LG
Life's Good

SERVICE MANUAL(R410A)

AIR CONDITIONER

Please read this manual carefully before operating your set and retain it for future reference.

MULTI V S

P/NO : MFL42395722

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Safety Precautions

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

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

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

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

	**Be sure not to do.**
	**Be sure to follow the instruction.**

⚠WARNING

■ Installation

Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit.

- If the power source capacity is inadequate or electric work is performed improperly, electric shock or fire may result.

Ask the dealer or an authorized technician to install the air conditioner.

- Improper installation by the user may result in water leakage, electric shock, or fire.

Always ground the product.

- There is risk of fire or electric shock.

Always intstall a dedicated circuit and breaker.

- Improper wiring or installation may cause fire or electric shock.

For re-installation of the installed product, always contact a dealer or an Authorized Service Center.

- There is risk of fire, electric shock, explosion, or injury.

Do not install, remove, or re-install the unit by yourself (customer).

- There is risk of fire, electric shock, explosion, or injury.

Do not store or use flammable gas or combustibles near the air conditioner.

• There is risk of fire or failure of product.

Use the correctly rated breaker or fuse.

• There is risk of fire or electric shock.

Prepare for strong wind or earthquake and install the unit at the specified place.

• Improper installation may cause the unit to topple and result in injury.

Do not install the product on a defective installation stand.

• It may cause injury, accident, or damage to the product.

When installing and moving the air conditioner to another site, do not charge it with a different refrigerant from the refrigerant specified on the unit.

• If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.

Do not reconstruct to change the settings of the protection devices.

• If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by LGE are used, fire or explosion may result.

Ventilate before operating air conditioner when gas leaked out.

• It may cause explosion, fire, and burn.

Securely install the cover of control box and the panel.

• If the cover and panel are not installed securely, dust or water may enter the outdoor unit and fire or electric shock may result.

If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit when the refrigerant leaks.

• Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, harzards due to lack of oxygen in the
room could result

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 gas es. Otherwise, it may cause fire or explosion.

• There is the risk of death, injury, fire or explosion.

■ Operation

Do not damage or use an unspecified power cable.

- There is risk of fire, electric shock, explosion, or injury.

Use a dedicated power cable for this appliance.

- There is risk of fire or electrical shock.

Be cautious that water could not enter the product.

- There is risk of fire, electric shock, or product damage.

Do not touch the power switch with wet hands.

- There is risk of fire, electric shock, explosion, or injury.

When the product is soaked (flooded or submerged), contact an Authorized Service Center.

- There is risk of fire or electric shock.

Be cautious not to touch the sharp edges when installing.

- It may cause injury.

Take care to ensure that nobody could step on or fall onto the outdoor unit.

- This could result in personal injury and product damage.

Do not open the inlet grille of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

- There is risk of physical injury, electric shock, or product failure.

⚠CAUTION

■ Installation

Always check for gas (refrigerant) leakage after installation or repair of product.

- Low refrigerant levels may cause failure of product.

Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

- It may cause a problem for your neighbors.

Keep level even when installing the product.

- To avoid vibration or water leakage.

Do not install the unit where combustible gas may leak.

- If the gas leaks and accumulates around the unit, an explosion may result.

Use power cables of sufficient current carrying capacity and rating.

- Cables that are too small may leak, generate heat, and cause a fire.

Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigeration system.

- There is risk of damage or loss of property.

Keep the unit away from children. The heat exchanger is very sharp.

- It can cause the injury, such as cutting the finger. Also the damaged fin may result in degradation of capacity.

When installting the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.

- The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.

Do not install the product where it is exposed to sea wind (salt spray) directly.

- It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

■ Operation

Do not use the air conditioner in special environments.

- Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.

Do not block the inlet or outlet.

- It may cause failure of appliance or accident.

Make the connections securely so that the outside force of the cable may not be applied to the terminals.

- Inadequate connection and fastening may generate heat and cause a fire.

Be sure the installation area does not deteriorate with age.

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, or personal injury.

Install and insulate the drain hose to ensure that water is drained away properly based on the installation manual.

- A bad connection may cause water leakage.

Be very careful about product transportation.

- Only one person should not carry the product if it weighs more than 20 kg.
- Some products use PP bands for packaging. Do not use any PP bands for a means of transportation. It is dangerous.
- Do not touch the heat exchanger fins. Doing so may cut your fingers.
- When transporting the outdoor unit, suspending it at the specified positions on the unit base. Also support the outdoor unit at four points so that it cannot slip sideways.

Safely dispose of the packing materials.

- Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
- Tear apart and throw away plastic packaging bags so that children may not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

Turn on the power at least 6 hours before starting operation.

- Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.

Do not touch any of the refrigerant piping during and after operation.

- It can cause a burn or frostbite.

Do not operate the air conditioner with the panels or guards removed.

- Rotating, hot, or high-voltage parts can cause injuries.

Do not directly turn off the main power switch after stopping operation.

- Wait at least 5 minutes before turning off the main power switch. Otherwise it may result in water leakage or other problems.

Auto-addressing should be done in condition of connecting the power of all indoor and outdoour units. Auto-addressing should also be done in case of changing the indoor unit PCB.

Use a firm stool or ladder when cleaning or maintaining the air conditioner.

- Be careful and avoid personal injury.

Do not insert hands or other objects through the air inlet or outlet while the air conditioner is powered on.

- There are sharp and moving parts that could cause personal injury.

Part 1
General Information

1. Model Names

1.1 Indoor Unit

Category		Chassis Name	Capacity(Btu/h(kW))														
			5k (1.6)	7k (2.2)	9k (2.8)	12k (3.6)	15k (4.5)	18k (5.6)	21k (6.2)	24k (7.1)	28k (8.2)	36k (10.6)	42k (12.3)	48k (14.1)	54k (15.8)	76k (22.4)	96k (28.0)
Wall Mounted	General	S5						O		O							
	Libero	SB		O	O	O	O										
		SC						O		O							
ART COOL	Mirror	SE		O	O	O	O										
		S8						O		O							
	Gallery	SF		O	O	O											
Ceiling Cassette	1 Way	TU		O	O	O											
		TT						O		O							
	2 Way	TL						O		O							
	4 Way	TR	O	O	O	O											
		TQ					O	O									
		TP								O	O						
		TN										O					
		TM											O	O			
Ceiling Concealed Duct	High Static	BH		O	O	O	O	O		O							
		BG									O	O	O				
		BR												O	O		
		B8														O	O
	Low Static	L1	O	O	O												
		L2				O	O	O									
		L3							O	O							
	Built In (Low Static)	B3		O	O	O	O										
		B4						O		O							
Ceiling & Floor		VE			O	O											
Ceiling Suspended		VJ						O		O							
		VK										O					
		VL												O			
Floor Standing	With Case	CE		O	O	O	O										
		CF						O		O							
	Without Case	CE		O	O	O	O										
		CF						O		O							
Console		QA		O	O	O	O										
Fresh Air Intake Unit		BR												O			
		B8														O	O
eco V DX		ZG				O		O		O							

❉ In matters of combination with Outdoor unit system, refer the PDB of that outdoor units.
❉ *ART COOL- SE/S8(* R:Mirror, V:Silver), SF(* E:Red, V:Silver, G:Gold , 1: Kiss (Photo changeable))
*Wall Mounted- A: Basic, L:Plasma, *Ceiling Cassette- A: Basic, C:Plasma

1.2 Outdoor Unit

Power Supply	4HP	5HP	6HP
1Φ, 220-240V, 50Hz	ARUN040GSS0	ARUN050GSS0	ARUN060GSS0
1Φ, 220V, 60Hz			

Power Supply	4HP	5HP	6HP
3Φ, 380-415V, 50Hz	ARUN040LSS0	ARUN050LSS0	ARUN060LSS0
3Φ, 380V, 60Hz			

Power Supply	8HP	10HP	12HP
3 Φ, 380-415 V, 50 Hz	ARUN080LSS0	ARUN100LSS0	ARUN120LSS0
3 Φ, 380 V, 60 Hz			

Power Supply	14HP
3 Φ, 380-415 V, 50 Hz	ARUV140LSS0
3 Φ, 380 V, 60 Hz	

2. External Appearance

2.1 Indoor Unit

Ceiling Cassette- 1Way

ARNU07GTU*2
ARNU09GTU*2
ARNU12GTU*2

ARNU18GTT*2
ARNU24GTT*2

* A:Basic, C:Plasma

Ceiling Cassette- 4Way

ARNU05GTR*2
ARNU07GTR*2
ARNU09GTR*2
ARNU12GTR*2
ARNU15GTQ*2
ARNU18GTQ*2
ARNU24GTP*2
ARNU28GTP*2
ARNU36GTN*2
ARNU42GTM*2
ARNU48GTM*2

* A:Basic, C:Plasma

Ceiling Concealed Duct - Low Static

ARNU05GL1G2
ARNU07GL1G2
ARNU09GL1G2
ARNU12GL2G2
ARNU15GL2G2
ARNU18GL2G2
ARNU21GL3G2
ARNU24GL3G2

Ceiling Concealed Duct – Built-in (Low Static)

ARNU07GB3G2
ARNU09GB3G2
ARNU12GB3G2
ARNU15GB3G2
ARNU18GB4G2
ARNU24GB4G2

ART COOL Mirror

ARNU07GSE*2
ARNU09GSE*2
ARNU12GSE*2
ARNU15GSE*2
ARNU18GS8*2
ARNU24GS8*2

* R:Mirror, V:Silver

Ceiling & Floor

ARNU09GVEA2
ARNU12GVEA2

Ceiling Suspended

URNU18GVJA2 URNU36GVKA2
URNU24GVJA2 URNU48GVLA2

Ceiling Cassette -2Way

ARNU18GTL*2
ARNU24GTL*2

* A:Basic, C:Plasma

Ceiling Concealed Duct - High Static

ARNU07GBHA2
ARNU09GBHA2
ARNU12GBHA2
ARNU15GBHA2
ARNU18GBHA2
ARNU24GBHA2
ARNU28GBGA2
ARNU36GBGA2
ARNU42GBGA2
ARNU48GBRA2
ARNU54GBRA2
ARNU76GB8A2
ARNU96GB8A2

Wall mounted (Libero)

ARNU07GSB*2
ARNU09GSB*2
ARNU12GSB*2
ARNU15GSB*2
ARNU18GSC*2
ARNU24GSC*2

* A:Basic, L:Plasma

ART COOL Gallery

ARNU07GSF*2
ARNU09GSF*2
ARNU12GSF*2

* E:Red V:Silver
G:Gold 1: Kiss (Photo changeable)

Floor Standing

With case

ARNU07GCEA2
ARNU09GCEA2
ARNU12GCEA2
ARNU15GCEA2
ARNU18GCFA2
ARNU24GCFA2

Without case

ARNU07GCEU2
ARNU09GCEU2
ARNU12GCEU2
ARNU15GCEU2
ARNU18GCFU2
ARNU24GCFU2

Console

ARNU07GQAA2
ARNU09GQAA2
ARNU12GQAA2
ARNU15GQAA2

Fresh Air Intake Unit

ARNU48GBRZ2
ARNU76GB8Z2
ARNU96GB8Z2

Eco V DX

LZ-H050GXH0 LZ-H050GXN0
LZ-H080GXH0 LZ-H080GXN0
LZ-H100GXH0 LZ-H100GXN0

*H:with humidifier, N:without humidifier

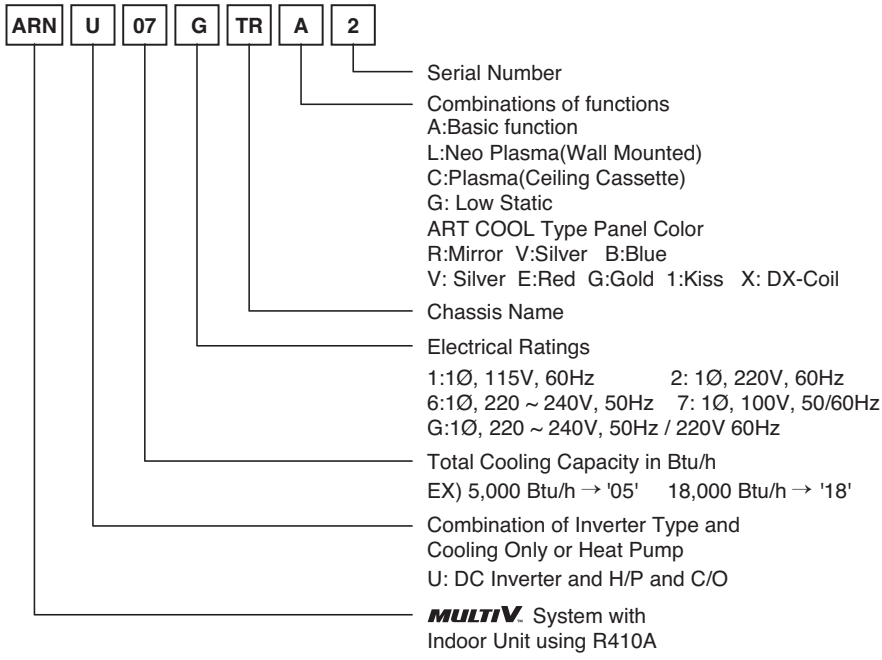
❊ In matters of combination with Outdoor unit system, refer the PDB of that outdoor units.

