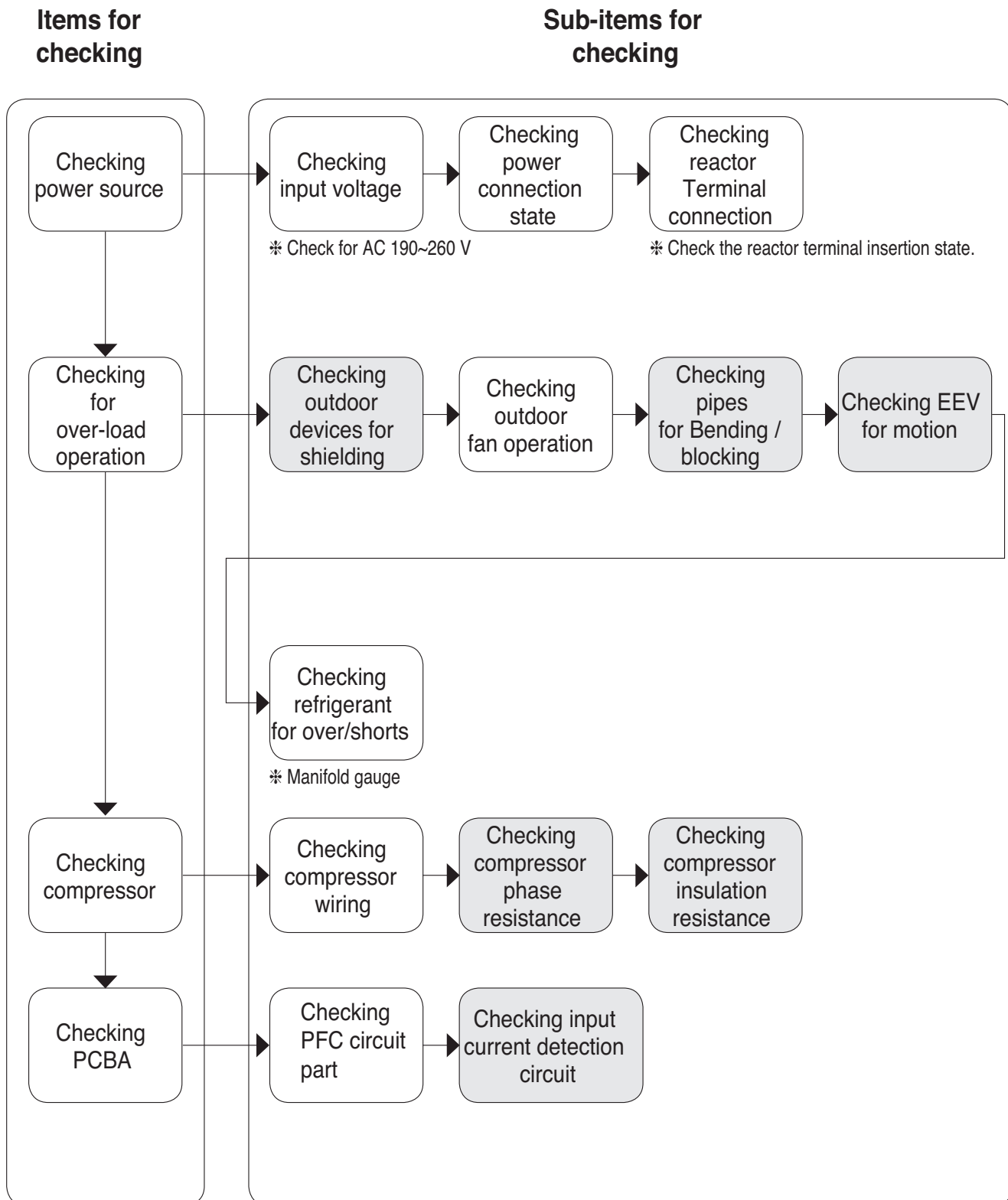
※ A : Anode / C : Cathode



## 6.7 Troubleshooting Outdoor Error

CH 27/73 (PSC/PFC Fault Error)

### Flow of trouble diagnosis



6.7 Troubleshooting Outdoor Error

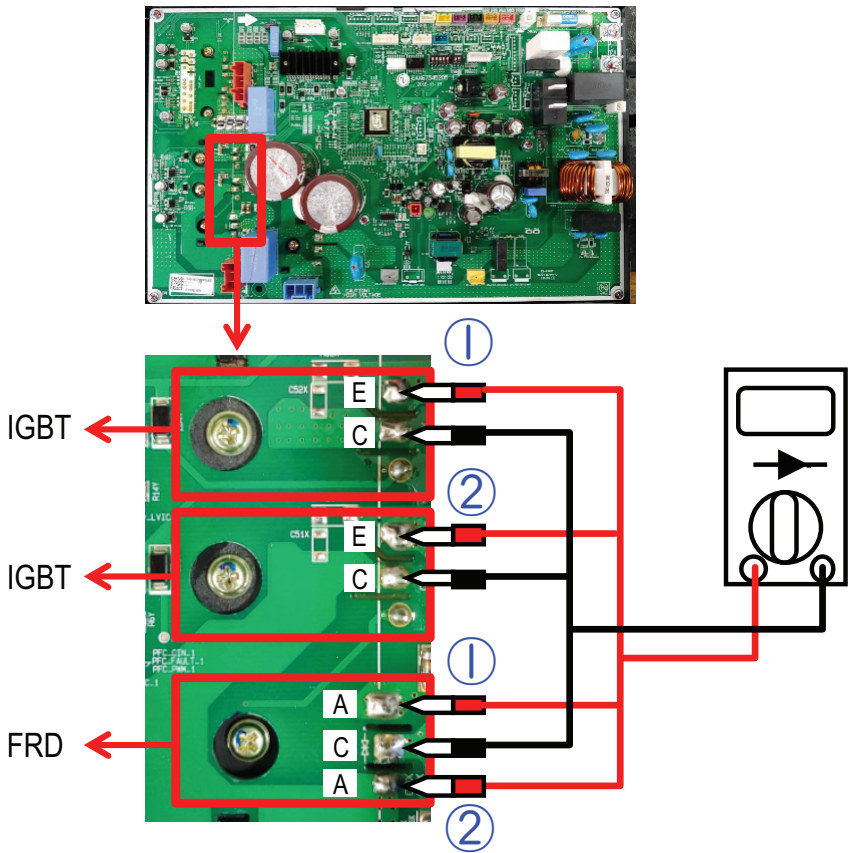
CH 27/73 (PSC/PFC Fault Error)

Checking Discrete PFC part

Purpose	Checking Discrete PFC parts for fault	Items for checking	1. Checking IGBT for damage 2. Checking FRD for damage
---------	---------------------------------------	--------------------	---

How to check IGBT, FRD (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 IGBT, FRD is deemed to be damaged.



< IGBT >

Sequence of Measurement	Measurement	Normal Standards
1	C – E	0.3 V~0.5 V
2	C – E	0.3 V~0.5 V

※ C : Collector / E : Emitter

< FRD >

Sequence of Measurement	Measurement	Normal Standards
1	A – C	0.3 V~0.5 V
2	A – C	0.3 V~0.5 V

※ A : Anode / C : Cathode

## 6.7 Troubleshooting Outdoor Error

### CH 32 (Discharge pipe overheating error of Inverter)

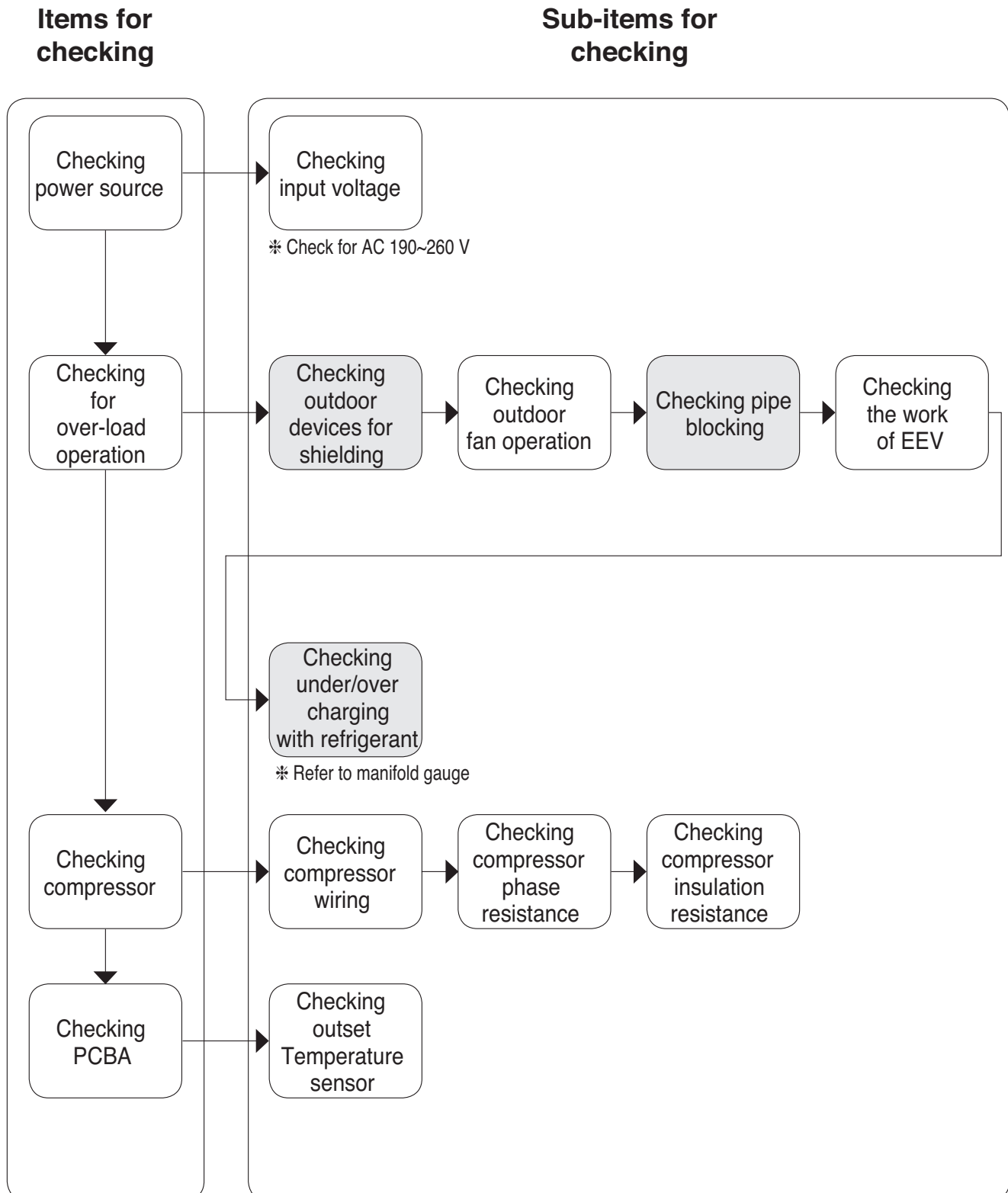
Items		Contents
Purpose		Possible damage of compressor and piping due to high discharge temperature
Condition for Generation		The discharge temperature is elevated exceeding the standard.
Expected Causes	Installation	Installation fault, closing of SVC valve, under/over charging with refrigerant, and 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