2.2 Outdoor Unit

CHASSIS	Model Name	External Appearance
U4	ARUN040GSS0	
U3	ARUN080LSS0 ARUN060LSS0 ARUN050LSS0 ARUN040LSS0 ARUN060GSS0 ARUN050GSS0	
U7	ARUN100LSS0 ARUN120LSS0 ARUV140LSS0	

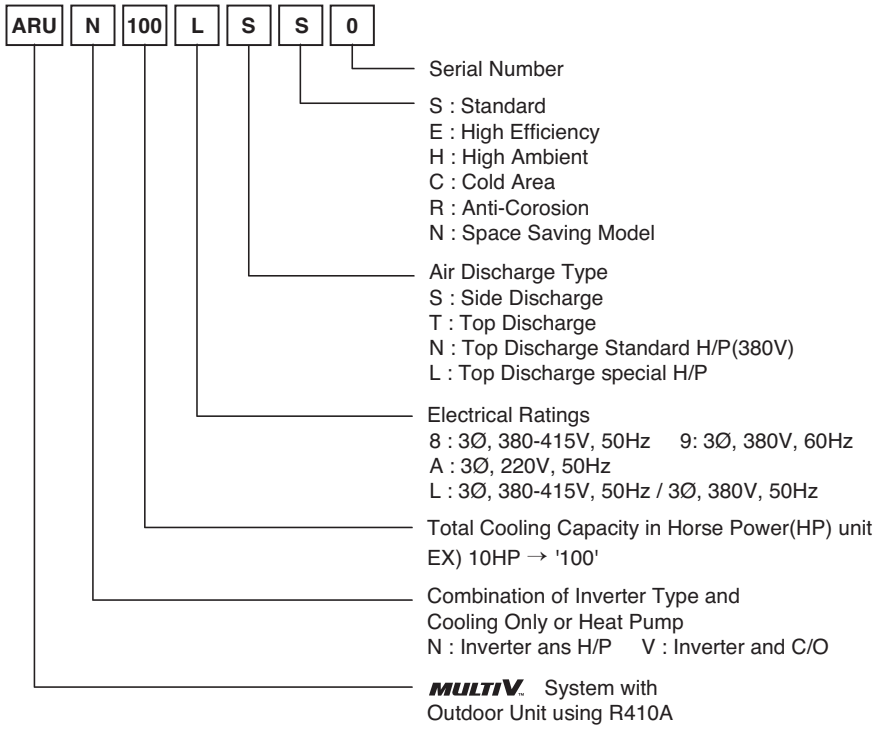
3. Nomenclature

3.1 Indoor Unit



※ Heat recovery ventilator refer to the DX-Coil manual

3.2 Outdoor Unit



Part 2
Outdoor Units

ARU* Series

Function

1. Basic control

1.1 Normal operation

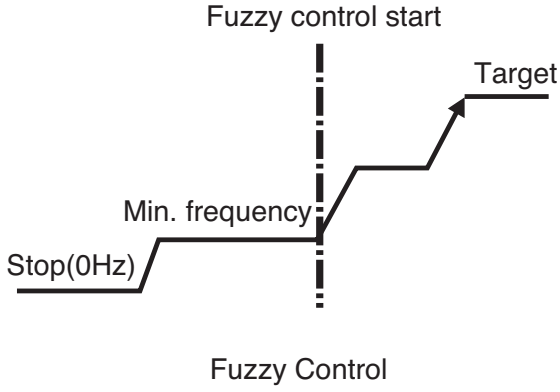
Actuator	Cooling operation	Heating operation	Stop state
Compressor	Fuzzy control	Fuzzy control	Stop
Fan	Fuzzy control	Fuzzy control	Stop
Main EEV	Full open	Fuzzy control	Close
4 way valve	OFF	ON	1 hour after Heating stop & outdoor temp. > 30°C → OFF
Subcooling EEV	Fuzzy control	Fuzzy control	Close
Indoor Unit EEV	Superheat fuzzy control	Subcooling fuzzy control	Close

Note : Heating operation is not functional at an outdoor air temperature of 27°C or more.
Cooling operation is not functional at an outdoor air temperature of 2°C or less with indoor unit combination of 10% or less

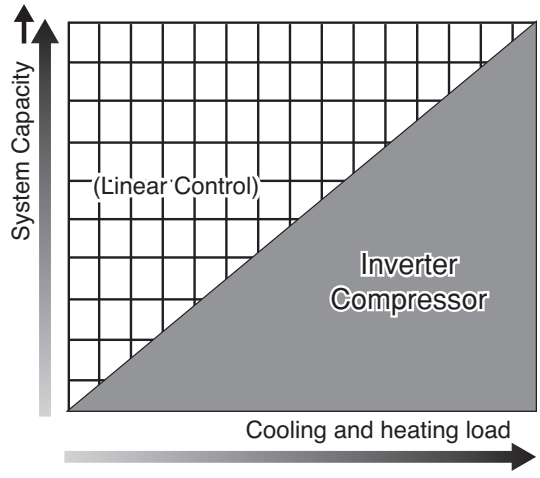
1.2 Compressor control

Fuzzy control : Maintain evaporating temperature(Te) to be constant on cooling mode and condensing temperature(Tc) on heating mode by Fuzzy control to ensure the stable system performance.
(Tc:47 ~51°C, Te:2 ~ 5°C)
(1) Cooling mode
Te can be set various step at installation mode.
(2) Heating mode
Tc can be set various step at installation mode.

Note: By setting dip switch, Te and Tc are decided simultaneously.



Fuzzy Control



Inverter linear control as cooling and heating load increasing

1.3 EEV control

(1) Main EEV control
Main EEV operates with fuzzy control rules to keep the degree of super Heat(Superheat) (about 3°C)at the evaporator outlet stable during heating mode
The degree of Superheat = Tsuction - Tevaporation
Tsuction : temperature at suction pipe sensor(°C)
Tevaporation : evaporation temperature equivalent to low pressure(°C)

(2) Subcooling EEV control(about 15°C)
Subcooling EEV works with fuzzy rules to keep the degree of Subcool at the outlet of subcooler during cooling mode
The degree of Subcool = Tcondensation - Tliquid
Tliquid : temperature at outlet of subcooler(°C)
Tcondensation : condensation temperature equivalent to high pressure(°C)

(3) Avoiding excessive high discharge temperature : when main EEV opens some given opening and discharge temperature is above 85°C in heating operation, subcooling EEV may control the "subcooling out temperature-evaporating temperature" to be some given difference.

2. Special control

2.1 Oil return control

2.1.1 Oil return control on cooling mode

Oil return operation recovers Oil level 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
Inverter compressor	30Hz	Setting Value	30Hz
Fan	Normal control	Normal control	Normal control
Main EEV	Max. pulse	Max. pulse	Max. pulse
Subcooling EEV	Min. pulse	Min. pulse	Min. pulse
4way valve	OFF	OFF	OFF
Hot gas bypass valve	Normal control	Normal control	Normal control

Indoor Unit

Component	Starting	Running	Ending
Fan	Normal control	Normal control	Normal control
Thermo on unit EEV	Normal control	Normal control	Normal control
Thermo off unit EEV	40 pulse	400 pulse	40 pulse
Oil return signal	OFF	ON	OFF

- Oil return operation time : 3 min for running step
- Starting condition : Every 8 hours operate
- Oil return process ends if compressor protection control starts

2.1.2 Oil return control on heating mode

Outdoor Unit

Component	Starting	Running	Ending
Inverter compressor	30Hz	Setting Value	40Hz
Fan	OFF	Normal control	OFF
Main EEV	300 pulse	Max. pulse	200 pulse
Subcooling EEV	Min. pulse	Min. pulse	Min. pulse
4way valve	ON	ON → OFF → ON	ON
Hot gas bypass valve	Normal control	Normal control	Normal control

Indoor Unit

Component	Starting	Running	Ending
Fan	Normal control	Normal control	Normal control
Thermo on unit EEV	Normal control	400~800 pulse	1200 → 600 → Normal Control
Thermo off unit EEV	60~100 pulse	400~800 pulse	1200 → 600 → 60~100 pulse

- Oil return operation time : 3 min for running step
- Starting condition:same as cooling mode
- Oil return process ends if compressor protection control starts

2.2 Defrost

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

Outdoor Unit

Component	Starting	Running	Ending
Inverter compressor	30Hz	Setting Value	40Hz
Fan	OFF	Normal control	OFF
Main EEV	300 pulse	Max. pulse	200 pulse
Subcooling EEV	Min. pulse	Min. pulse	Min. pulse
4way valve	ON	ON → OFF → ON	ON
Hot gas bypass valve	Normal control	Normal control	Normal control

Indoor Unit

Component	Starting	Running	Ending
Fan	Normal control	Normal control	Normal control
Thermo on unit EEV	Normal control	400~800 pulse	1200 → 600 → Normal Control
Thermo off unit EEV	60~100 pulse	400~800 pulse	1200 → 600 → 60~100 pulse

■ Ending condition

1) All heat exchanger pipe temperature are above setting temperature for 30 sec.
2) The running time of defrost operation is over 30% of the total heating time
3) If compressor protection control starts by high discharge temperature of compressor etc.

2.3 Stopping operation

2.3.1 Stopping operation on cooling mode

Component	Operation	Note
Inverter compressor	0Hz	-
Fan	Stop	-
Main EEV	Min. pulse	-
Subcooling EEV	Min. pulse	-
4way valve	OFF	-
Hot gas bypass valve	OFF	After 15 min. (Before 15 min. : ON)

2.3.2 Stopping operation on heating mode

Component	Operation	Note
Inverter compressor	0Hz	-
Fan	Stop	-
Main EEV	Min. pulse	-
Subcooling EEV	Min. pulse	-
4way valve	ON ⟶ OFF	1 hour after stop & outdoor temp. > 30˚C ➡ OFF
Hot gas bypass valve	OFF	After 15 min. (Before 15 min. : ON)

3. Protection control

3.1 Pressure protection control

3.1.1 Pressure control on cooling mode

■ **High pressure control**

Pressure Range	Compressor
Pd ≥ 4000 kPa	Stop
Pd ≥ 3873 kPa	-5Hz/10sec
Pd ≥ 3742	Frequency holding
Pd ≥ 3644	+2Hz or less/10sec
Pd < 3644	Normal control

Pressure Range	Fan
Pd ≥ 4000 kPa	Stop
Pd ≥ 3775 kPa	+50RPM/10sec
Pd ≥ 3578	RPM holding
Pd < 3578	Normal control

■ **Low pressure control**

Pressure Range	Compressor	Fan
Ps ≤ 98 kPa, 1 minute later operation	Stop	
Ps ≤ 124 kPa	-15Hz/10sec	-100RPM/10sec

❉ Frequency holding : frequency (or RPM) is not increasing (can decrease)

3.1.2 Pressure control on heating mode

■ **High pressure control**

Pressure Range	Compressor	Fan
Pd > 3846 kPa	Stop	
Pd ≥ 3513 kPa	-15Hz/10sec	-50RPM/10sec
Pd ≥ 3317 kPa	Frequency holding	-50RPM/10sec
Pd ≥ 3115 kPa	Frequency holding	RPM holding
Pd < 3115 kPa	Normal control	

■ **Low pressure control**

Pressure Range	Compressor	Fan
Ps ≤ 98 kPa, 1 minute later operation	Stop	
Ps ≤ 124 kPa	-15Hz/10sec	+100RPM/10sec
Ps > 124 kPa	Frequency holding	+100RPM/10sec
Ps ≥ 137 kPa	+2Hz or less/10sec	+100RPM/10sec
Ps ≥ 190 kPa	Normal control	

❉ Frequency holding : frequency (or RPM) is not increasing (can decrease).

3.2 Discharge temperature control

■ **Outdoor unit control**

Temperature Range	Compressor	Sub cooling EEV	IDU EEV
Tdis ≥ 115 °C	OFF	Min. pulse	Min. pulse
Tdis ≥ 110 °C	-5Hz/10sec	SC_SH decrease control	SH decrease control
Tdis ≥ 108 °C	-5Hz/30sec		
108 °C > Tdis ≥ 105 °C	no increase		
105 °C > Tdis ≥ 100 °C	+3Hz or less		
Tdis < 100 °C	Normal control		

SC : Sub Cooling, SH : Super Heating

3.3 Inverter protection control

■ **ARUV140LSS0**

- Cooling mode

	Normal Operation	Frequency Down	System Stop
AC input Current	21A or less	22A or less	24A or less
Compressor Current	32A or less	33A or less	37A or less

■ **ARUN120LSS0**

- Cooling mode

	Normal Operation	Frequency Down	System Stop
AC input Current	23A or less	24A or less	28A or less
Compressor Current	30A or less	31A or less	35A or less

- Heating mode

	Normal Operatiion	Frequency Down	System Stop
AC input Current	25A or less	26A or less	28A or less
Compressor Current	30A or less	31A or less	35A or less

■ **ARUN100LSS0**

- Cooling mode

	Normal Operation	Frequency Down	System Stop
AC input Current	19A or less	20A or more	24A or more
Compressor Current	30A or less	31A or more	35A or more

- Heating mode

	Normal Operatiion	Frequency Down	System Stop
AC input Current	21A or less	22A or more	24A or more
Compressor Current	30A or less	31A or more	35A or more

■ **ARUN080LSS0**

- Cooling & Heating mode

	Normal Operation	Frequency Down	System Stop
AC input Current	17A or less	18A or more	20A or more
Compressor Current	23A or less	24A or more	30A or more

■ **ARUN040LSS0/ARIUN050LSS0/ARUN060LSS0**

- Cooling mode

	Normal Operation	Frequency Down	System Stop
AC input Current	25A or less	27A or less	29A or less
Compressor Current	13A or less	14A or less	20A or less

- Heating mode

	Normal Operatiion	Frequency Down	System Stop
AC input Current	26A or less	27A or less	29A or less
Compressor Current	13A or less	14A or less	20A or less

■ **ARUN040GSS0/ARIUN050GSS0/ARUN060GSS0**

- Cooling & Heating mode

	Normal Operation	Frequency Down	System Stop
AC input Current	14A or less	15A or less	17A or less
Compressor Current	15A or less	16A or less	20A or less

3.4 Phase detection

■ If the power lines are connected incorrectly the product will not work and displays error like below.
Case 1) 1 or more phase lines are omitting (disconnected)
Case 2) Neutral (N) line connected wrongly to any phase line

Case	Terminal block				Error No.
	R	S	T	N	
Missed Phase	X				50
		X			
			X		05
				X	50 (when Fan Motor operating)

3.5 Pressure switch

- Main has pressure sensing switch in series between compressor and power relay.
- The state of pressure sensing switch is normally on. It has small electric current from 220V AC. Never touch the connecting terminal with hand nor short two wires directly.