### CH 35 (Discharge pipe overheating error of Inverter)

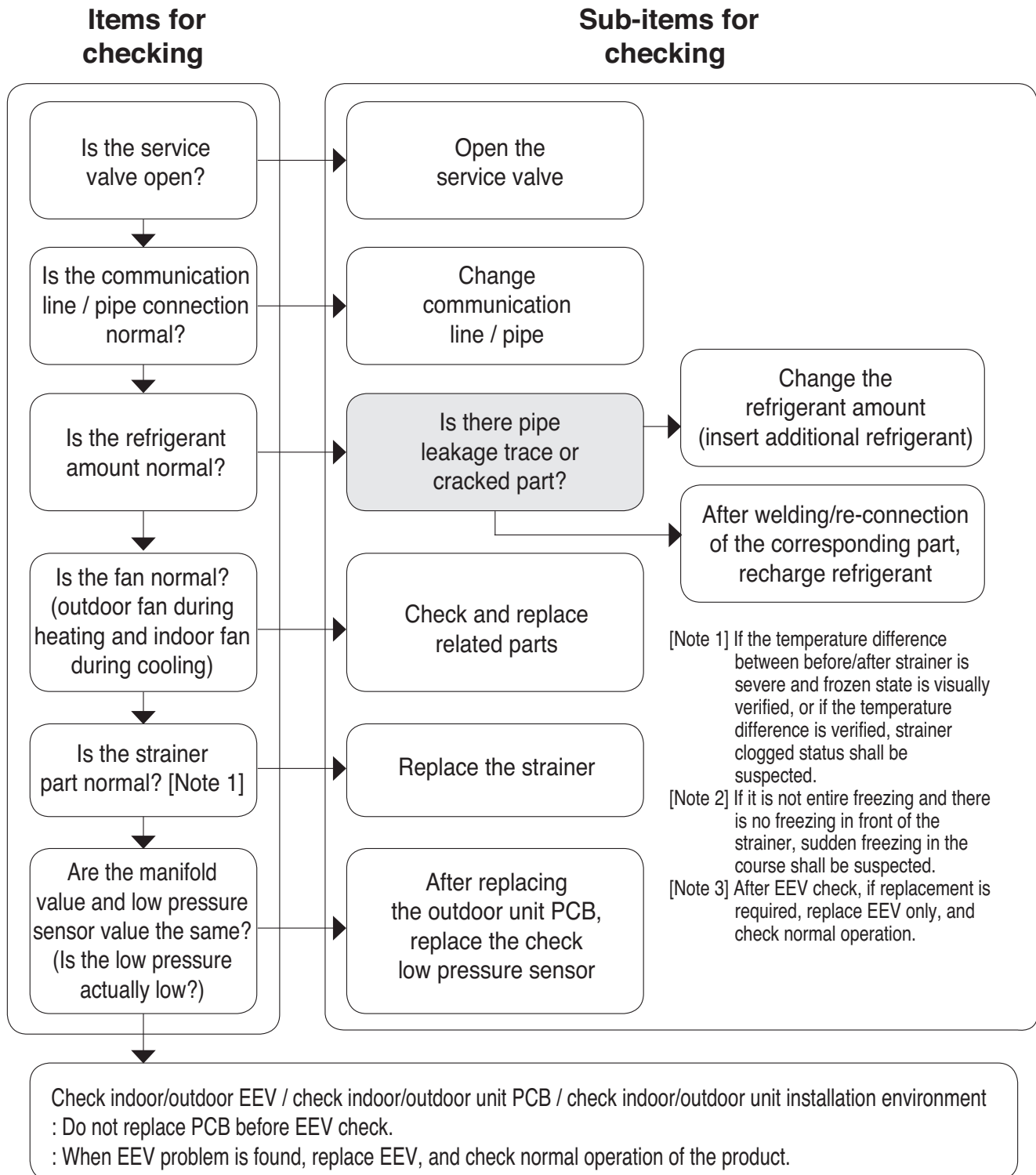
Items		Contents
Purpose		Possible damage of compressor due to excessive low pressure
Condition for Generation		The low pressure of outdoor unit is decreased excessively.
Expected Causes	Installation	Lack and leakage of refrigerant Service valve clogged in case of deformation or shielding by refrigeration pipe damage (outdoor unit shielding during heating / indoor filter clogging during cooling)
	PCB Assembly	Outdoor unit PCB defect
	Sensor	Low pressure sensor defect Indoor pipe temperature sensor defect
	Others	Indoor unit or outdoor unit fan failure EEV defect

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

## 6.7 Troubleshooting Outdoor Error

CH 35 (Discharge pipe overheating error of Inverter)

### Flow of trouble diagnosis



**! Caution** : Before checking PCB or various outdoor unit electricity flowing parts, start the checking 3 minutes after power cut off. If it is measured in power supply stand by state, check the tester's measurement mode and be careful of the short circuit with parts other than the measurement part.

## 6.7 Troubleshooting Outdoor Error

### CH 38 (Refrigerant leakage error)

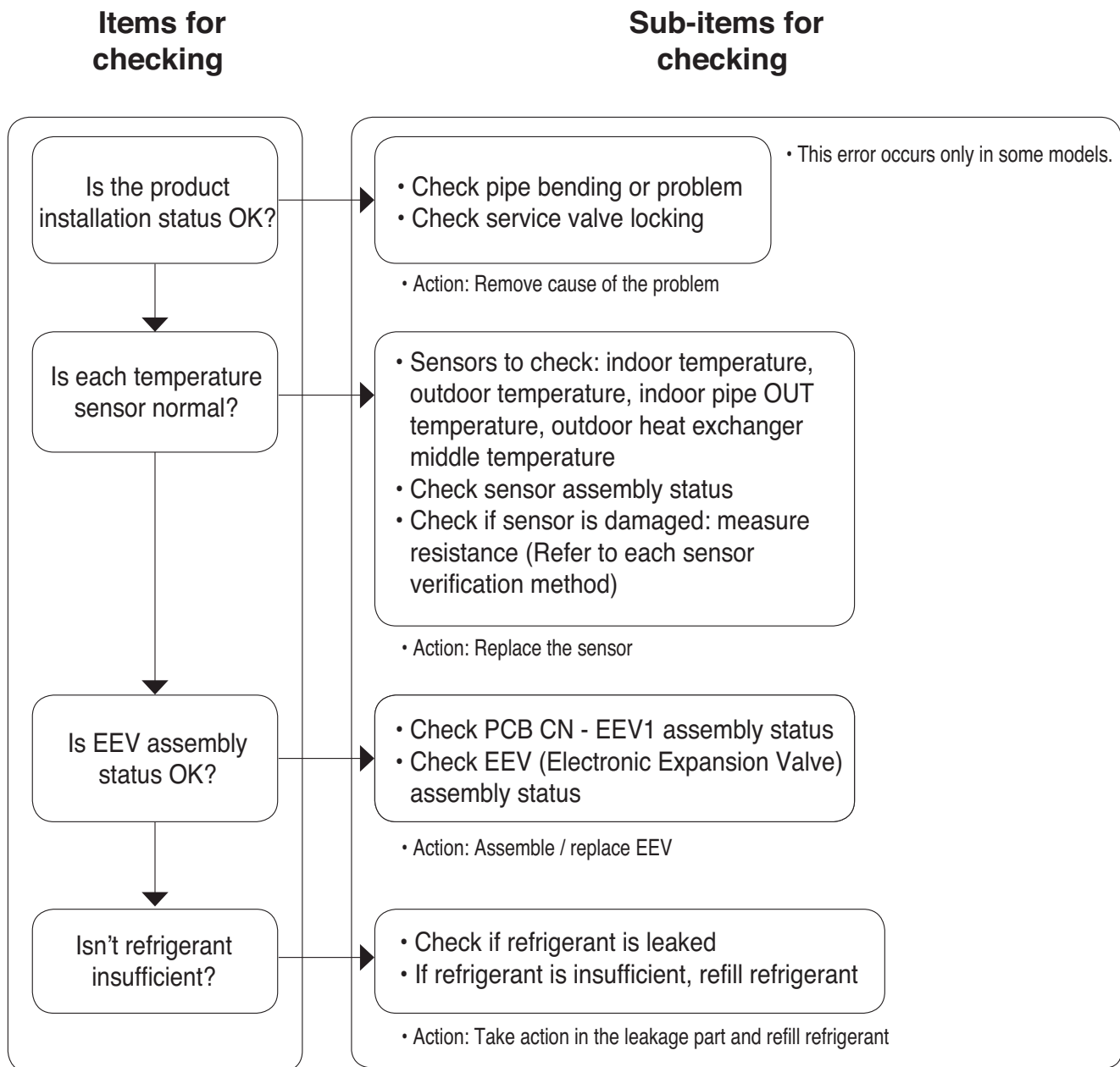
Items		Contents
Purpose		Possible damage of compressor due to refrigerant leakage or lack
Condition for Generation		If refrigerant is insufficient or if refrigerant is leaked
Expected Causes	Installation	Refrigerant leakage (insufficient) Service valve locked Pipe bending defect
	Sensor	Sensor defect
	Others	EEV connector falling off / EEV assembly defect

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

## 6.7 Troubleshooting Outdoor Error

### CH 38 (Refrigerant leakage error)

#### Flow of trouble diagnosis



**! Caution :** Before checking PCB or various outdoor unit electricity flowing parts, start the checking 3 minutes after power cut off. If it is measured in power supply stand by state, check the tester's measurement mode and be careful of the short circuit with parts other than the measurement part.



## 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 kΩ ± 10 %

Piping : 5 kΩ ± 10 %

Air : 10 kΩ ± 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 1MΩ.

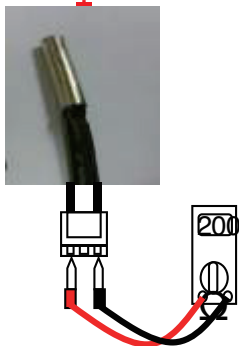
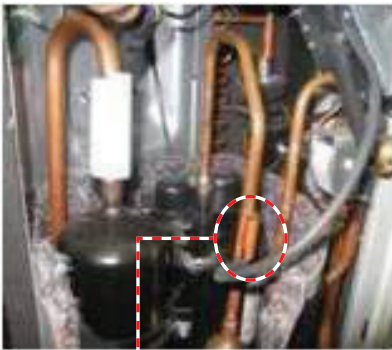
## 6.7 Troubleshooting Outdoor Error

### Sensor Checking Methods

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

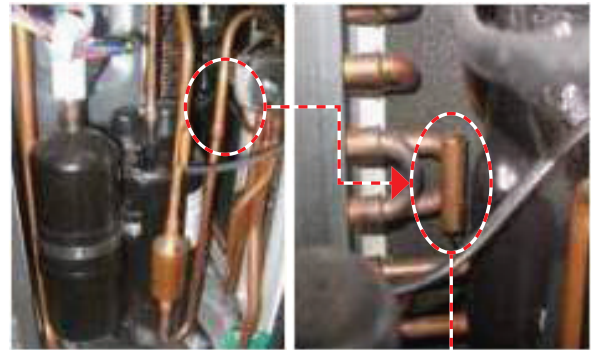
#### ① Compressor discharge sensor

- Position : Outlet of compressor
- Sensor value :  $200\text{ k}\Omega \pm 10\%$   
(Based on  $25\text{ }^{\circ}\text{C}$ )



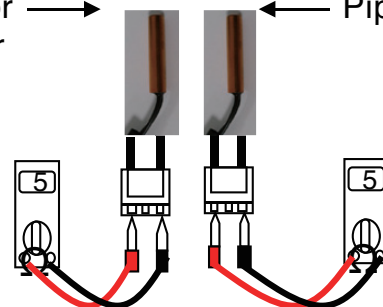
#### ② Pipe sensor

- Position : Compressor inlet and pipe
- Sensor value :  $5\text{ k}\Omega \pm 10\%$   
(Based on  $25\text{ }^{\circ}\text{C}$ )



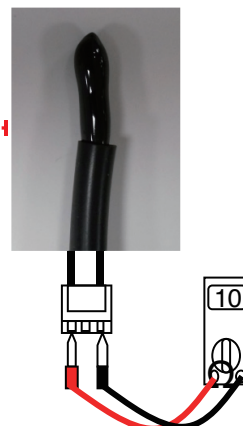
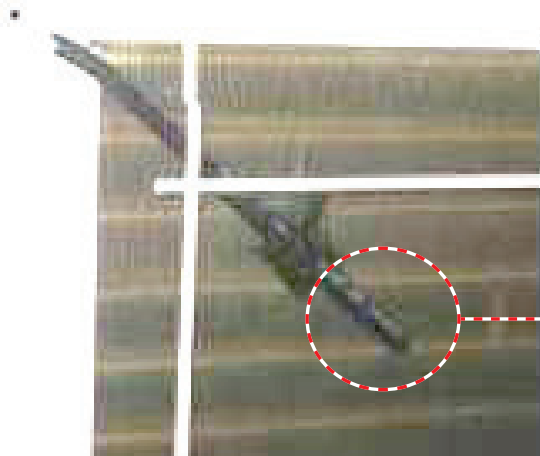
Compressor  
inlet sensor

Pipe sensor



#### ③ Outdoor temperature sensor

- Position : Rear part of outdoor device
- Sensor value :  $10\text{ k}\Omega \pm 10\%$   
(Based on  $25\text{ }^{\circ}\text{C}$ )

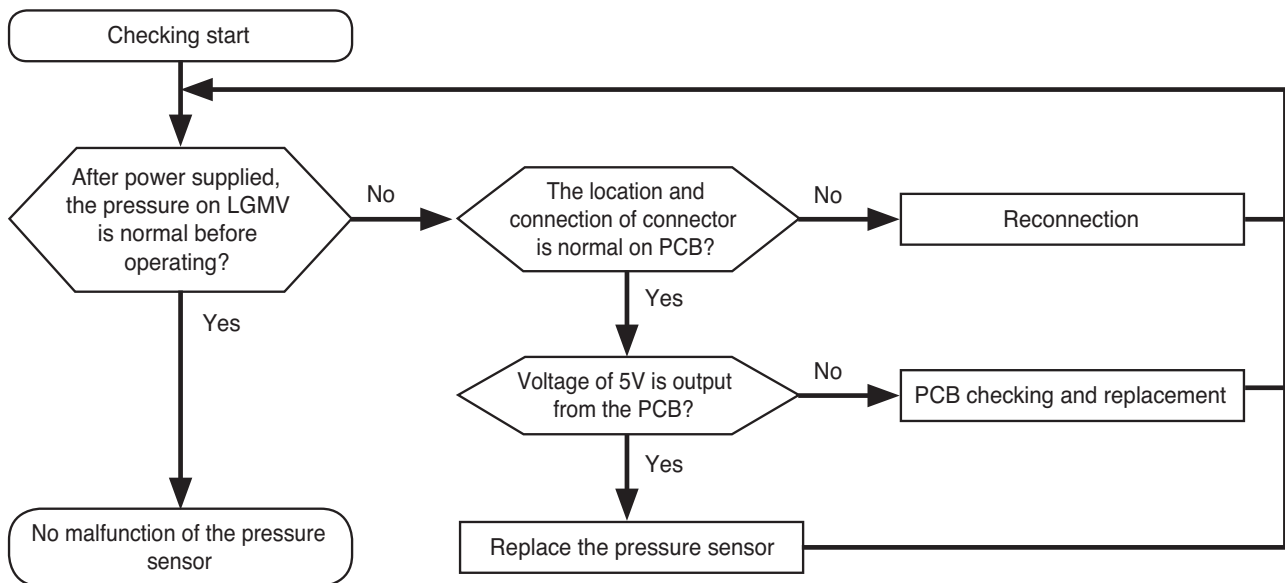


## 6.7 Troubleshooting Outdoor Error

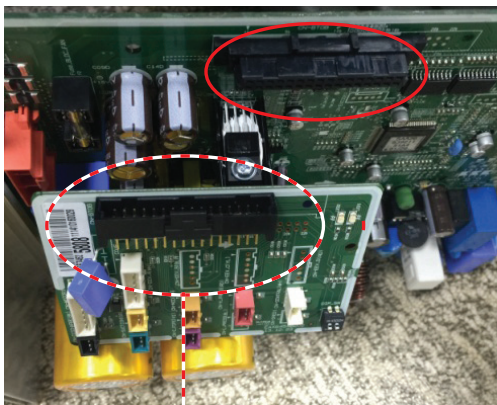
<b>Purpose</b>	Checking single units of sensors for fault	<b>Items for checking</b>	Measurement of the unique resistance by sensor temperature.
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### ④ Pressure sensor