4. Other control

4.1 Initial setup

There are 4 initial setup steps before running.
All DIP switch setting must be completed before initial setup.

1) Step 1 : factory setting value display
Factory setting value is displayed in 7 segment on PCB for 24sec.
All dip switches must be set properly before step 1.

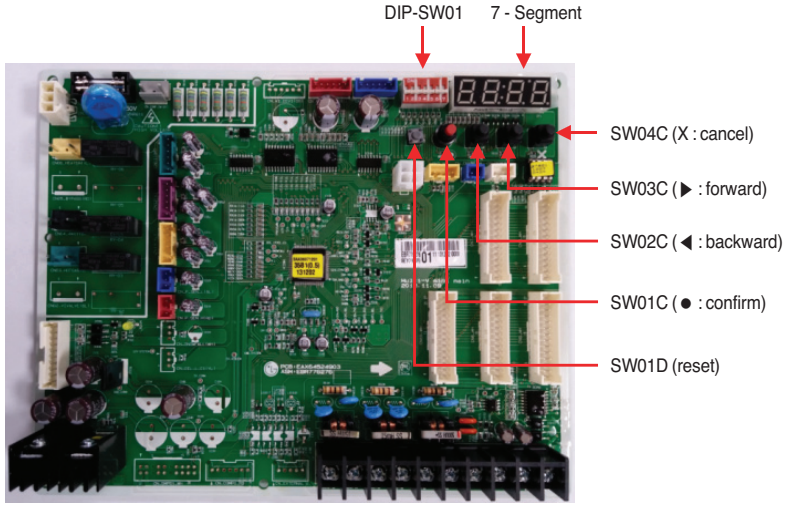
Power is on		
Master model code is displayed (3sec)		(In case of 4HP : 04) (In case of 5HP : 05) (In case of 6HP : 06) (In case of 8HP : 08)
Blank(6sec)		
Total capacity including sub units is displayed (2sec)		
Heat pump : Display 2 is default value		(In case of Cooling Only : 1)
Power type		
Model type		

2) Step 2 : Communication check
   - If all model code is displayed in 7 segment communication between outdoor units is normal.
   - If 104* is displayed in 7-segment, check communication wires between outdoor units and Dip switch setting.

3) Step 3 : PCB error check
   - After 40 sec, error check begins.

4) Step 4 : Auto addressing of indoor units
   - Auto addressing begins when address(red) button in Main PCB is pressed for 6 sec.
   - During auto addressing, 7 segment on main PCB displays "88"
   - After auto addressing, the number of indoor units is displayed in 7 segment for 30 sec. The address of each indoor unit is displayed on each wired remote controller.

■ Main PCB



Push address(red) button for 3 sec.

Auto address starts

Auto address is in progress (max. 15 min.)

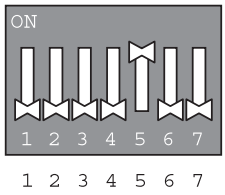
The number of indoor units is displayed for 30 sec.

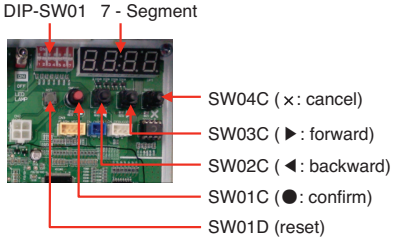
(16 indoor units found)

Auto address process is finished.
Every indoor unit displays its address on wired remote controller and the 7 segment of main PCB is off.

■ Setting the function

Select the mode/function/option/value using '▶', '◀' Button and confirm that using the '●' button after dip switch No.5 is turned on.





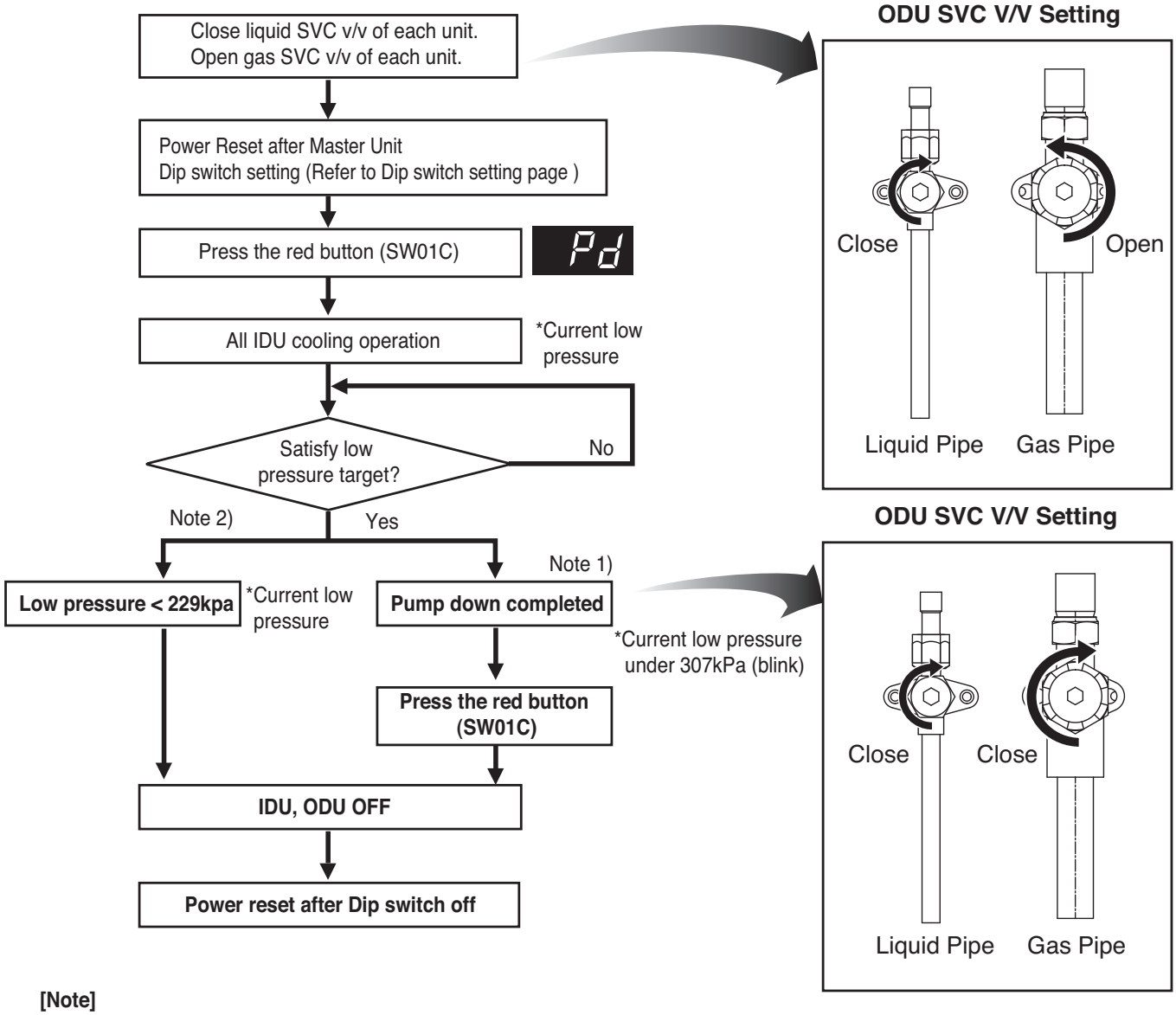
MODE		FUNCTION		OPTION			VALUE		ACTION		remarks
content	Display1	content	Display2	content		Display3	content	Display4	implement	Display5	
Installation	Func	Cool & Heat Selector	Fn 1	oFF	op1~op2	selected the option	-	-	change the set value	blank	save in EEPROM
		Static pressure compensation	Fn2	oFF	op1~op3	selected the option	-	-	change the set value	blank	save in EEPROM
		Night low noise	Fn3	oFF	op1~op15	selected the option	-	-	change the set value	blank	save in EEPROM
		ODU address	Fn5	-		-	0~254	set the value	change the set value	blank	save in EEPROM
		Snow removal & rapid defrost	Fnb	oFF	op1~op3	selected the option	-	-	change the set value	blank	save in EEPROM
		Target pressure adjusting	FnB	op1~op6		selected the option	-	-	change the set value	blank	save in EEPROM
SVC	Suc	Pump Down	SE 1	-		-	-	-	start operation	Pd	-
		Vacuum mode	SE3	-		-	-	-	start operation	uRcc	-
		Forced oil return	SE5	-		-	-	-	start operation	o 1	-
		Forced defrost	SEb	-		-	-	-	start operation	dEF	-
		Cycle data view	SE7	-		-	-	-	Show in segment	Show the each numerical value in process	-
		Refrigerant noise reduction mode	SEB	oFF	on	-	-	-	Change the set value	on oFF	save in EEPROM

* Functions save in EEPROM will be kept continuously, though the system power was reset.

4.2 Pump Down

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.



[Note]

If low pressure become under 307kPa (blink), close the gas SVC V/V of all ODU immediately.

If low pressure descends below 229 kPa, the system turns off automatically. Close the gas SVC V/V immediately.

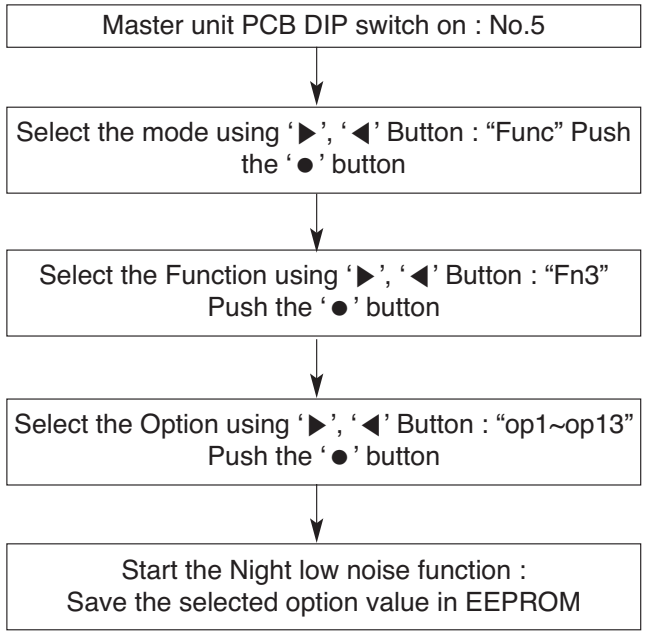
⚠ Caution

1.Use pump down function within guaranteed temperature range
   IDU : 20~32C
   ODU : 5~40C
2. Make certain that IDU doesn't run with thermo off mode during operation
3. Maximum operation time of pump down function is 30 min.
   (in case low pressure doesn't go down)

4.3 Night Low Noise Function

In cooling mode, this function makes the ODU fan operate at low RPM to reduce the fan noise of ODU at night which has low cooling load.

Night low noise function setting method



RPM / Time Settings

Step	Judgment Time(Hr)	Operation Time(Hr)
op1	8	9
op2	6.5	10.5
op3	5	12
op4	8	9
op5	6.5	10.5
op6	5	12
op7	8	9
op8	6.5	10.5
op9	5	12
op10	Continuous operation	
op11		
op12		
op13	6.5	10.5
op14	6.5	10.5
op15	6.5	10.5

CAUTION

- Request installer to set the function during installation.
- In case the function is not used, set the dip S/W OFF and reset the power.
- If ODU Hz and RPM change, cooling capacity may go down.

4.4 Vacuum Mode

This function is used for creating vacuum in the system after compressor replacement, ODU parts replacement or IDU addition/replacement.

Vacuum mode setting method

Master unit PCB DIP switch on : No.5

↓

Select the mode using '▶', '◀' Button : "SVC"
Push the '●' button

↓

Select the Function using '▶', '◀' Button : : "Se3"
Push the '●' button

↓

Start the vacuum mode : "VACC"
ODU V/V open
ODU EEV open
IDU EEV open

Vacuum mode cancellation method

Push the reset button on Master unit PCB

CAUTION

ODU operation stops during vacuum mode. Compressor can't operate.