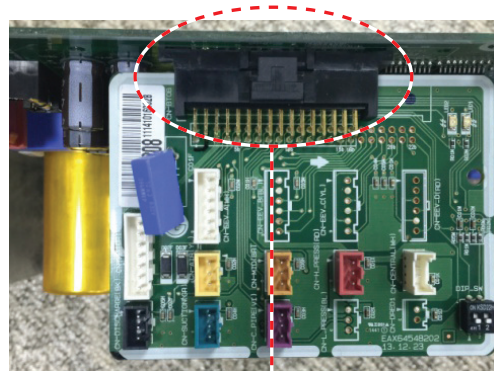
- Position : Outlet of 4-way valve (based on cooling mode)



- In case of UU09WR, UU12WR Model, 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



Same capacity → ok



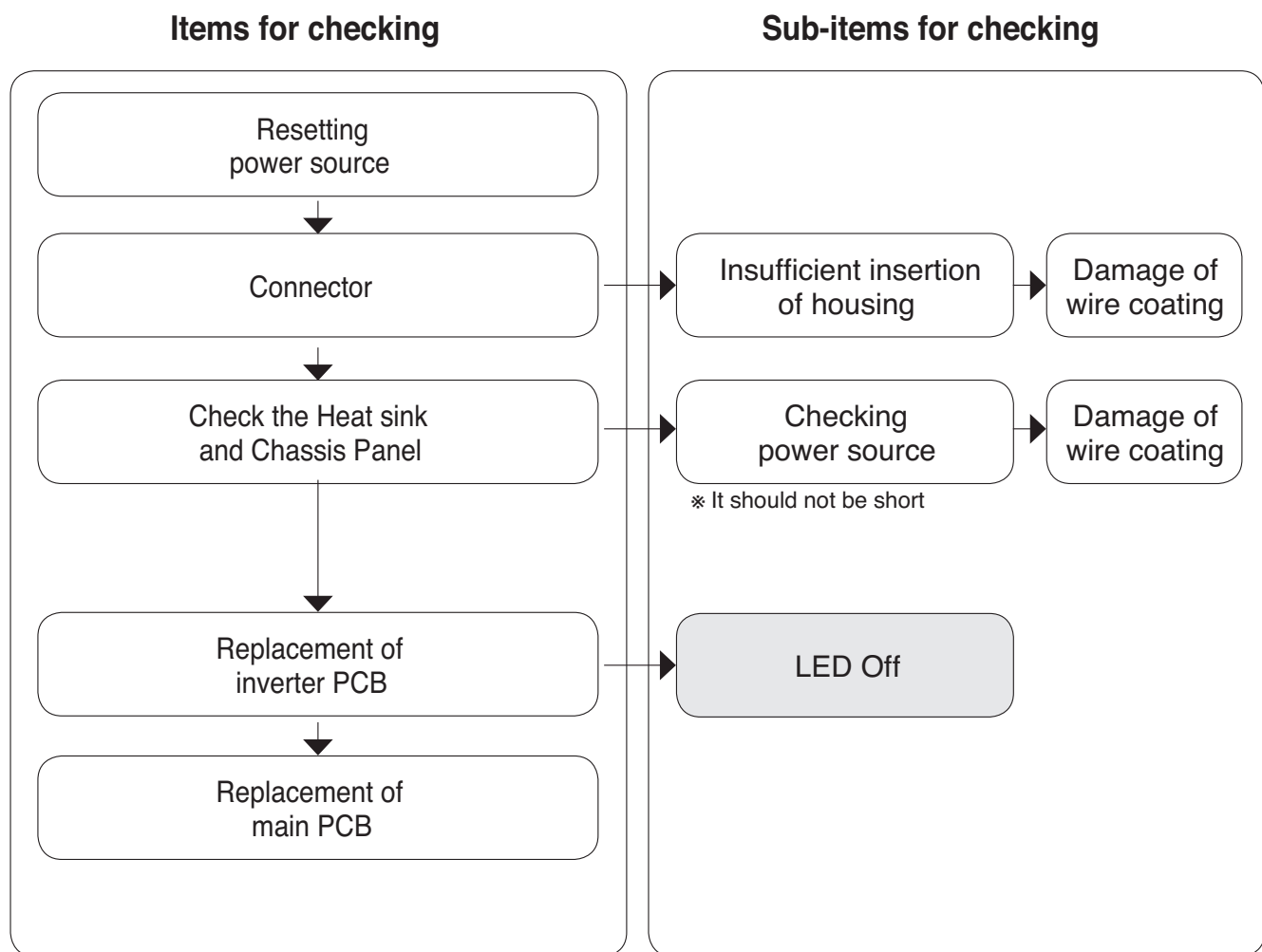
Indoor capacity > Outdoor capacity → NG

## 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.



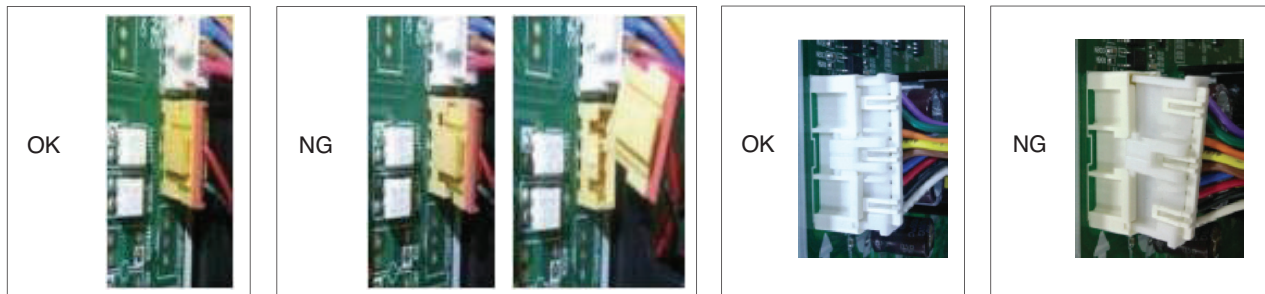
## 6.7 Troubleshooting Outdoor Error

### CH 52 (PCB Communication Error)

#### Environment interfering PCB communication

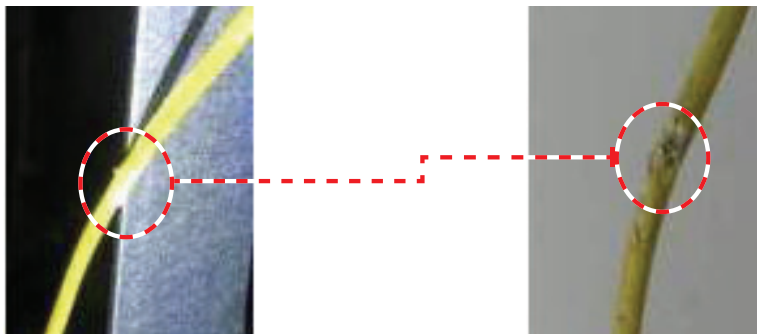
Purpose	Installation environment interfering the communication	Items for checking	Checking method of faulty points
---------	--	--------------------	----------------------------------

#### ① Insufficient insertion of wires



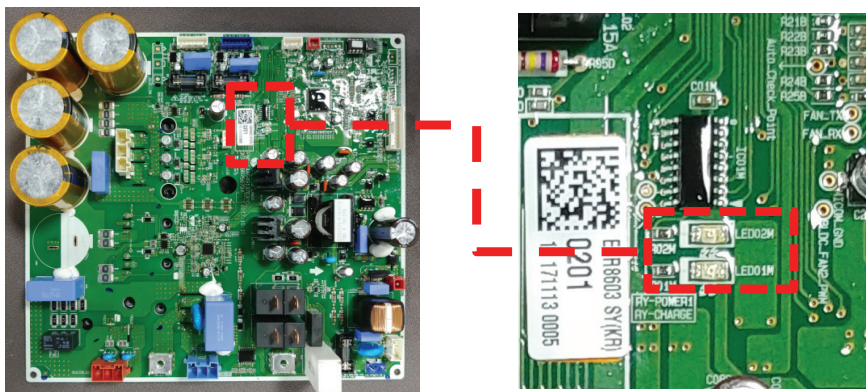
#### ② Damage of wire coating

: Interference with wires or wire coating damage with chopping



#### ③ Inverter PCB LED

: Replacement of inverter PCB during LED Off after resetting



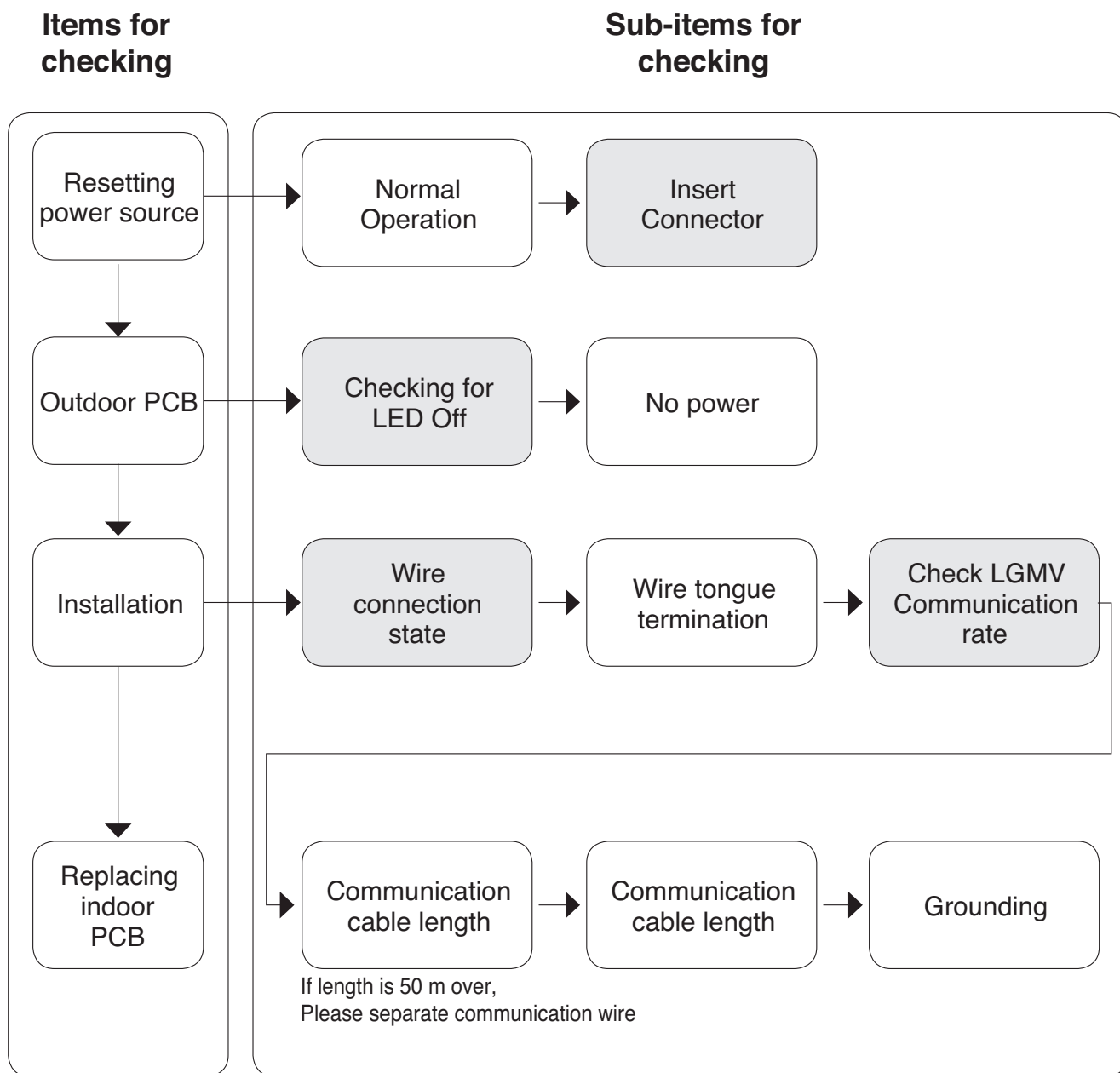


## 6.7 Troubleshooting Outdoor Error

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

Items	Contents
Purpose	1. Damage of high pressure switch (Check the high pressure switch) 2. Damage due to incorrect installation of outdoor device PCB
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.




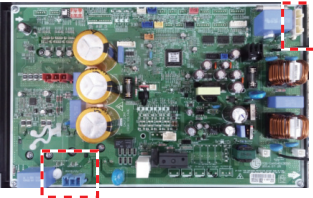
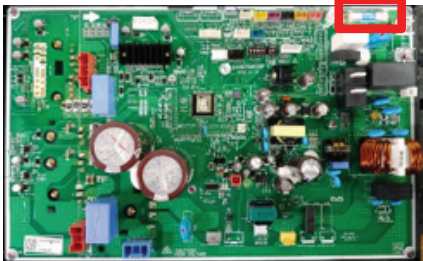
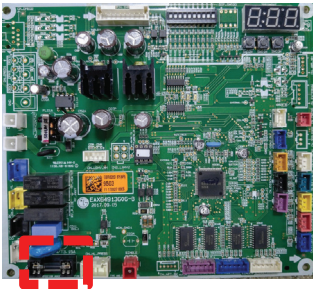
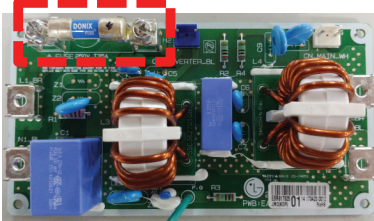
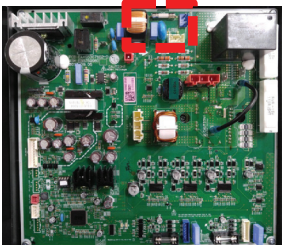
## 6.7 Troubleshooting Outdoor Error

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

### Checking Method of Outdoor PCB

<b>Purpose</b>	Checking whether outdoor PCB is normal	<b>Items for checking</b>	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.

Division	Fuse Point	
2/2.5 kW		
4 kW		
4.5 kW		
6 kW		
7 kW		



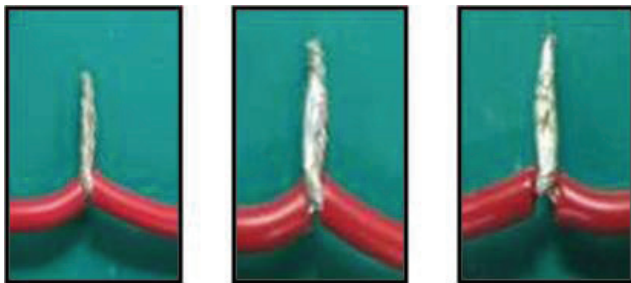
## 6.7 Troubleshooting Outdoor Error

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.

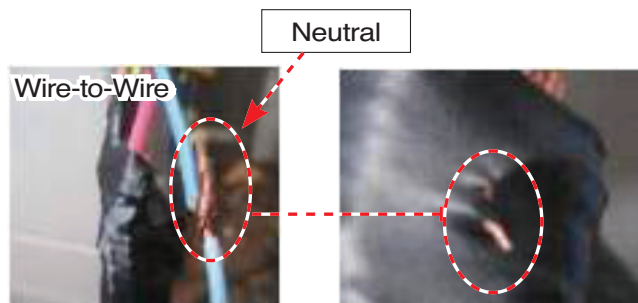


NG

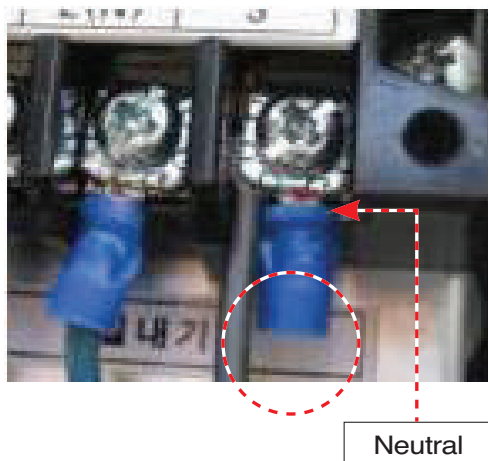
NG

OK

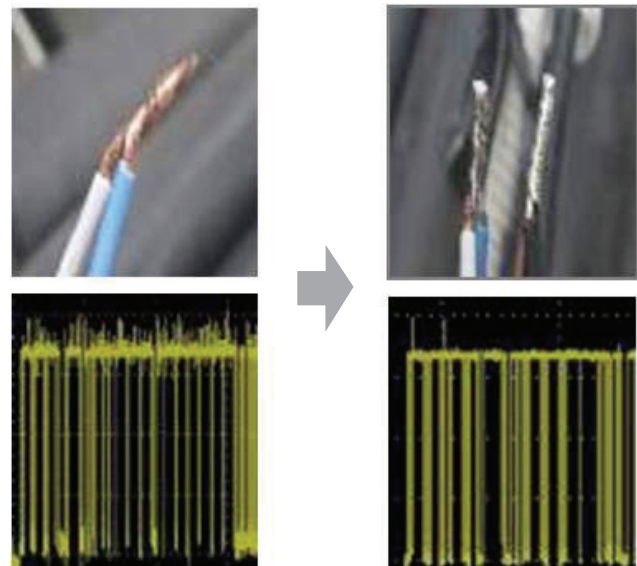
- ③ The cut section of the wire passes the insulation tape and causes a short with another wire.



- ② Wire tongue-termination fault.



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

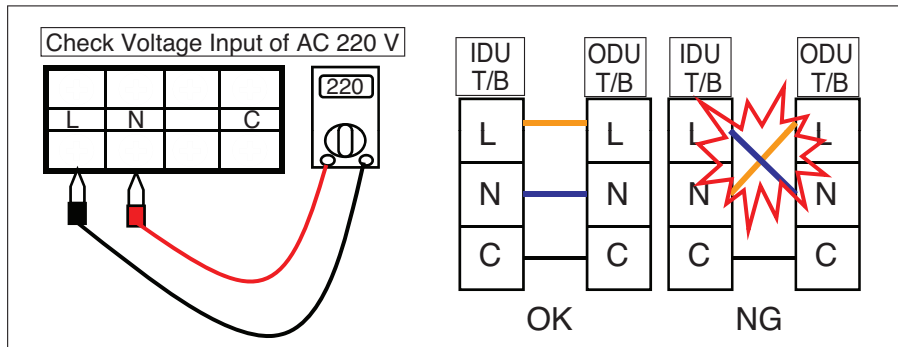


1) Check Voltage Input of AC 220 V, Indoor & Outdoor Communication

When Input AC 220 V,

- Check AC 220 V Live ↔ Netural, Indoor & Outdoor
- Otherwise, arrange the Communication Wire, Check AC 220 V

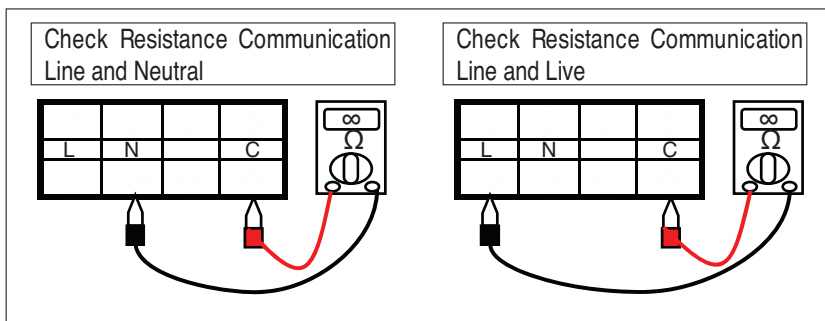
Equipment : Multi-Meter  
Test Mode : AC Voltage  
Indoor & Outdoor Terminal block



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 ↔ Netural should be infinite
- Check resistance Communication ↔ Gnd should be infinite

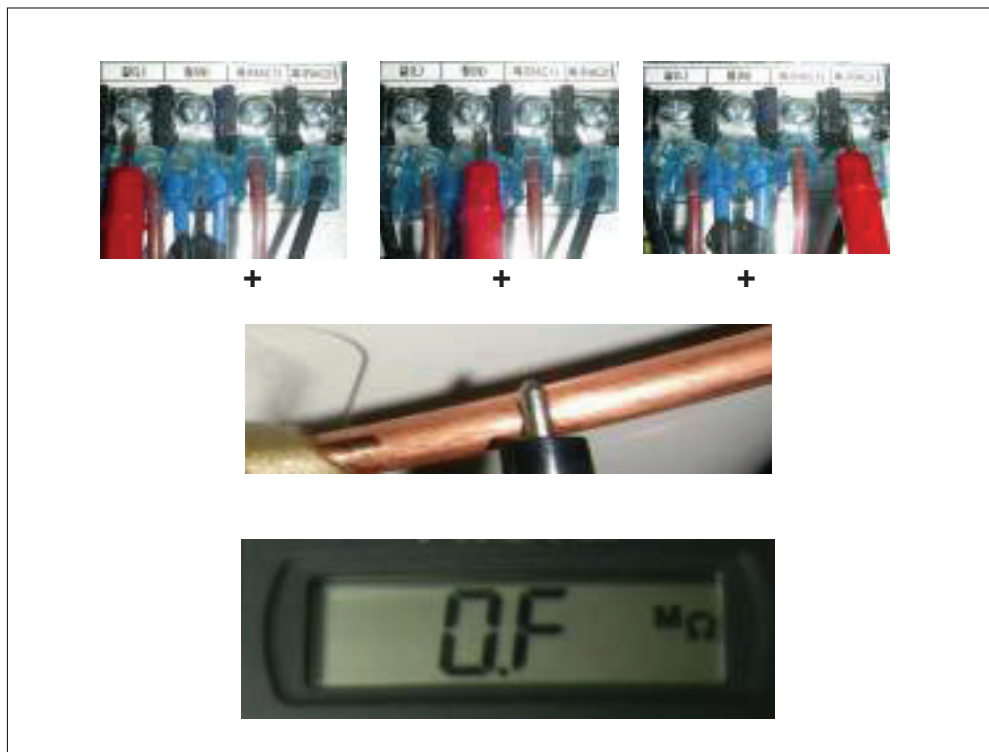
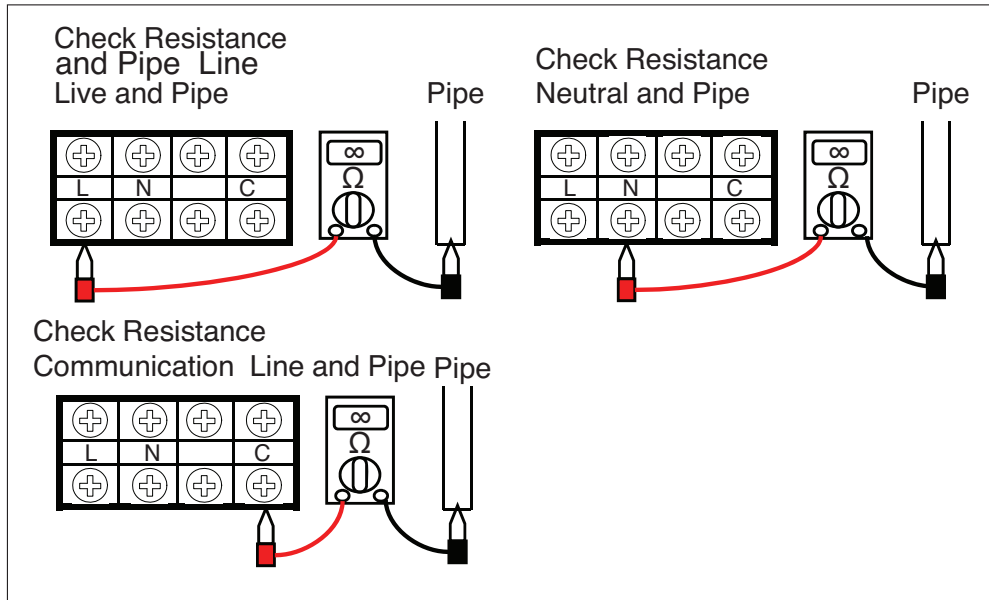