4.5 Static pressure compensation mode

This function is used for creating vacuum in the system after compressor replacement, ODU parts replacement or IDU addition/replacement.

Static pressure compensation mode setting method

Master unit PCB DIP switch on : No.5

↓

Select the mode using '▶', '◀' Button : "Func"
Push the '●' button

↓

Select the Function using '▶', '◀' Button : "Fn2"
Push the '●' button

↓

Select the Option using '▶', '◀' Button : : "op1~op2"
Push the '●' button

↓

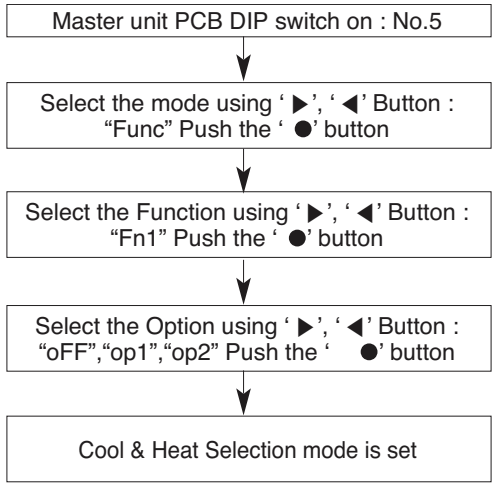
Start the Static pressure compensation mode :
Save the selected option value in EEPROM

FAN Maximum RPM of each step

Capacity (Heat Pump)		8HP	10HP/12HP/14HP
Max. RPM	Standard	800	650
	op1	850	700
	op2	-	750

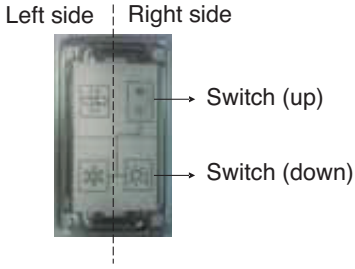
4.6 Cool & Heat selector

mode setting method



mode setting method

Switch control		Function		
Switch(up)	Switch(down)	oFF	op1(mode)	op2(mode)
Right side(on)	Left side(off)	Not operate	Cooling	Cooling
Right side(on)	Right side(on)	Not operate	Heating	Heating
Left side(off)	-	Not operate	Fan mode	Off



CAUTION

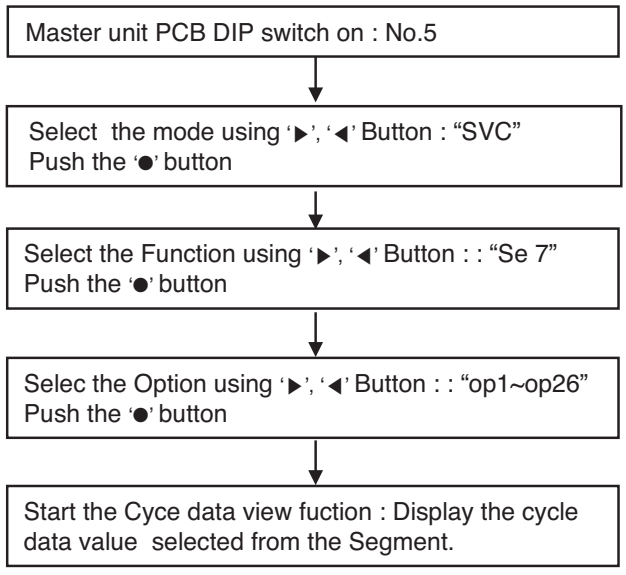
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- If use a function, first install a Cool & Heat selector.

4.7 Cycle Data View

This function is intended to identify the Cycle data of ODU, which is running on.

The 7 Segment is display 26 different cycle data.

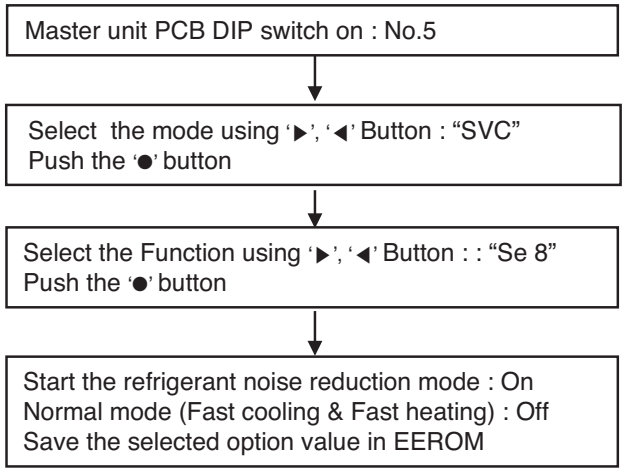
Cycle data view function setting method



No	Title	7-seg	example	Seg_1	Seg_2	Seg_3	Seg_4
1	Current High Pressure	P1	4321 kpa	4	3	2	1
2	Current Low Pressure	P2	1234 kPa	1	2	3	4
3	Inv. Comp.	H1	120 Hz		1	2	0
4	Fan1	H3	110 RPM		1	1	0
5	Fan2	H4	110 RPM		1	1	0
6	Superheating degreee	T1	53°C		5	3	0
7	Subcooling degreee	T2	-4.5°C	–		4	5
8	ODU temp.	T3	10°C		1	0	0
9	Suction temp.	T4	43.4°C		4	3	4
10	Comp. discharge temp.	T5	150°C	1	5	0	0
12	Liquid pipe temp.	T7	10°C		1	0	0
14	SC_OUT	T9	10°C		1	0	0
15	Hex	T10	10°C		1	0	0
18	Inlet pipe average temp. of IDU	T13	-10°C	–	1	0	0
19	Main EEV	PLS1	1950 pls	1	9	5	0
21	SC EEV	PLS3	16 pls			1	6
25	IDU running capacity	IDU1	24 KBtu			2	4
26	Total number of IDU	IDU2	10 EA			1	0

4.8 Refrigerant noise reduction mode

Refrigerant noise reduction mode setting method



Part 3
PCB Setting and Test Run

Test Run

1. Checks Before Test Run

1	Check to see whether there is any refrigerant leakage, and slack of power or communication cable.
2	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. NOTE: Never carry out megaohm check over terminal control board. Otherwise the control board would be broken. 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 MΩ as a result of refrigerant accumulating in the internal compressor. If the insulation resistance is less than 2 MΩ, turning on the main power supply and energizing the crankcase heater for more than 6 hours will cause the refrigerant to evaporate, increasing the insulation resistance.
3	Check if high/low pressure common pipe, liquid pipe and gas pipe valves are fully opened. NOTE: Be sure to tighten caps.
4	Check if there are any problems in automatic addressing or not: Check and confirm that there are no error messages in the display of indoor units or remote controls and LED in outdoor units.

CAUTION

when cutting main power of the Multi V

- **Always apply main power of the outdoor unit during use of product (cooling season/heating season).**
- **Always apply power before 4 hours to heat the crank case heater where performing test run after installation of product. It may result in burning out of the compressor if not preheating the crank case with the electrical heater for more than 4 hours.(In case of the outdoor temperature below 10°C)**

CAUTION

Preheat of compressor

- **Start preheat operation for 4 hours after supplying main power.**
- **In case that the outdoor temperature is low, be sure to supply power 4 hours before operation so that the heater is heated(insufficient heating may cause damage of the compressor.)**

2. How to cope with Test Run abnormality

The phenomena from main component failure

Component	Phenomenon	Cause	Check method and Trouble shooting
Compressor	Not operating	Motor insulation broken	Check resistance between terminals and chassis
		Strainer clogged	Change strainer
		Oil leakage	Check Oil level after opening oil port
	Stop during running	Motor insulation failure	Check resistance between terminals and chassis
	Abnormal noise during running	R-S-T misconnection	Check compressor R-S-T connection
Outdoor fan	High pressure error at cooling	Motor failure, bad ventilation around outdoor heat exchanger	Check the outdoor fan operation after being turned the outdoor units off for some time. Remove obstacles around the outdoor units
Outdoor EEV	Heating failure, frequent defrosting	Bad connector contact	Check connector
	No operating sound at applying power	Coil failure	Check resistance between terminals
	Heating failure, frozen outdoor heat exchanger part	EEV clogged	Service necessary
	Low pressure error or discharge temperature error	EEV clogged	Service necessary

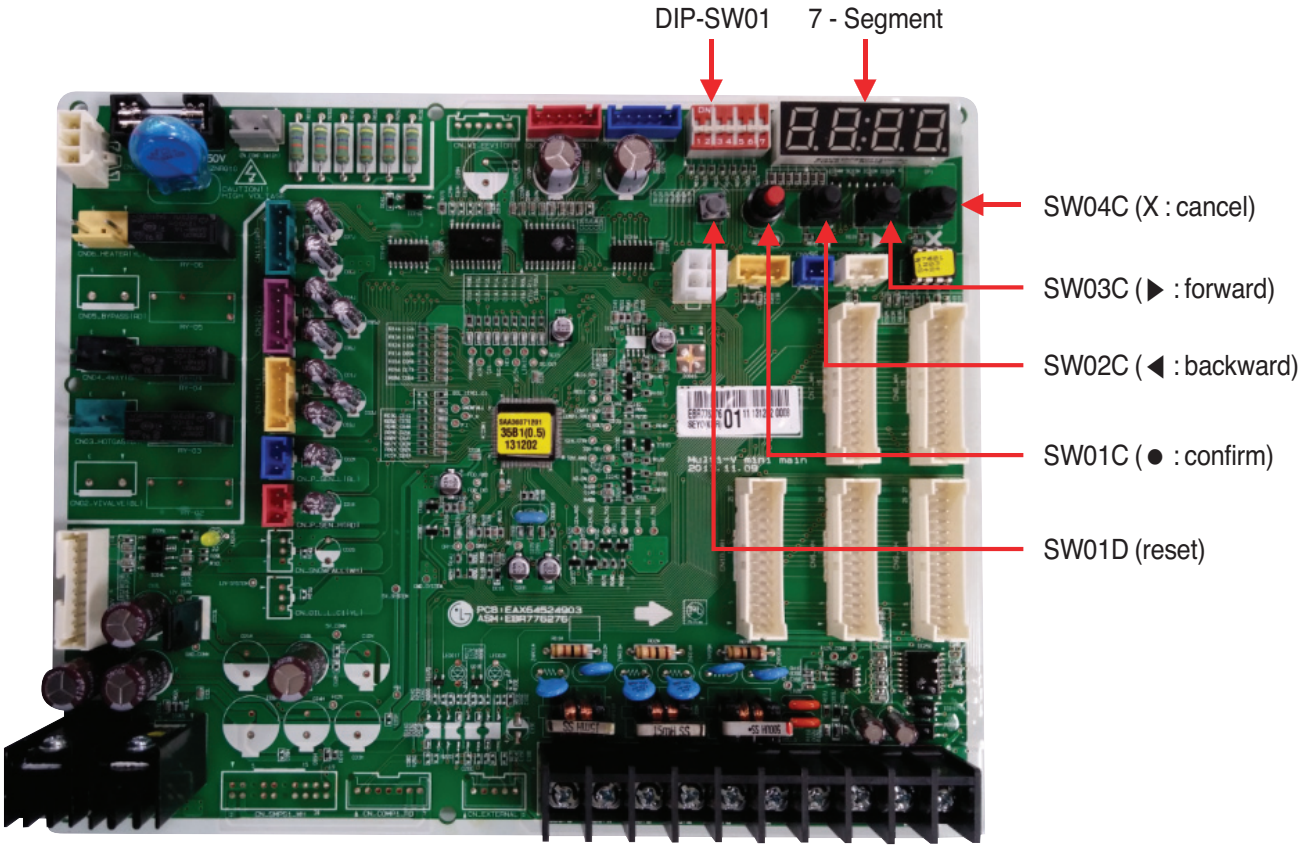
When system fault occurs, the error code is displayed at indoor unit display or remote control display, the trouble shooting guide is in the service manual

• When CH05/53 ERROR occurs, check if auto-addressing has done and communication wiring is ok.

3. DIP Switch Setting

■ Location of setting Switch

Main PCB



Checking the setting of outdoor units

■ Checking according to dip switch setting

1. You can check the setting values of the Master outdoor unit from the 7 segment LED.
   The dip switch setting should be changed when the power is OFF.
2. It checks whether the input is properly performed without the bad contact of the dip switch or not

■ Checking the setting of outdoor units

Checking according to dip switch setting

- You can check the setting values of the Master outdoor unit from the 7 segment LED.
  The dip switch setting should be changed when the power is OFF.

Checking the initial display

The number is sequentially appeared at the 7 segment in 5 seconds after applying the power. This number represents the setting condition. (For example, represents R410A 10HP)

• Initial display order

Order	No	Note
①	4~14	Model capacity
②	1	Cooling only
	2	Heat pump
③	38	380V
	46	460V
	22	220V
④	1	Standard
	5	Cold temperature area
	6	Tropical

• Example) ARUN100LSS0

①	②	③	④
10	2	38	1

Part 4
Trouble shooting guide

Trouble shooting guide

1. The phenomena from main component failure

The phenomena from main component failure

Component	Phenomenon	Cause	Check method and Trouble shooting
Compressor	Not operating	Motor insulation broken	Check resistance between terminals and chassis
		Strainer clogged	Change strainer
		Oil leakage	Check Oil level after opening oil port
	Stop during running	Motor insulation failure	Check resistance between terminals and chassis
	Abnormal noise during running	R-S-T misconnection	Check compressor R-S-T connection
Outdoor fan	High pressure error in cooling mode operation	Motor failure, bad ventilation around outdoor heat exchanger	Check the fan operation to confirm proper motor functioning. Switch OFF the outdoor unit and remove obstacles, if any, around the HEX. Check connector
Outdoor EEV	Heating failure, frequent defrosting	Bad connector contact	Check resistance between terminals
	No operation sound after switching ON the power supply	Coil failure	Service necessary
	Heating failure, frozen outdoor heat exchanger part	EEV clogged	Service necessary
	Low pressure error or discharge temperature error	EEV clogged	

When system fault occurs, the error code is displayed on the indoor unit display or remote control display. The trouble shooting guide is available in the service manual.

• When CH05/53/11 ERROR occurs, check if auto-addressing has done and communication wiring is ok.

2. Checking Method for Key Components

2.1 Compressor

Check and ensure in following order when error related with the compressor or error related with power occurs during operation:

<table>
<tr><th>No.</th><th>Checking Item</th><th>Symptom</th><th>Countermeasure</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Is how long power on during operation?</td><td>1) Power on for 12 hours or more</td><td>* Go to No.2.</td></tr>
<tr><td>2) Power on for 12 hours or less</td><td>* Go to No.2 after applying power for designated time (12 hours).</td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">Does failure appears again when starting operation?

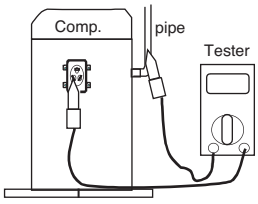
Method to measure insulation resistance
 

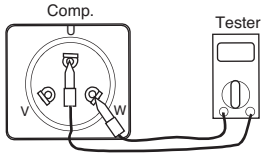
Figure 1.
Method to measure coil resistance
 

Figure 2.</td><td>1) The compressor stops and same error appears again.</td><td>* Check IPM may fail.</td></tr>
<tr><td>2) If output voltage of the inverter is stably output. Note 1)</td><td>* Check coil resistor and insulation resistor. If normal, restart the unit. If same symptom occurs, replace the compressor.
* Insulation resistor : 50MΩ or more
* Coil resistor (below table)
GPT442MAA
<table><tr><td>Temp</td><td>75°C</td></tr><tr><td>U-V</td><td>0.845 Ω</td></tr><tr><td>V-W</td><td>0.859 Ω</td></tr><tr><td>W-U</td><td>0.864 Ω</td></tr></table>JBA068MAF
<table><tr><td>Temp</td><td>25°C</td><td>75°C</td></tr><tr><td>U-V</td><td>0.163 ± 7% Ω</td><td>0.195 ± 7% Ω</td></tr><tr><td>V-W</td><td>0.163 ± 7% Ω</td><td>0.195 ± 7% Ω</td></tr><tr><td>W-U</td><td>0.163 ± 7% Ω</td><td>0.195 ± 7% Ω</td></tr></table>JQA048MAF
<table><tr><td>Temp</td><td>25°C</td><td>75°C</td></tr><tr><td>U-V</td><td>0.178 ± 7% Ω</td><td>0.212 ± 7% Ω</td></tr><tr><td>V-W</td><td>0.178 ± 7% Ω</td><td>0.212 ± 7% Ω</td></tr><tr><td>W-U</td><td>0.178 ± 7% Ω</td><td>0.212 ± 7% Ω</td></tr></table></td></tr>
<tr><td>3) If output voltage of the inverter is unstable or it is 0V.
(When incapable of using a digital tester)</td><td>* Check the IPM.
If the IPM is normal, replace the inverter board.
* Check coil resistor and insulation resistor.</td></tr>
</table>

[Cautions when measuring voltage and current of inverter power circuit]

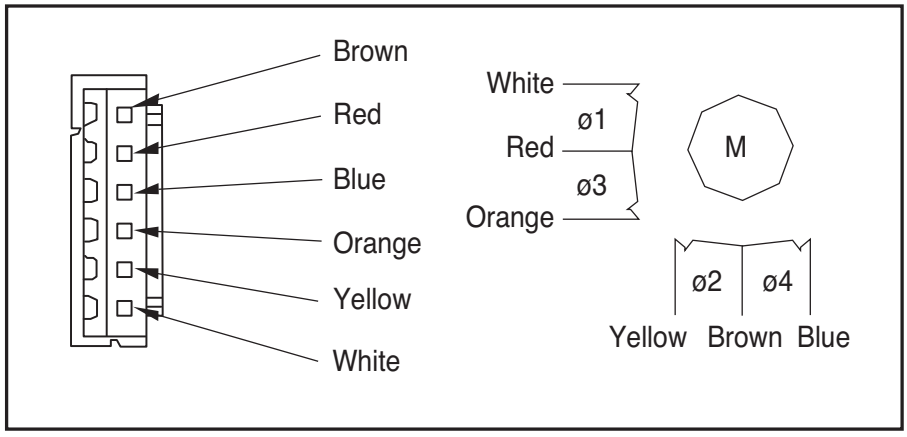
Measuring values may differ depending on measuring tools and measuring circuits since voltage, current in the power supply or output side of the inverter has no since waveform.
Especially, output voltage changes when output voltage of the inverter has a pattern of pulse wave.
In addition, measuring values appear largely differently depending on measuring tools.

1) If using a movable tester when checking that output voltage of the inverter is constant (when comparing relative voltage between lines), always use an analog tester. Especially exercise particular caution if the output frequency of the inverter is low, when using a movable tester, where change of measured voltage values is large between other lines, when virtually same values appear actually or where there is danger to determine that failure of the inverter occurred.
2) You can use rectification voltmeter (⊣▶⊢) if using commercial frequency tester when measuring output values of the inverter (when measuring absolute values). Accurate measuring values cannot be obtained with a general movable tester (For analog and digital mode).

2.2 Fan Motor

Checking Item	Symptom	Countermeasure
(1) The fan motor does not operate. Does failure appears again when starting operation? (2) Vibration of the fan motor is large.	1) When power supply is abnormal	* Modify connection status in front of or at the rear of the breaker, or if the power terminal console is at frosting condition.
		* Modify the power supply voltage is beyond specified scope.
	2) For wrong wiring	* For following wiring. 1. Check connection status. 2. Check contact of the connector. 3. Check that parts are firmly secured by tightening screws. 4. Check connection of polarity. 5. Check short circuit and grounding.

2.3 Electronic Expansion Valve



• Pulse signal output value and valve operation

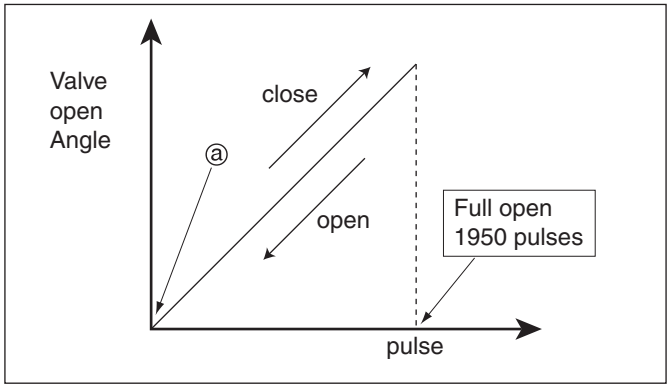
Output(ø) No.	Output state			
	1	2	3	4
ø1	ON	ON	OFF	ON
ø2	ON	ON	ON	OFF
ø3	OFF	OFF	ON	OFF
ø4	OFF	OFF	OFF	ON

• Output pulse sequence

- In valve close state: 4 → 3 → 2 → 1 → 4
- In valve open state: 1 → 2 → 3 → 4 → 1

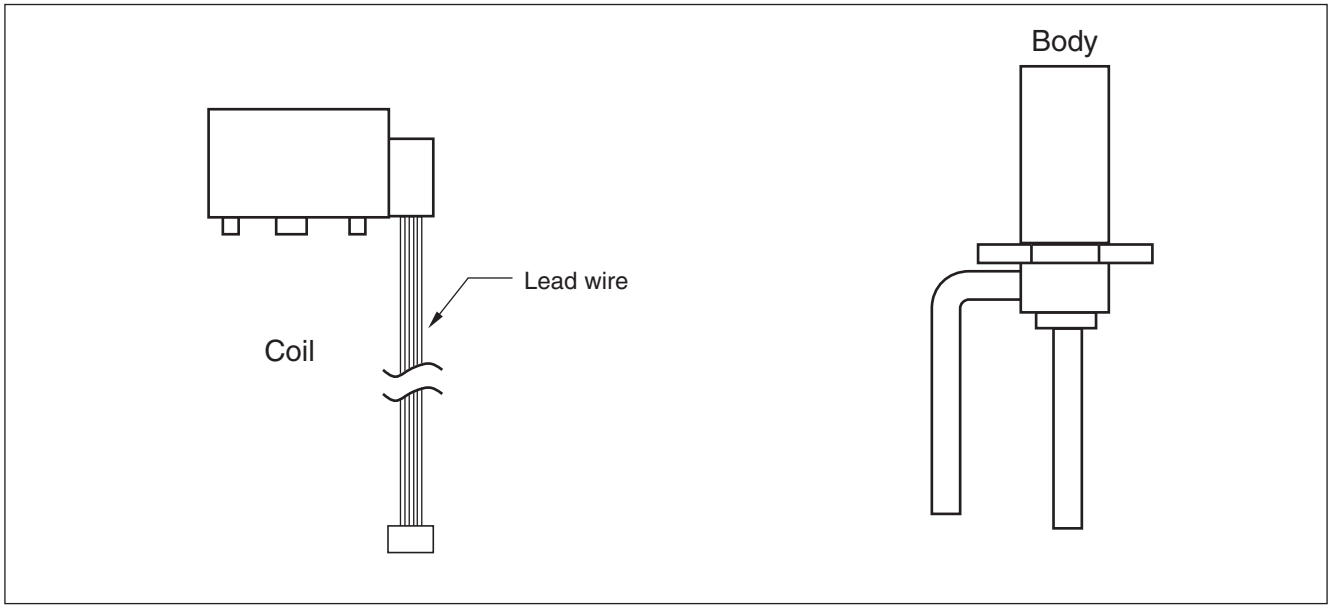
* 1. If EEV open angle does not change, all of output phase will be OFF
2. If output phase is different or continuously in the ON state, motor will not operate smoothly and start vibrating.

• EEV valve operation

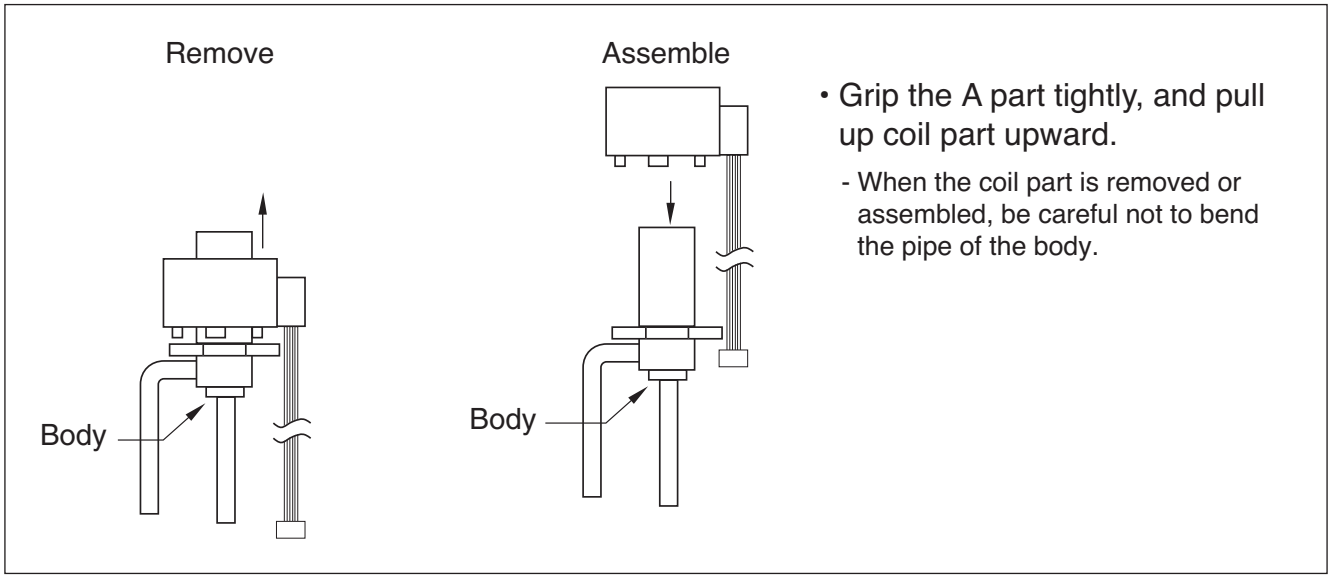


- At power ON, open angle signal of 1400 pulses output and valve position is set to ⓐ
  If valve operates smoothly, no noise and vibration occurs and if valve is closed. noise occurs.
- Noise from EEV can be confirmed by touching the EEV surface with a screw driver and listening the EEV noise.
- If liquid refrigerant is in EEV, the noise is lower.