## 5. Trouble Shooting

### 3) Check electric leakage Communication Line and Pipe

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

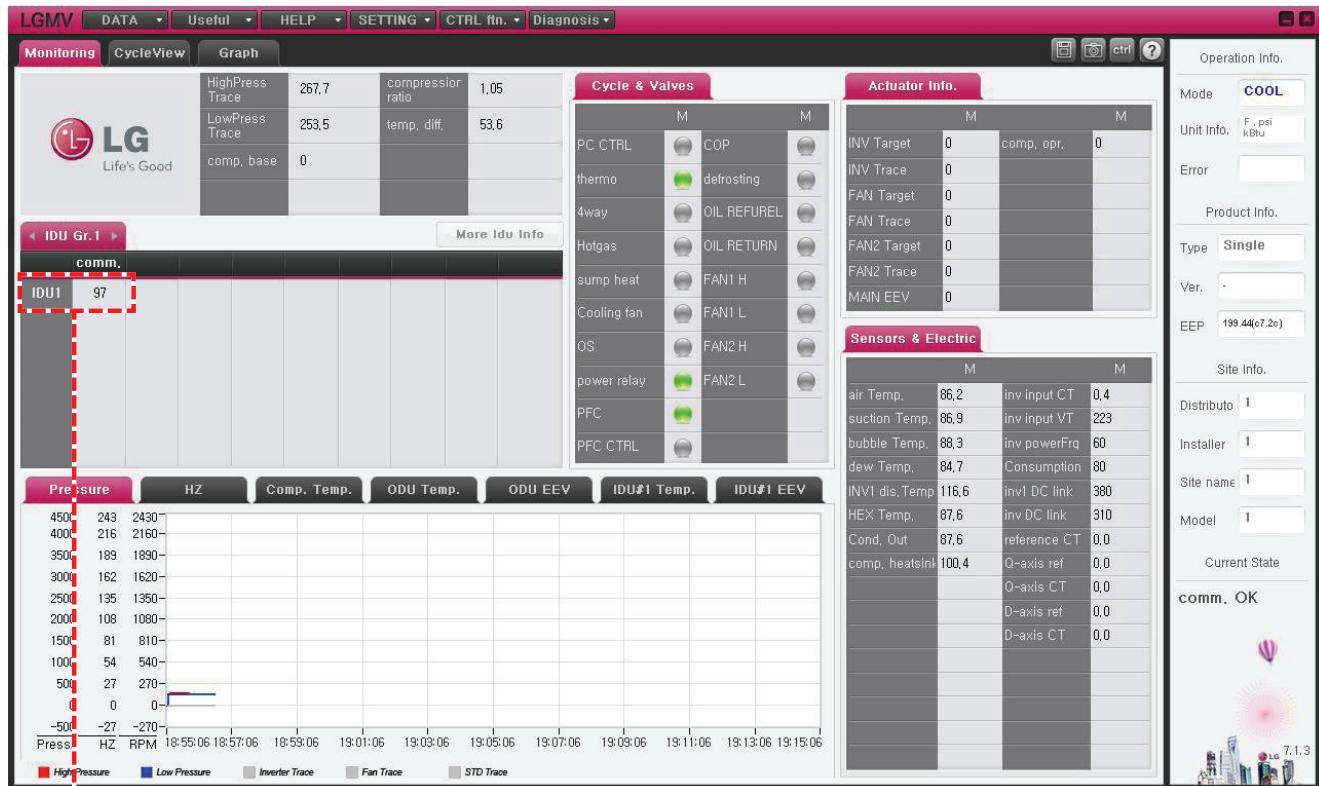
- Check Infinite Resistance between Power /Communication Line and Pipe Line



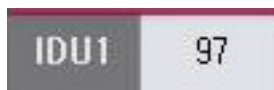
## 6.7 Troubleshooting Outdoor Error

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

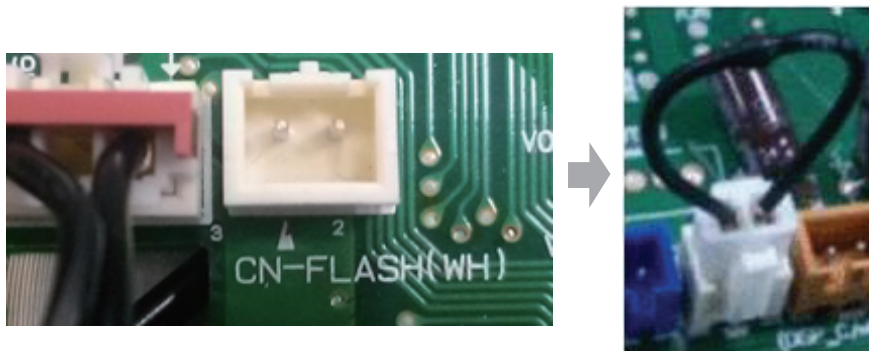
- Outdoor unit cannot communicate with Indoor unit.
- Outdoor reset then work normal.  
: It happens intermittently
- LEDs for showing power-on and communication status are not on or not blinking in outdoor inverter PCBA

#### 2. Causes

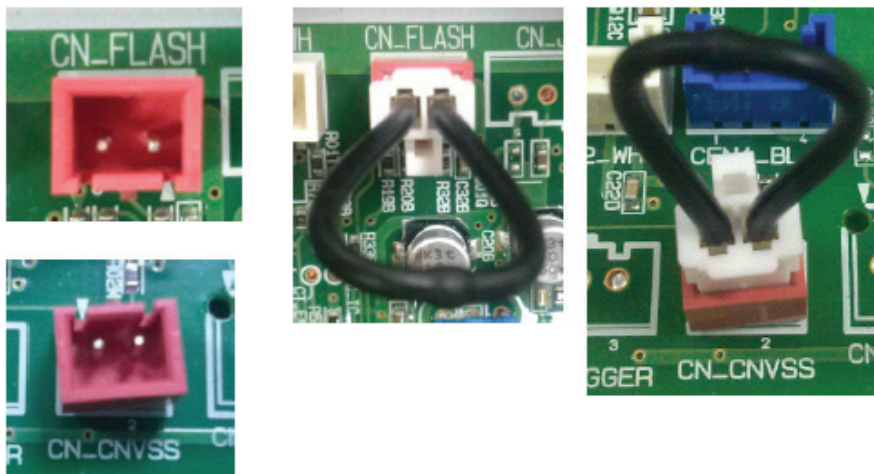
- Noise disturb the outdoor unit communication with indoor unit

#### 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]



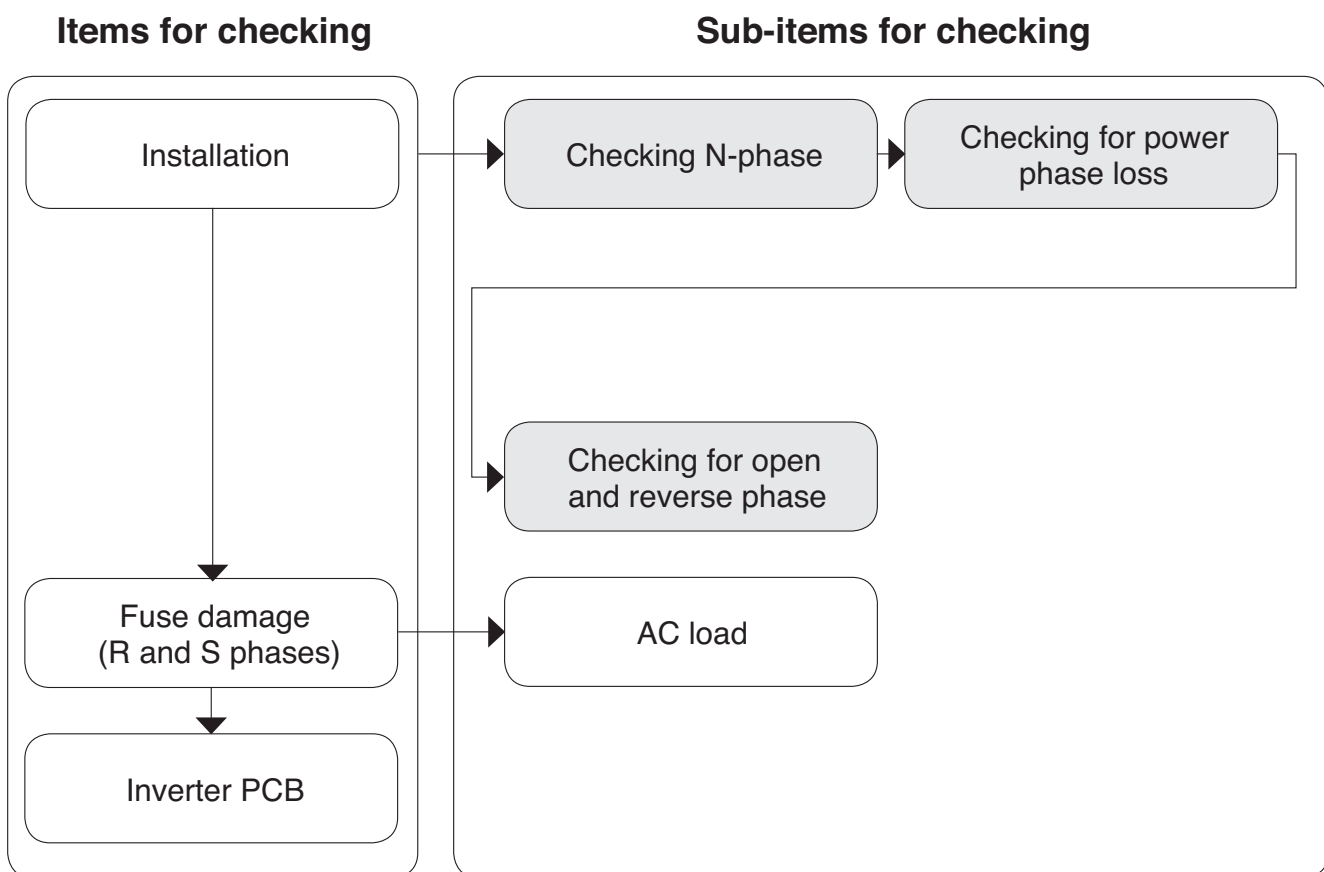
Connector with capacitor in CN\_FLASH and CMN\_CNVS

## 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.



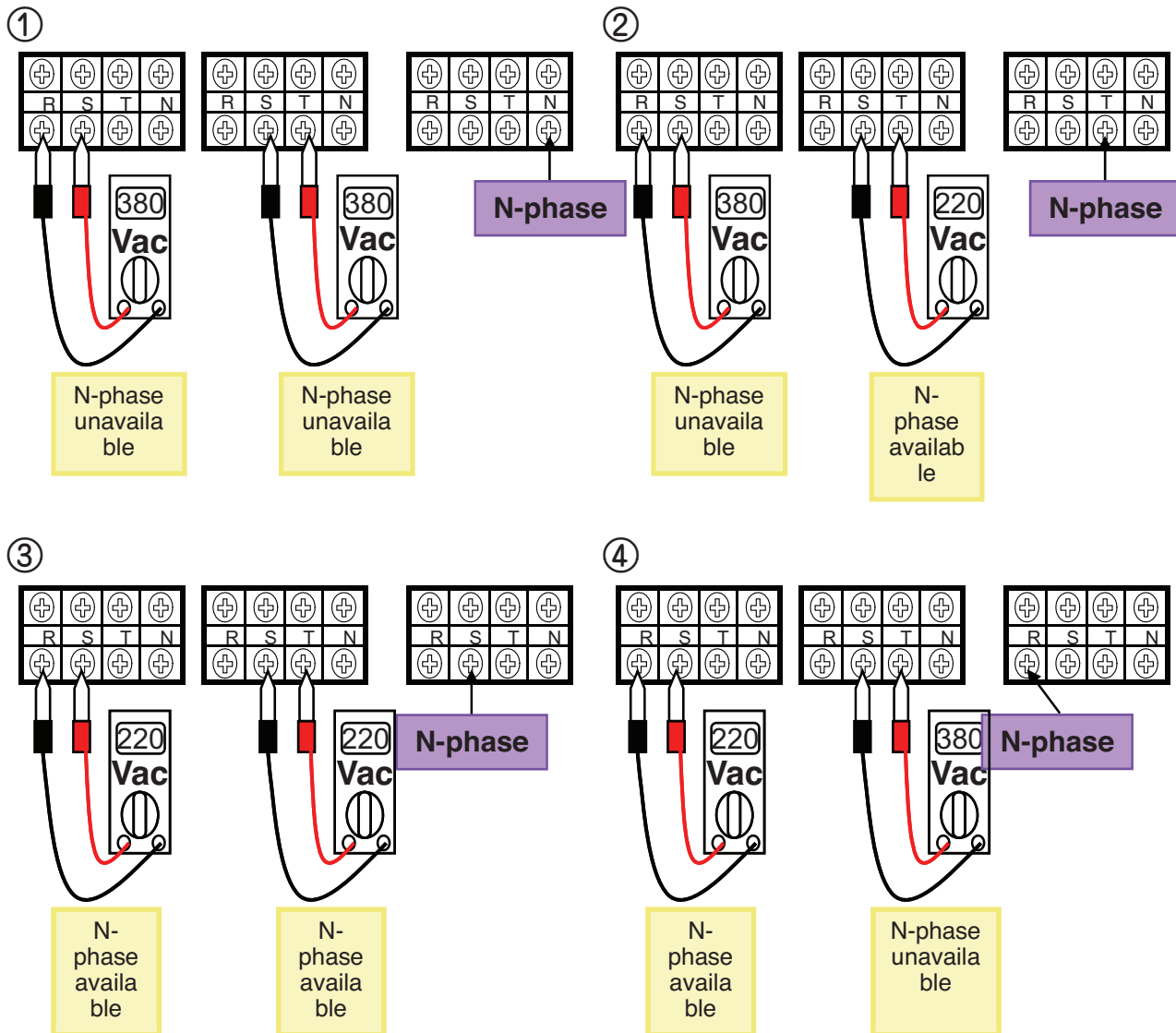


## 6.7 Troubleshooting Outdoor Error

### 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)

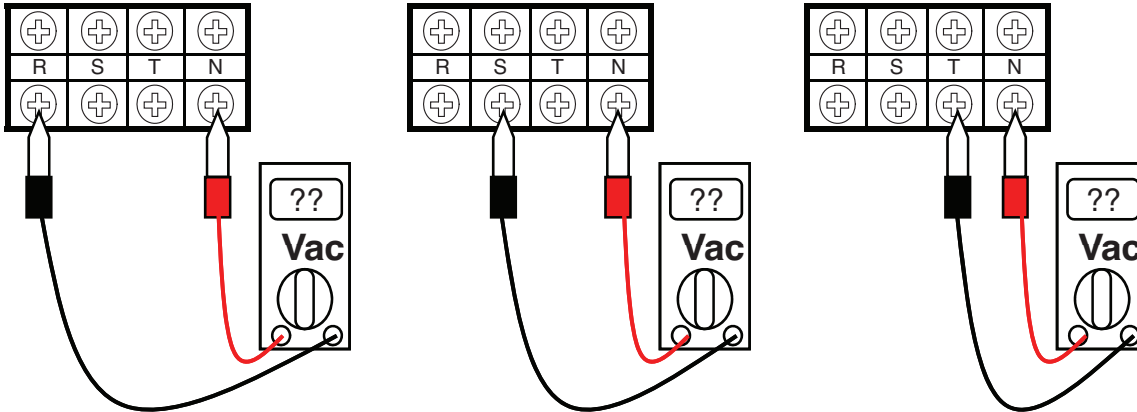


## 6.7 Troubleshooting Outdoor Error

### CH 54 (Open and Reverse Phase Error)

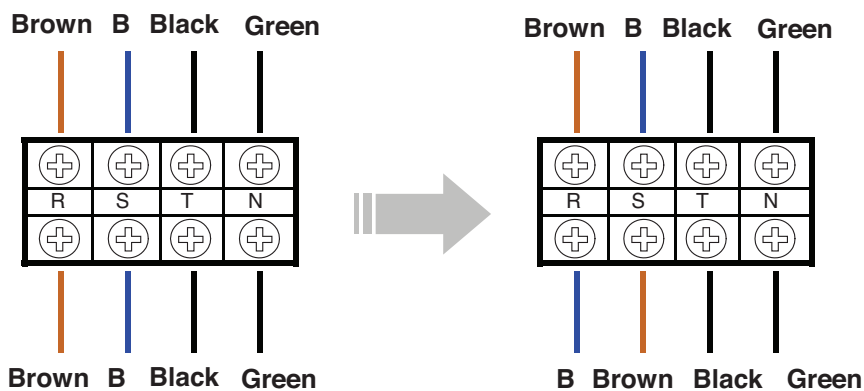
#### Judgment Method of R,S,T phase loss