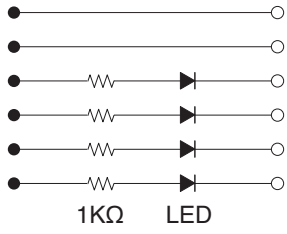
• **EEV Coil and body(Outdoor unit)**



• **Remove and assemble the coil**

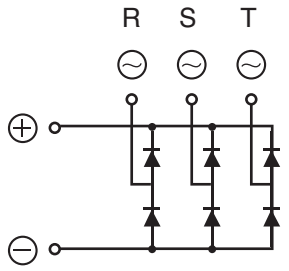


- **EEV failure check method**

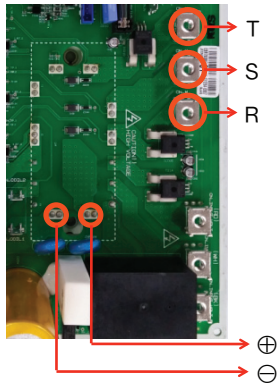
Failure mode	Diagnosis	Repair process	Unit
Microcomputer Driving circuit failure	1.Disconnect the EEV connector form control board and connect testing LED  2. Main power ON, pulse signal is out from EEV for 17 sec. If LEDs do not turn on, or are in on state continuously, then driving circuit is abnormal	Check and replace Indoor unit control board	Indoor unit
EEV locking	1.If EEV is locked, in no load state, the driving motor rotate, and clicking sound always occurs	Replace EEV	Indoor / Outdoor unit
EEV Motor coil short or misconnection	1. Check the resistance between coil terminal (red-white, red-yellow, red-orange, red-blue) 2. If the estimated resistance value is in 52±3 then the EEV is normal	Replace EEV	Outdoor unit
	1. Check the resistance between coil terminal (brown-white, brown-yellow, brown-orange, brown-blue) 2. If the estimated resistance value is in 150±10 then the EEV is normal	Replace EEV	Indoor unit
Full closing (valve leakage)	1. Operate indoor unit with FAN mode and operate another indoor unit with COOLING mode 2. Check indoor unit(FAN mode) liquid pipe temperature (from operation monitor of outdoor unit control board) 3. When fan rotate and EEV is fully closed, if there is any leakage, then the temperature is down If estimated temperature is very low in comparison with suction temperature which is displayed at remote controller then the valve is not fully closed	If the amount of leakage is much, Replace EEV	Indoor unit

2.4 Phase Bridge Diode Checking Method

Internal circuit diagram



Appearance



1. Wait until Comp PCB DC voltage gets discharged, after the main power switch off.
2. Pull out DC_Link connector connected with Inverter PCB.
3. Set multi tester in diode mode.
4. Measured value should be 0.4~0.7V measuring as below table.
5. In case the measured value is different from the table, set multi tester to resistance mode and measure. If the value is small (0 Ω) or high (hundreds M Ω), PCB needs to be replaced.

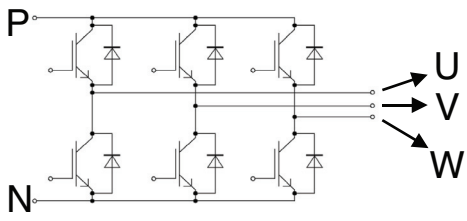
Diode terminal / Tester terminal	+ terminal: black(-)	- terminal: red(+)
R(~) : red(+)	0.4 V ~ 0.7 V	-
S(~) : red(+)	0.4 V ~ 0.7 V	-
T(~) : red(+)	0.4 V ~ 0.7 V	-
R(~) : black(-)	-	0.4 V ~ 0.7 V
S(~) : black(-)	-	0.4 V ~ 0.7 V
T(~) : black(-)	-	0.4 V ~ 0.7 V

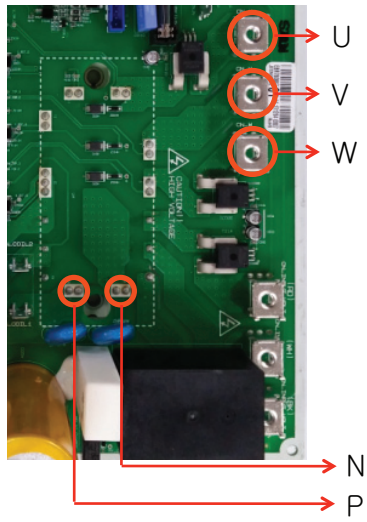
✻ Red(+) and black(-) are the measuring terminals of multi tester.

CAUTION

- **Check the electric parts of c/box, 10 minutes after switching off the main supply and checking DC voltage is discharged. Otherwise, there is chance of getting electric shock.**
- **There is chance of electric shock by charged voltage.**

2.5 Inverter IGBTM Checking Method





Inverter PCB

1. Wait until Comp PCB DC voltage is discharged after main power off.
2. Pull out DC_Link connector and U,V,W comp connector connected with Inverter PCB
3. Set multi tester in diode mode.
4. Measured value should be 0.2~0.6V measuring as below table.
5. In case the measured value is different from the table, set multi tester to resistance mode and measure. If the value is small(0Ω) or high(hundreds MΩ), PCB needs to be replaced.
6. In case that IGBTM is damaged, check if comp is needed to be replaced

	P terminal : black(-)	N terminal: red(+)
U terminal : red(+)	0.2V~0.6V	
V terminal : red(+)	0.2V~0.6V	
W terminal : red(+)	0.2V~0.6V	
U terminal : black(-)		0.2V~0.6V
V terminal : black(-)		0.2V~0.6V
W terminal : black(-)		0.2V~0.6V

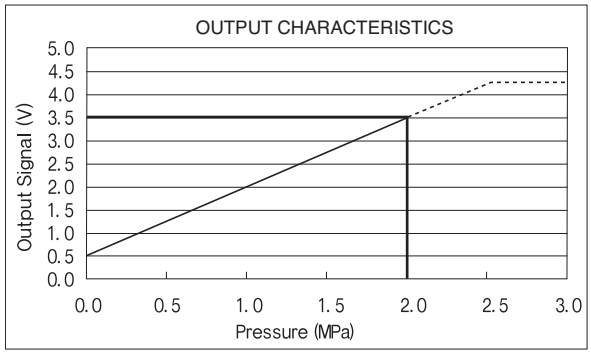
✻ Red(+) and black(-) are the measuring terminals of multi tester.

2.6 Pressure Sensor(High/Low Pressure Sensor)

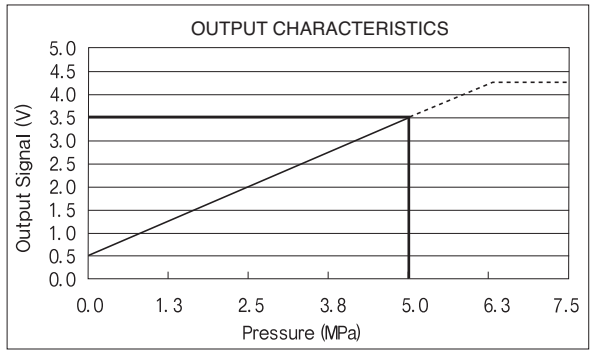
Connect manifold gauge to the service valve of outdoor unit, and compare the output of high pressure sensor to the output of low pressure sensor to detect the defect.

below) Compare the output of pressure sensor to the output of manifold gauge pressure using the table below. Read the pressure clearly between black and white as the composition of pressure sensor.

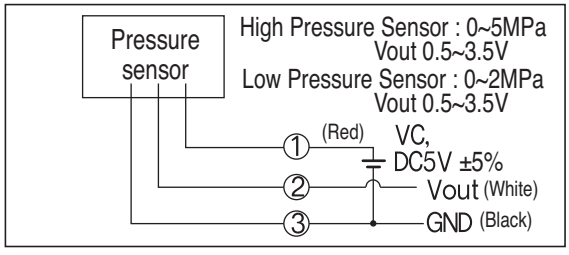
<Low Pressure Sensor>



<High Pressure Sensor>



1) If the pressure of manifold gauge is 0~1kg/cm², it indicates the pressure got lower due to the leakage of refrigerant. Find the place of leakage and fix it.
2) If the difference of the outputs of high and low pressure is in the range of 1kg/cm², the pressure sensor is normal.
3) If the difference of the outputs of high and low pressure is over 1kg/cm², the pressure sensor is out of order, it need to be replaced.
4) The composition of pressure sensor



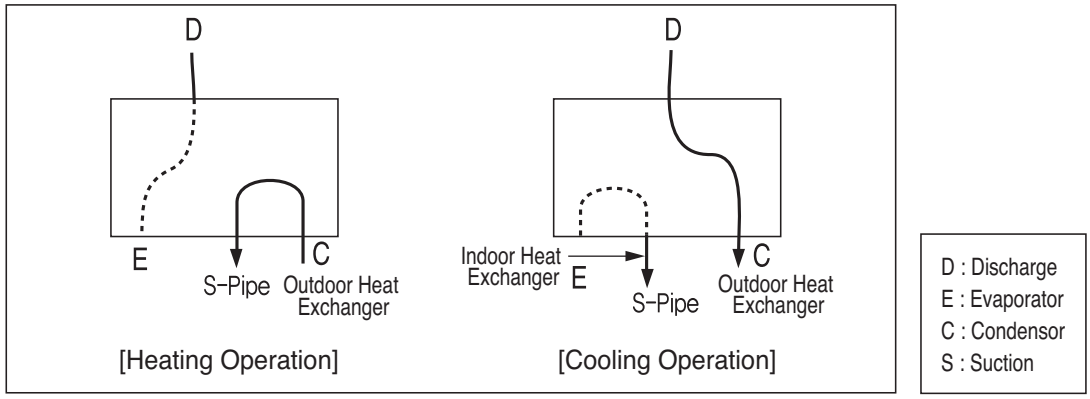
The pressure sensor is composed like the circuit picture shown above. If DC 5V voltage flows on red and black wire, voltage would be made between the white and black wire. The pressure which is equivalent to the pressure output is shown in the table above.

2.7 Outdoor Fan

1) The outdoor fan is controlled by the inverter motor which can control the number of rotations.
2) The outdoor fan is controlled by the high/low pressure of the outdoor unit after the operation of compressor.
3) There is possibility that the outdoor fan does not operate due to low capacity operation or low outdoor temperature even if the compressor is operating. This does not mean breakdown of the unit, the fan will start operating if it reaches the set point.

2.8 4 way Valve

1. Keep it off before the outdoor unit is powered on and the indoor unit is turned on.
2. Cooling, defrosting, oil recovery : OFF, heating : ON
3. When alternating cooling to heating, transform 4 way valve during re-starting for 3 minutes.
4. To check the mode of cooling/heating operation of 4 way valve, touch the piping surface of low pressure service valve.
5. Refrigerant flowchart of 4 way valve



6. Insulation resistance in the state of connecting the valve to coil should be over 100mΩ when measure it with DC mega tester(DC 500V).

2.9 Temperature Sensor

1) Outdoor temperature sensor : TH1

2) Discharge pipe(D-pipe) temperature sensor : TH2
   1. Check the condition of installation and the contact of temperature sensor.
   2. Check whether the connector contact of temperature sensor is normal.
   3. Measure the resistance of temperature sensor.

3) Pipe temperature sensor : TH3

	TH1	TH2	TH3
Resistance	10kΩ±1%(25°C)	200kΩ±1%(25°C)	5kΩ±1%(25°C)
	1.07kΩ±3.3%(85°C)	28kΩ±7.7%(85°C)	535Ω±3.3%(85°C)

3. Self-diagnosis function

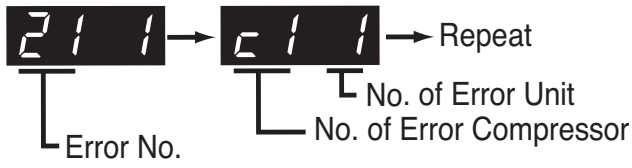
Error Indicator

- This function indicates types of failure in self-diagnosis and occurrence of failure for air condition.
- Error mark is displayed on display window of indoor units and wired remote controller, and 7-segment LED of outdoor unit control board as shown in the table.
- If more than two troubles occur simultaneously, lower number of error code is first displayed.
- After error occurrence, if error is released, error LED is also released simultaneously.

Error Display

1st,2nd,3rd LED of 7-segment indicates error number, 4th LED indicates unit number.

Ex)



Display			Title	Cause of Error
Indoor unit related error	0	1	Air temperature sensor of indoor unit	Air temperature sensor of indoor unit is open or short
	0	2	Inlet pipe temperature sensor of indoor unit	Inlet pipe temperature sensor of indoor unit is open or short
	0	3	Communication error : wired remote controller ↔ indoor unit	Failing to receive wired remote controller signal in indoor unit PCB
	0	4	Drain pump	Malfunction of drain pump
	0	5	Communication error : outdoor unit ↔ indoor unit	Failing to receive outdoor unit signal in indoor unit PCB
	0	6	Outlet pipe temperature sensor of indoor unit	Outlet pipe temperature sensor of indoor unit is open or short
	0	9	Indoor EEPROM Error	In case when the serial number marked on EEPROM of Indoor unit is 0 or FFFFFF
	1	0	Poor fan motor operation	Disconnecting the fan motor connector/Failure of indoor fan motor lock
Outdoor unit related error	2	1	Outdoor Unit Inverter Compressor IPM Fault	Outdoor Unit Inverter Compressor Drive IPM Fault
	2	2	Inverter Board Input Over Current(RMS) of Outdoor Unit	Outdoor Unit Inverter Board Input Current excess (RMS)
	2	3	Outdoor Unit Inverter Compressor DC link Low Voltage	DC charging is not performed at Outdoor Unit after starting relay turn on.
	2	4	Outdoor Unit High Pressure Switch	System is turned off by Outdoor Unit high pressure switch.
	2	5	Outdoor Unit Input Voltage High/ Low Voltage	Outdoor Unit input voltage is over 487V or below 270V
	2	6	Outdoor Unit Inverter Compressor Start Failure	The First Start Failure by Outdoor Unit Inverter Compressor Abnormality
	2	9	Outdoor Unit Inverter Compressor Over Current	Outdoor Unit Inverter Compressor Fault OR Drive Fault

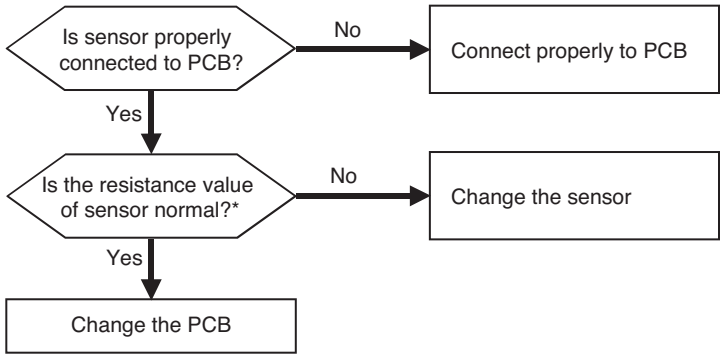
※ Refer to the Indoor manual for some Indoor Error code.

Display			Title	Cause of Error
Outdoor unit related error	3	2	Outdoor Unit Inverter Compressor1 High Discharge Temperature	Outdoor Unit Inverter Compressor1 High Discharge Temperature
	3	4	High Pressure of Outdoor Unit	High Pressure of Outdoor Unit
	3	5	Low Pressure of Outdoor Unit	Low Pressure of Outdoor Unit
	3	6	Outdoor Unit Low Compression Ratio Limited	Outdoor Unit Low Compression Ratio Limited
	4	0	Outdoor Unit Inverter Compressor CT Sensor Fault	Outdoor Unit Inverter Compressor CT Sensor open or short
	4	1	Outdoor Unit Inverter Compressor1 Discharge Temperature Sensor Fault	Outdoor Unit Inverter Compressor Discharge Temperature Sensor open or short
	4	2	Outdoor Unit Low Pressure Sensor Fault	Outdoor Unit Low Pressure Sensor open or short
	4	3	Outdoor Unit High Pressure Sensor Fault	Outdoor Unit High Pressure Sensor open or short
	4	4	Outdoor Unit Air Temperature Sensor Fault	Outdoor Unit Air Temperature Sensor open or short
	4	5	Outdoor Unit Heat Exchanger Temperature Sensor (Front side) Fault	Outdoor Unit Heat Exchanger Temperature Sensor(Front side) open or short
	4	6	Outdoor Unit Suction Temperature Sensor Fault	Outdoor Unit Suction Temperature Sensor open or short
	5	0	Omitting connection of R, S, T power of Outdoor Unit	Omitting connection of outdoor unit
	5	1	Excessive capacity of indoor units	Excessive connection of indoor units compared to capacity of Outdoor Unit
	5	2	Communication error : inverter PCB → Main PCB	Failing to receive inverter signal at main PCB of Outdoor Unit
	5	3	Communication error : indoor unit → Main PCB of Outdoor Unit	Failing to receive indoor unit signal at main PCB of Outdoor Unit .
	5	7	Communication error : Main PCB → inverter PCB	Failing to receive signal main PCB at inverter PCB of Outdoor Unit
	6	0	Inverter PCB EEPROM Error of Outdoor Unit	Access Error of Inverter PCB of Outdoor Unit
	6	2	Outdoor Unit Inverter Heatsink High Temperature	System is turned off by Outdoor Unit Inverter Heatsink High Temperature
	6	5	Outdoor Unit Inverter Heatsink Temperature Sensor Fault	Outdoor Unit Inverter Heatsink Temperature Sensor open or short
	6	7	Outdoor Unit Fan Lock	Restriction of Outdoor Unit
	7	1	Converter CT Sensor Error of Outdoor Unit	Converter CT Sensor Error of Outdoor Unit
	8	6	Outdoor Unit Main PCB EEPROM Error	Communication Fail Between Outdoor Unit Main MICOM and EEPROM or omitting EEPROM

Display				Title	Cause of Error
Outdoor unit related error	1	1	3	Outdoor Unit Liquid pipe Temperature Sensor Error	Liquid pipe temperature sensor of Outdoor Unit is open or short
	1	1	5	Outdoor Unit Subcooling Outlet Temperature Sensor Error	Outdoor Unit Subcooling Outlet Temperature Sensor Error
	1	5	1	Failure of operation mode conversion at Outdoor Unit	Failure of operation mode conversion at Outdoor Unit

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

■ Error diagnosis and countermeasure flow chart

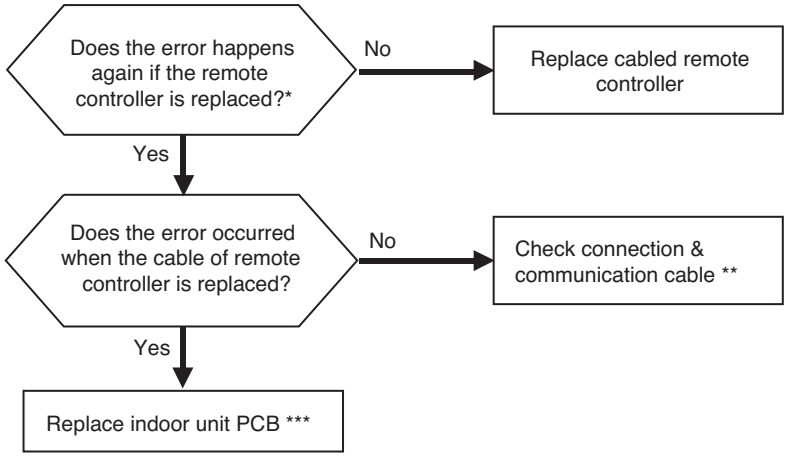


** In case the value is more than 100kΩ (open) or less than 100Ω (short), Error occurs

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

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

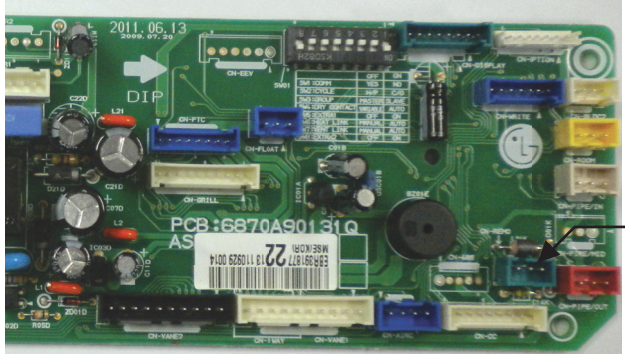
■ Error diagnosis and countermeasure flow chart



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

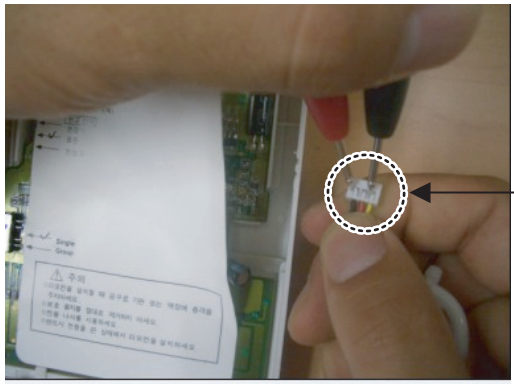
** Check cable : Contact failure of connected portion or extension of cable are main cause
Check any surrounded noise (check the distance with main power cable)
➔ make safe distance from the devices generate electromagnetic wave

*** 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

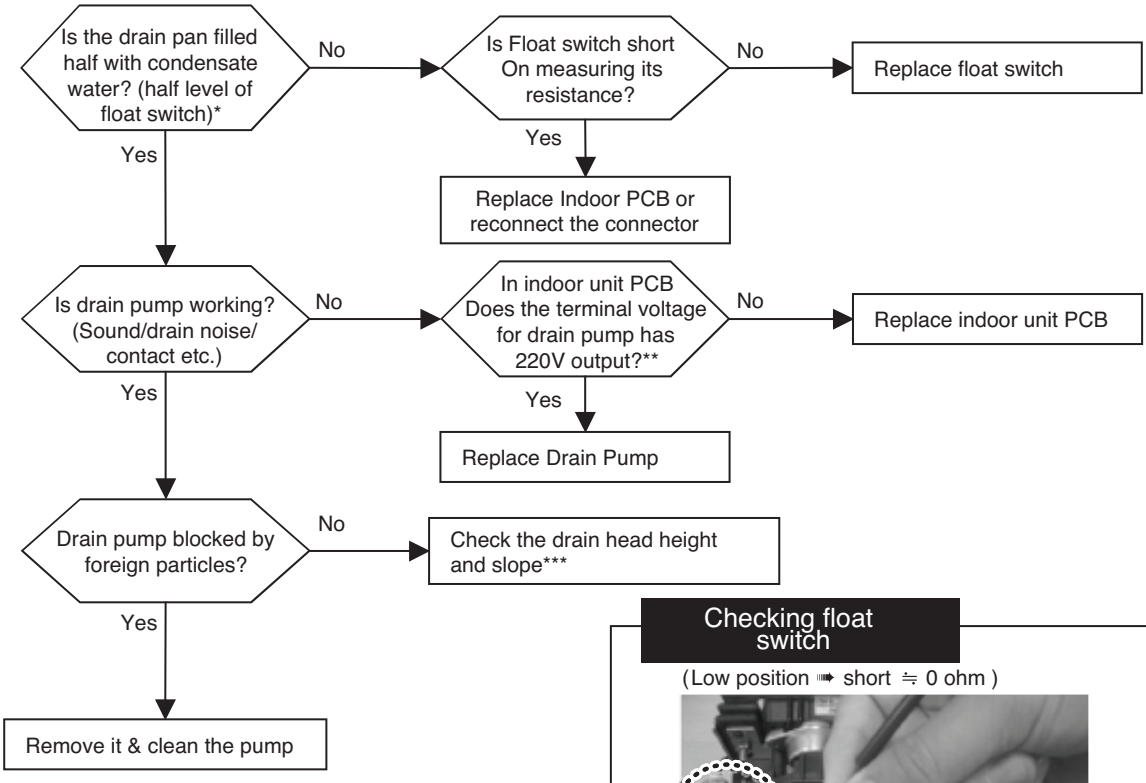
※ The PCB can differ from model to model.
Check from the right source.



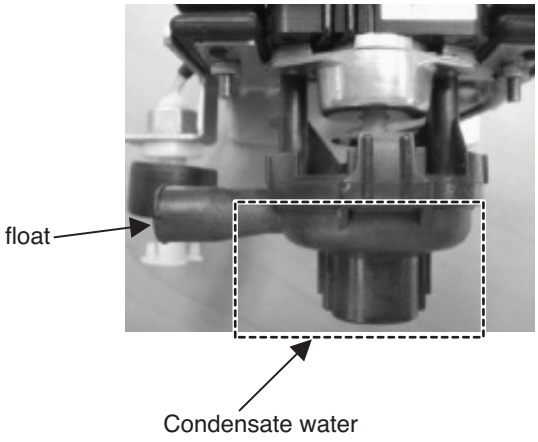
Checking communication cable connection status

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

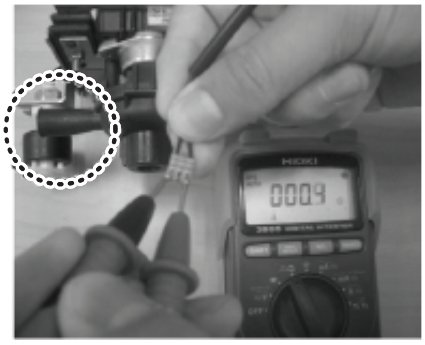


* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.