- 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





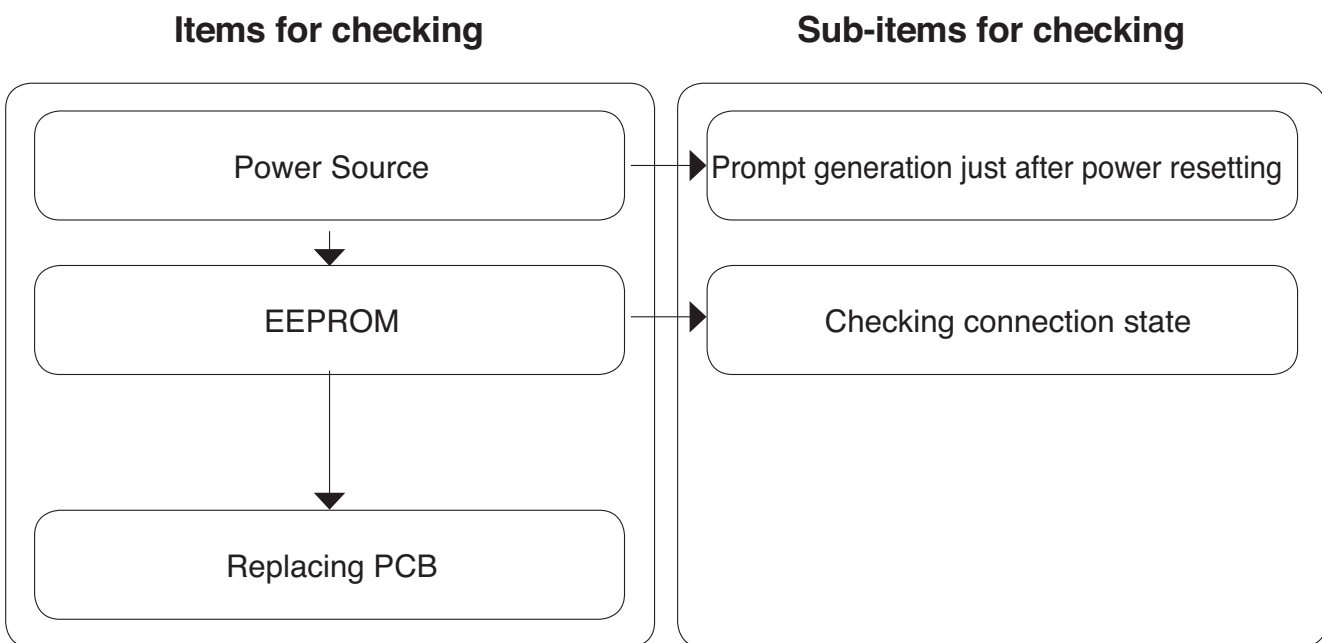
## 6.7 Troubleshooting Outdoor Error

### CH 60 (EEPROM Fault)

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

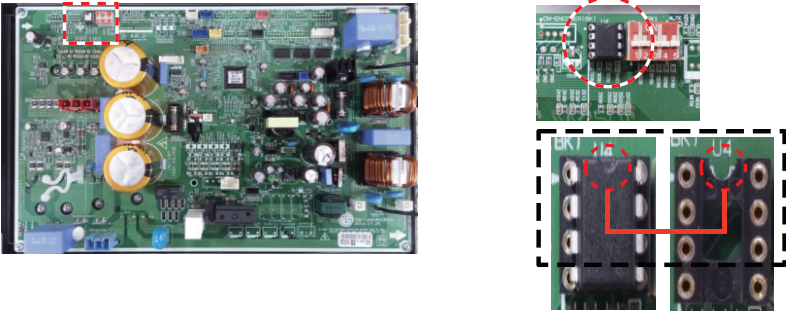
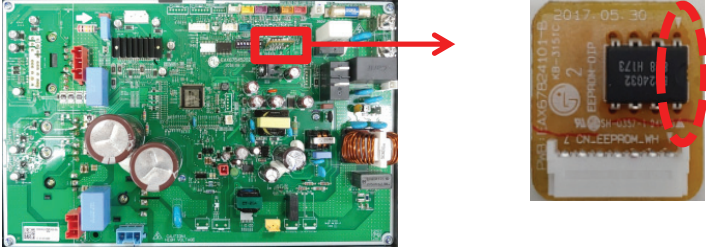
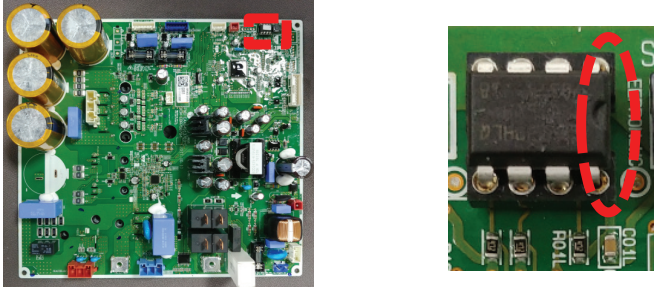
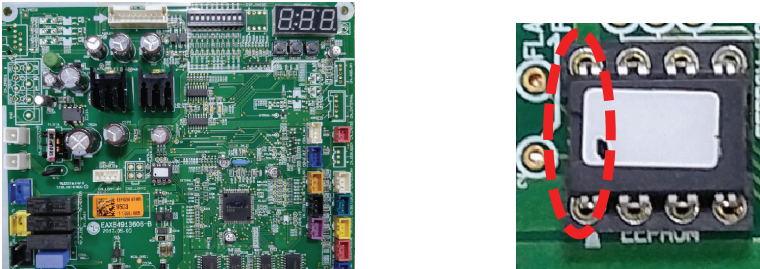
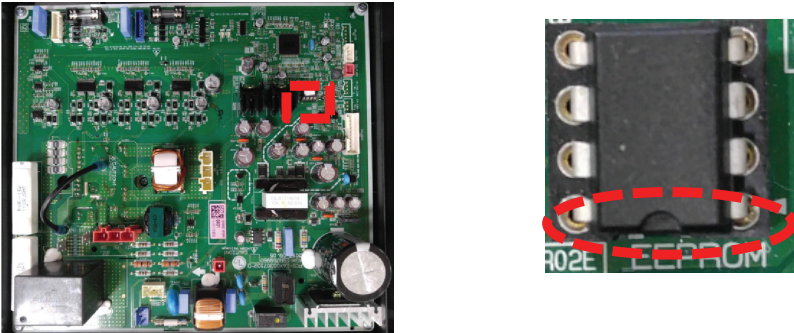
Items	Contents
Purpose	Prevention of application of wrong cycle data
Condition for Generation	Judgment of the error caused by noise and the fault of EEPROM connection

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



### ■ 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.

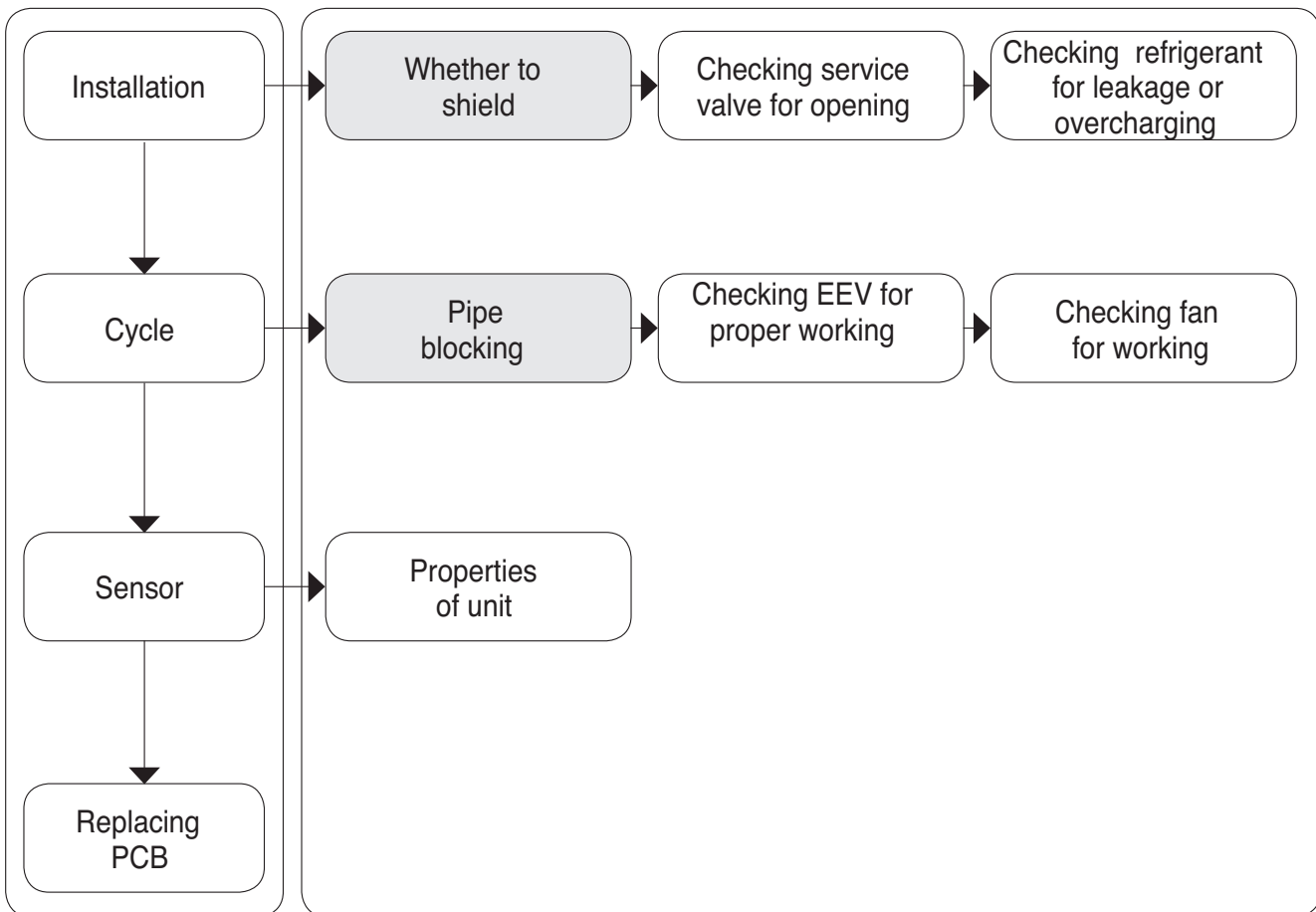
Division	EEPROM Position
4 kW	 <p>The main PCB image shows the EEPROM location highlighted with a red dashed box. The component image shows the EEPROM chip with a red dashed box around it. Below the component image is the label "EEPROM".</p>
4.5 kW	<p>[Inverter PCBA]</p>  <p>The Inverter PCBA image shows the EEPROM location highlighted with a red dashed box. The EEPROM PCBA image shows the EEPROM chip with a red dashed box around it.</p>
6 kW Inv.	 <p>The main PCB image shows the EEPROM location highlighted with a red dashed box. The component image shows the EEPROM chip with a red dashed box around it.</p>
6/7 kW Main	 <p>The main PCB image shows the EEPROM location highlighted with a red dashed box. The component image shows the EEPROM chip with a red dashed box around it.</p>
7 kW Inv.	 <p>The main PCB image shows the EEPROM location highlighted with a red dashed box. The component image shows the EEPROM chip with a red dashed box around it.</p>

## 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.

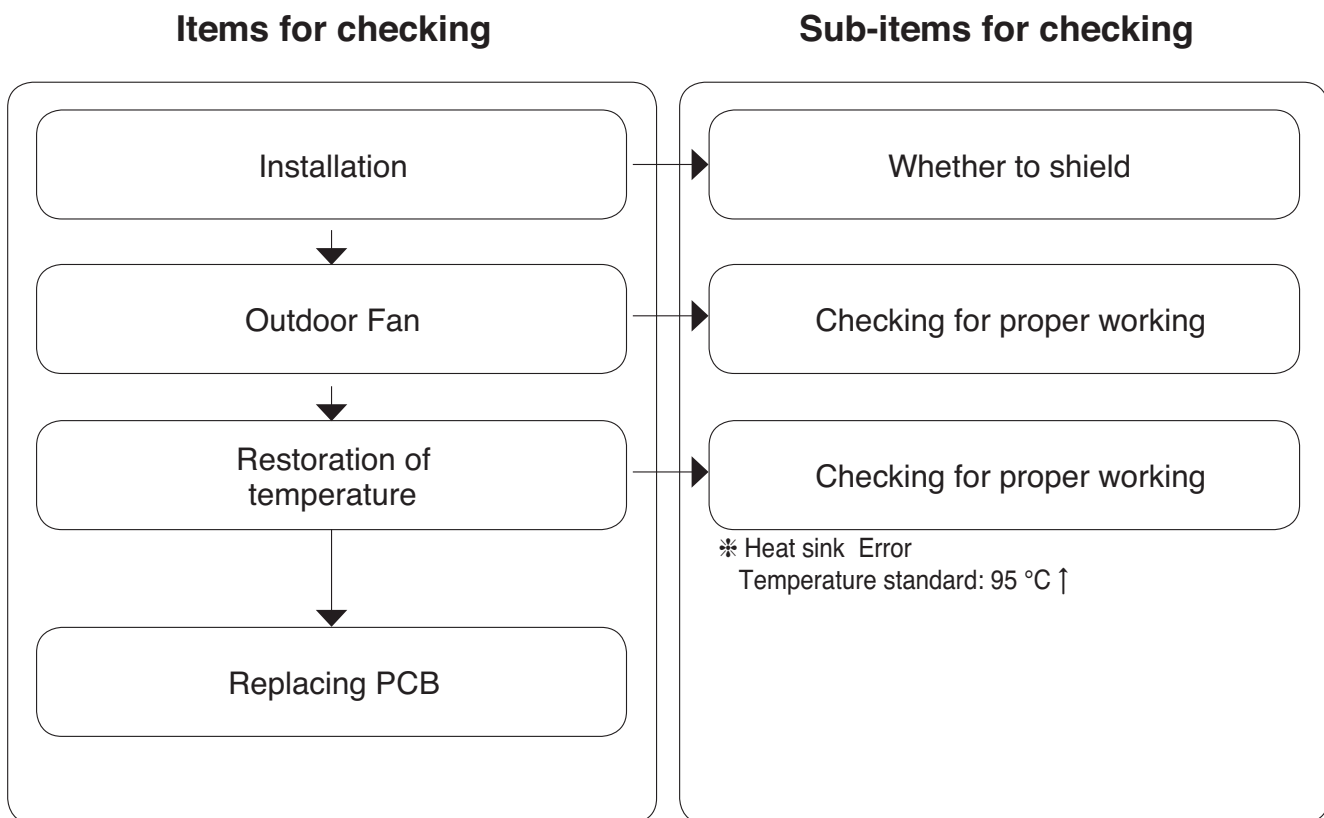


## 6.7 Troubleshooting Outdoor Error

### 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.

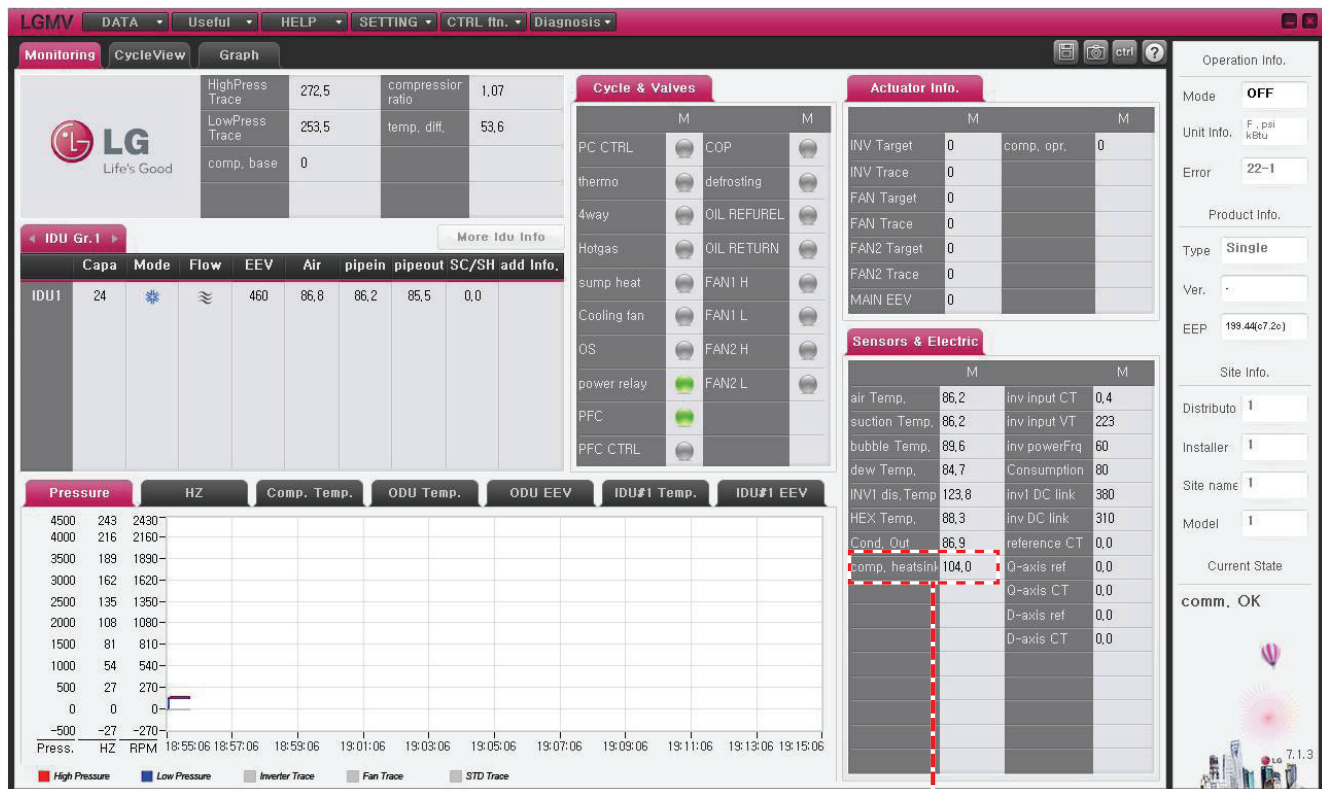
Resetting power source: Wait for 3 minutes after turning the power of the product off.



## 6.7 Troubleshooting Outdoor Error

### CH 62 (Heat sink High Error)

#### Check LGMV for CH 62



comp. heatsink 104,0

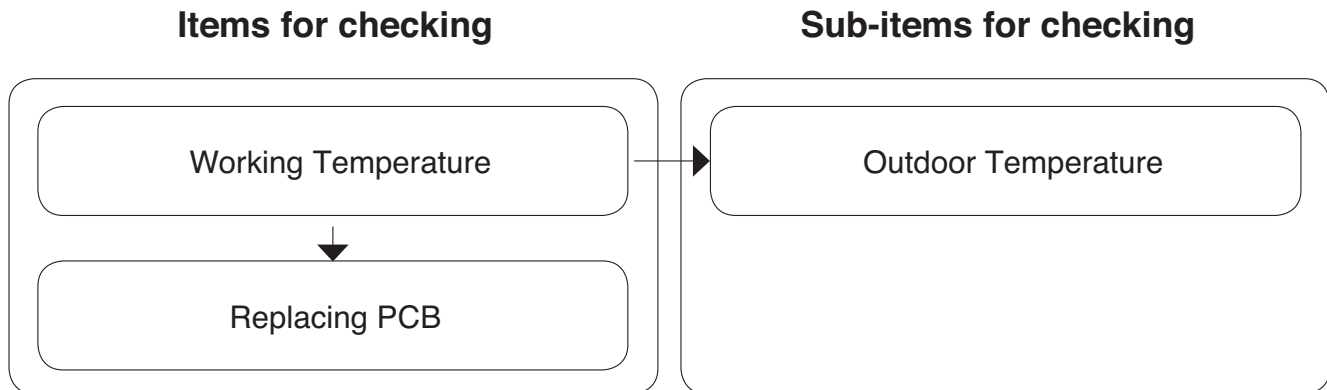
Heatsink High NG Temperature level

Controller	Temperature level
4 kW ↓	95 °C ↑
4.5 kW	95 °C ↑
6 kW	85 °C ↑
7 kW	125 °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 $\leq -40\text{ }^{\circ}\text{C}$ or $\geq 200\text{ }^{\circ}\text{C}$ .



### Environmental factor checking method

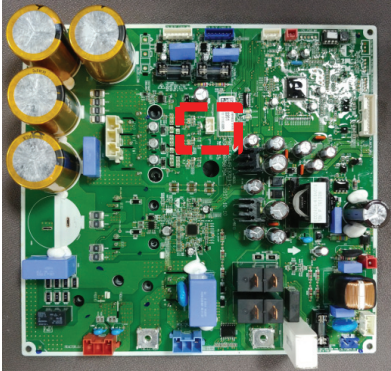
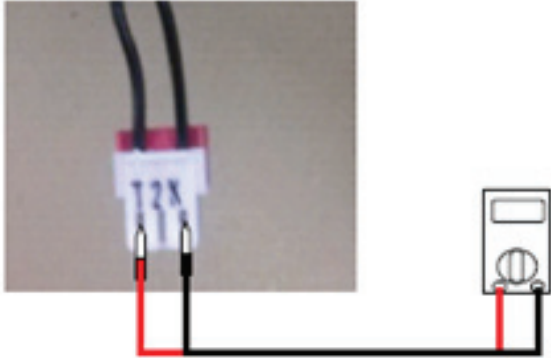
- 1) The products works when outdoor temperature is  $\leq -20\text{ }^{\circ}\text{C}$ .
- 2) Generation of CH65 case 10 minutes after the operation of the product



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  $25\text{ }^{\circ}\text{C}$ ,  $10\text{ k}\Omega \pm 10\%$ )

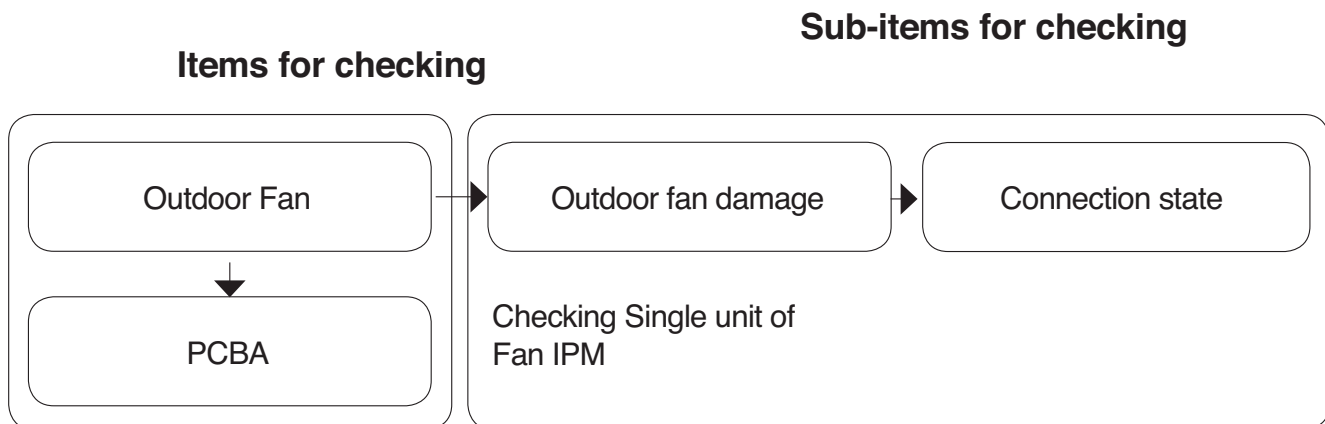
Division	Heat sink Tempe Sensor Point
6 kW	<div data-bbox="363 225 753 597"></div> <div data-bbox="847 234 1396 593"></div>

Items	Contents
Purpose	Detection of no proper operation of the fan.
Condition for Generation	The fan is not operated at the rpm exceeding the standard.

## CH67 Cause of Generation

Classification	Causes in Detail
Fan	Fan motor damage and fan connection fault
PCB Assembly	Damage of fan motor driving circuit

## Trouble Checking Flow



## Cautions

- 1) Both the fan and PCB may be damaged when the fan connector is mounted or removed in the state that the power is supplied.
- 2) Both the fan and PCB may be damaged when the fan connector is inserted in reverse direction..
- 3) If fan motor fault is identified, PCB should be also replaced in consideration of possible damage of PCB.

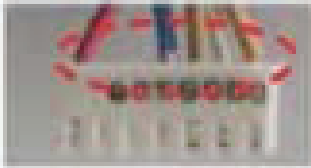


## 6.7 Troubleshooting Outdoor Error

### CH 67 (Fan Lock)

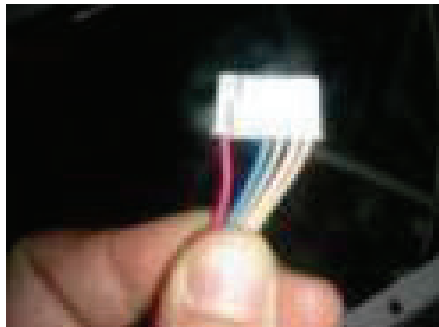
#### Checking Fan motor

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.

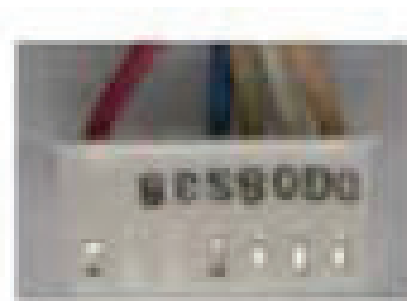


4. Check the Motor. Refer to the below.

#### ■ How to check the outdoor fan motor of BLDC



- Checking wire terminals for possible short



① ④ ⑤ ⑥ ⑦

Tester		Normal resistance (±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

## 6.7 Troubleshooting Outdoor Error

### CH 67 (Fan Lock)

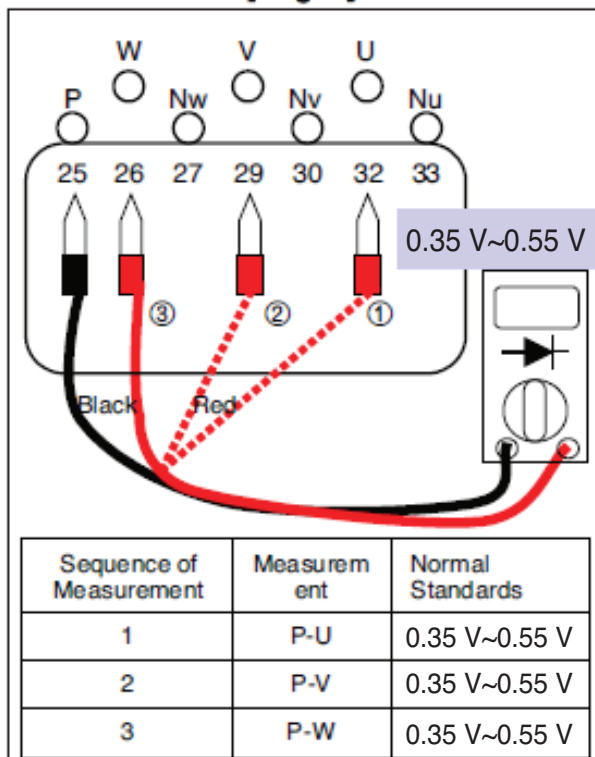
#### Fan IPM Check

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

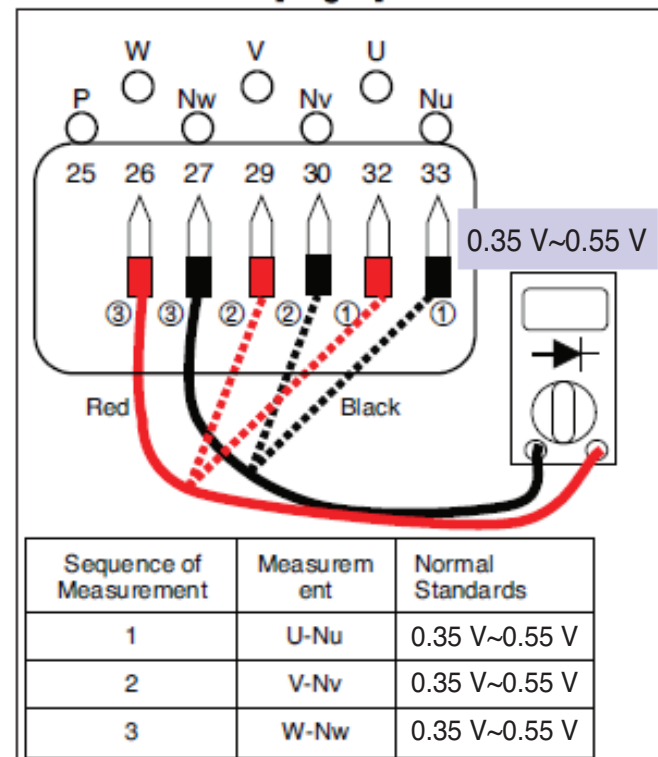
#### ■ How to check Fan IPM IGBT (Diode Mode)

1. Remove the connector from PCB.
2. Set the Multi-Tester as Diode Voltage Measurement Mode. (→|←)
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.

[ Fig.1 ]



[ Fig.2 ]

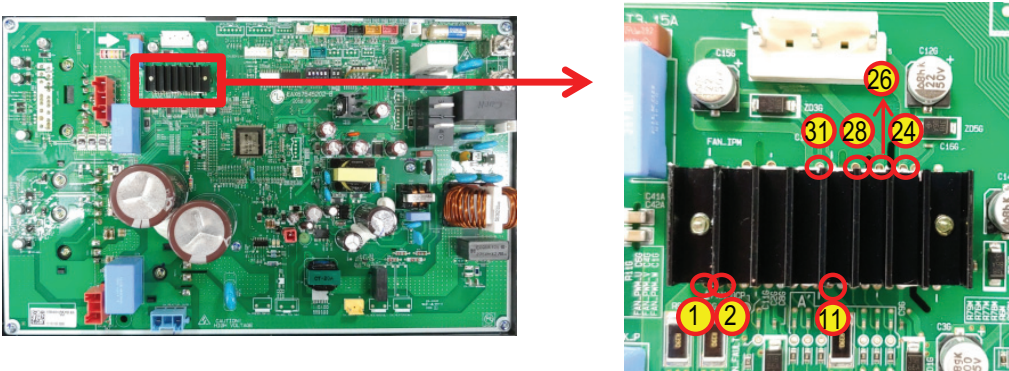
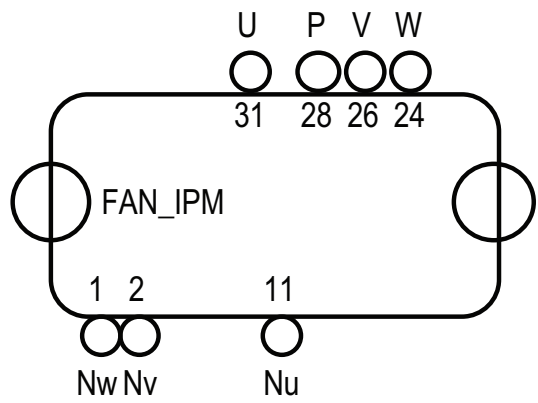


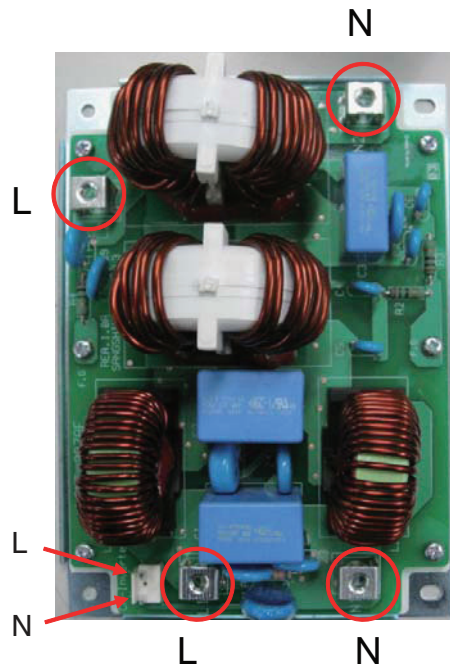
## 5. Trouble Shooting

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

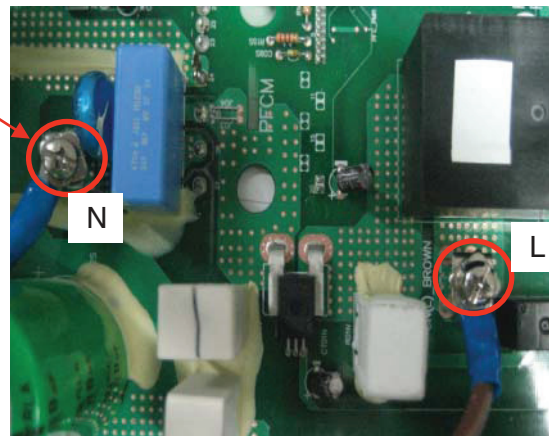
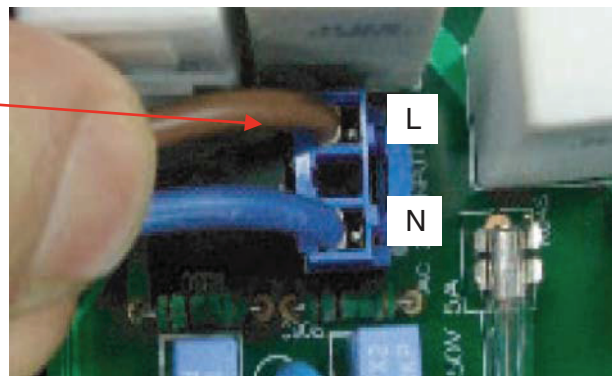
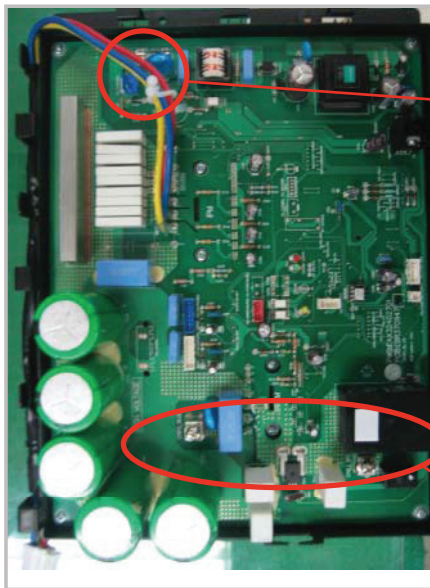
Step	Flow of Inspection
1	Turn the power off (wait until the outdoor device LED is turned off)
2	Remove Fan wires.
3	Measure the voltage as shown in the figure.
4	Check the voltage for being in the range of 0.35 V ~ 0.55 V
5	Judge Fan IPM Pins for short.

### ■ Fan IPM Check Point

Division	Fan IPM Check Point
4.5 kW	 



< Noise Filter wiring Check Point >



< Input Power Source Check Point >

< Inverter PCB wiring Check Point >

**Part 6    Service Order**

**1. PCB Service Order .....175**



## 1. PCB Service Order

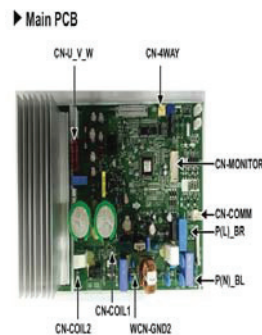
► A2UW14GFA2 / A2UW16GFA2 / A3UW18GFA2 / A3UW21GFA2

1



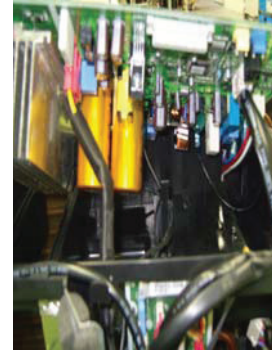
Remove Top Cover and Control Box Cover

4



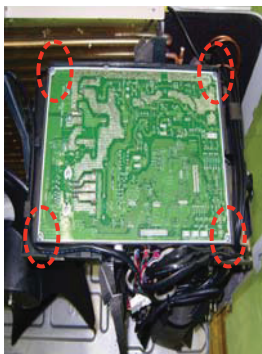
Take Terminals from PCB with a tool

7



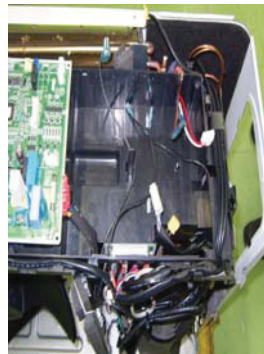
Hang wires up on the Rib from Case and Insert PCB into Control Box

2



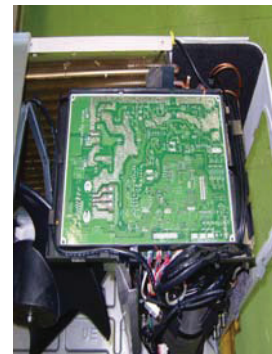
Remove PCB Screws (4ea)

5



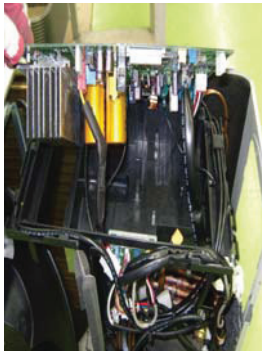
Replace New PCB

8



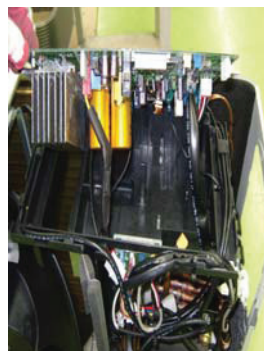
Tighten PCB Screws (4ea)

3



Raise PCB and take terminals from PCB

6



Re-wire terminal

9



Assemble C/Box and Top Cover into a complete whole



P/NO : MFL36552521