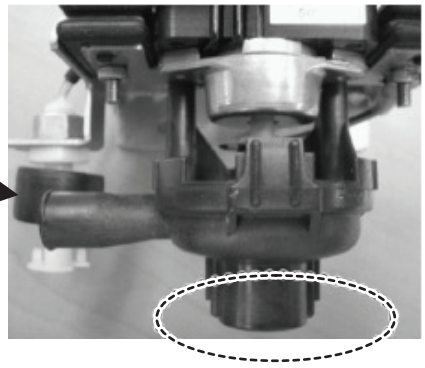


Checking float switch

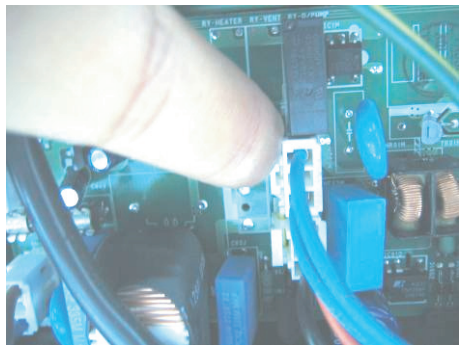
(Low position ➠ short ≒ 0 ohm)



(High position ➠ Open)



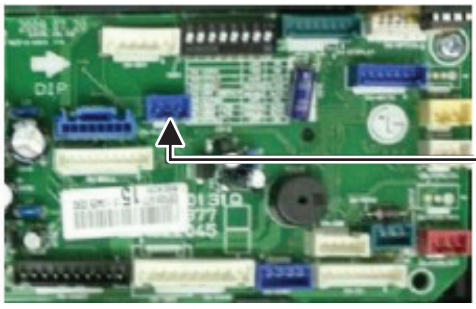
A:Point to check rotating



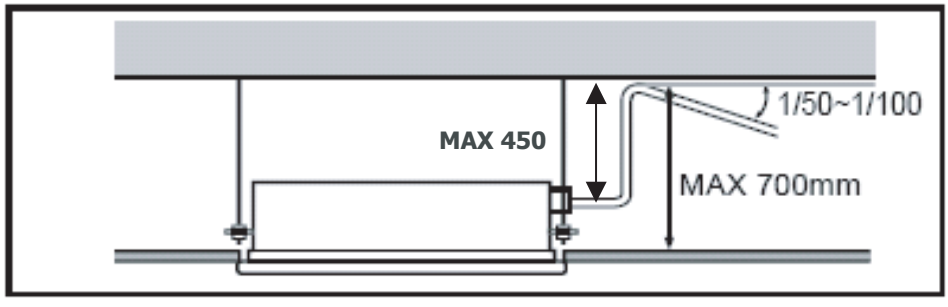
*** Indoor PCB drain pump connector

(Check input of 220V)

(Marked as **CN-DPUMP)**

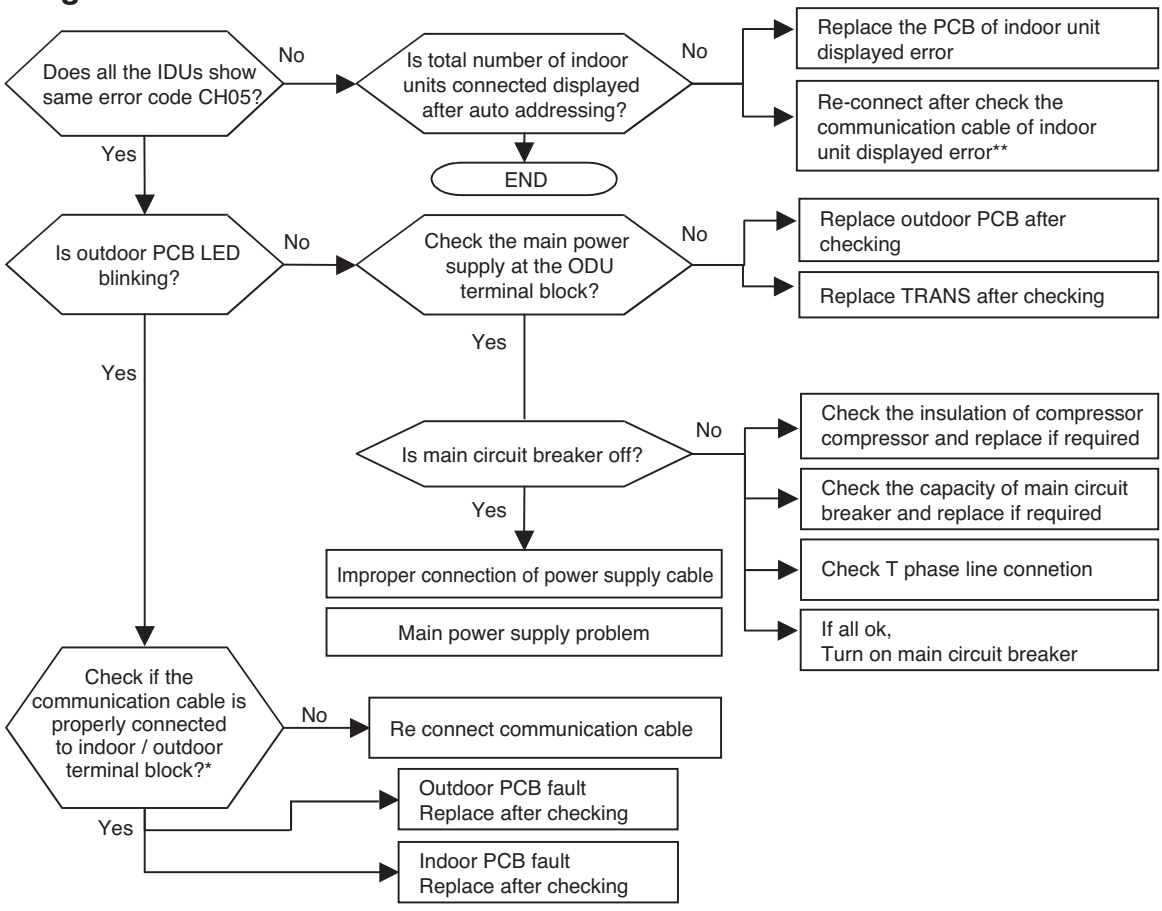


[***] Standard of drain pipe head height / slope

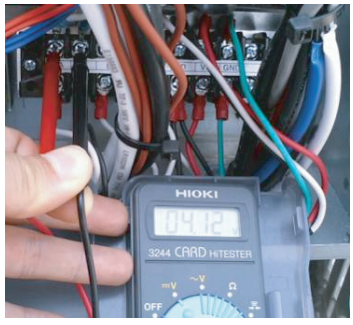


Error No.	Error Type	Error Point	Main Reasons
05	Indoor & Outdoor unit communication error	No signal communication between indoor & outdoor units.	1. Auto addressing is not done 2. Communication cable is not connected 3. Short circuit of communication cable 4. Indoor unit communication circuit fault 5. Outdoor unit communication circuit fault 6. Not enough distance between power and communication cable? 7. T phase line disconnection or N phase connected.

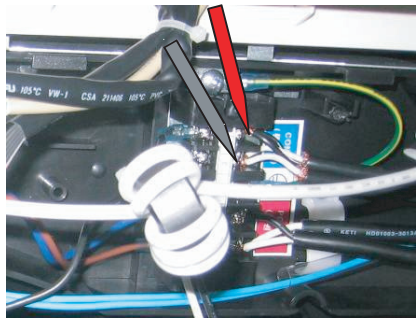
■ Error diagnosis and countermeasure flow chart



* (Note1) communication from IDU is normal if voltage fluctuation(-9V ~ +9V) exists when checking DC voltage of communication terminal between IDU and ODU



* If the DC voltage between communication terminal A, B of indoor unit is fluctuate within (-9V~+9V) then communication from outdoor unit is normal



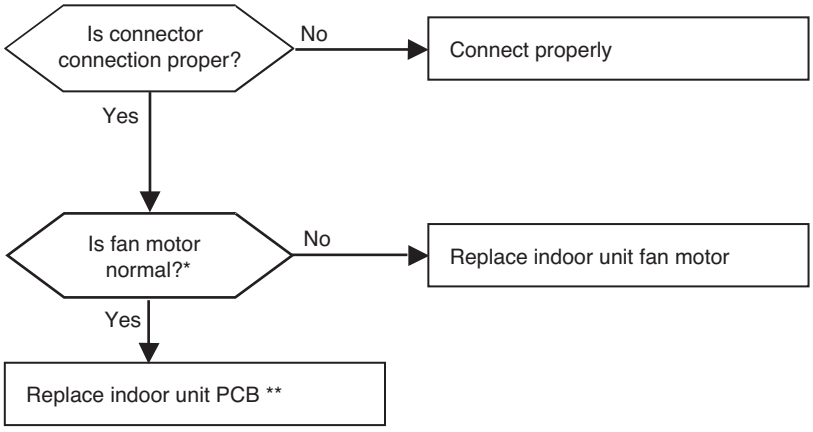
Error No.	Error Type	Error Point	Main Reasons
09	Indoor unit EEPROM error	Error occur in EEPROM of the Indoor PCB	1. Error developed in communication between the micro- processor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage

■ Error diagnosis and countermeasure flow chart

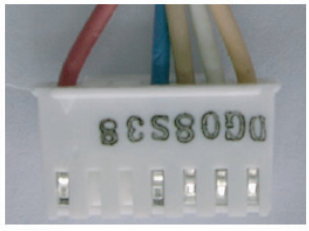
- Replace the indoor unit PCB, and then make sure to perform Auto addressing and input the address of central control

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

■ Error diagnosis and countermeasure flow chart



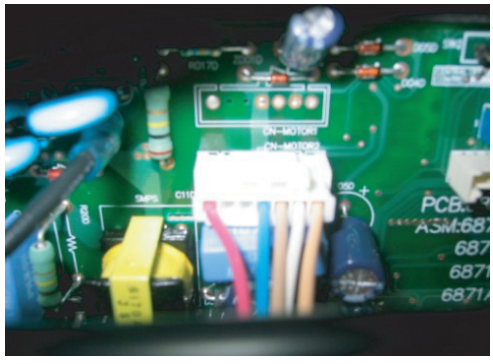
* It is normal when check hall sensor of indoor fan motor as shown below



Each termainl with the tester

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

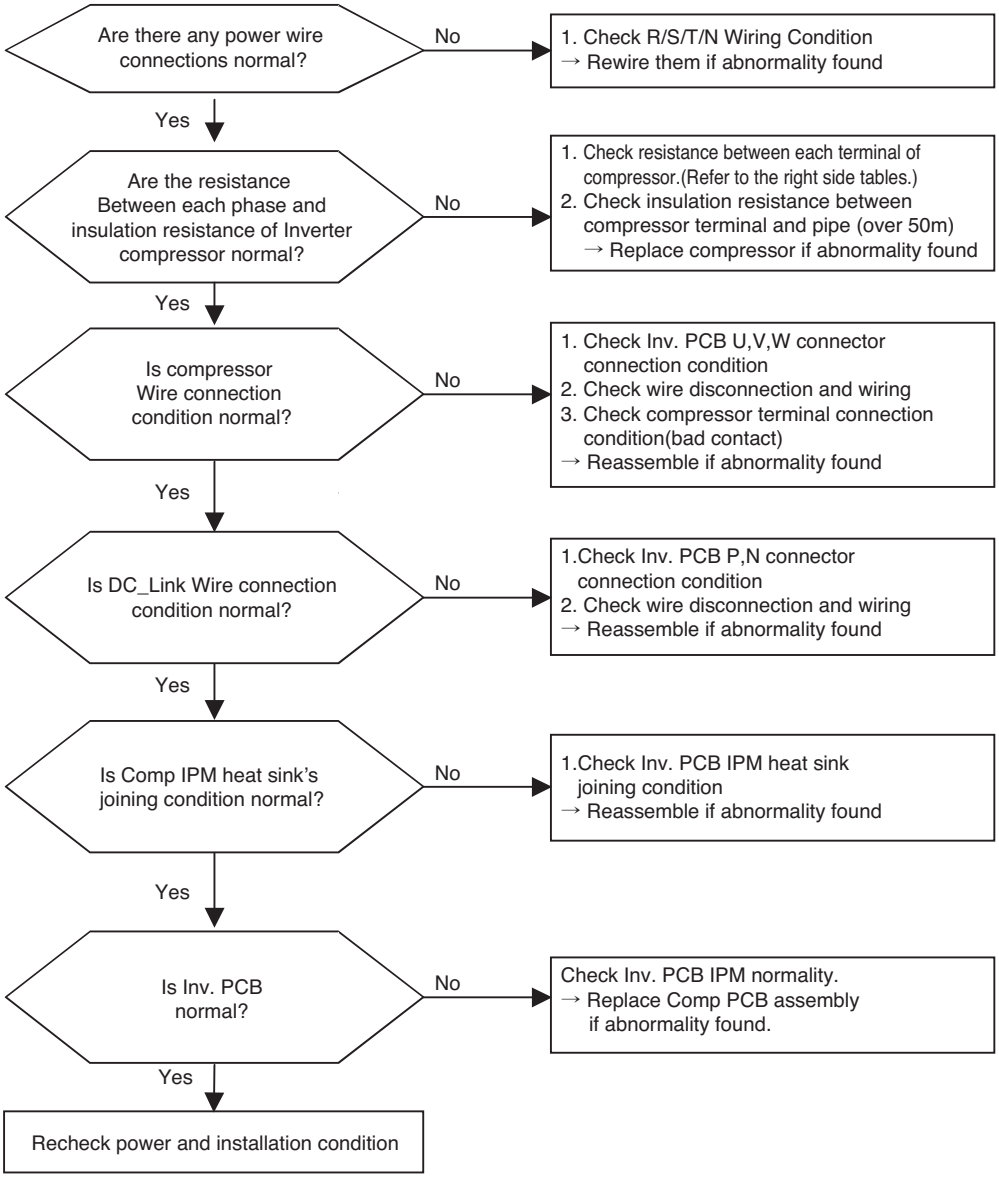
<Checking connection state of fan motor connector>



** Replace the indoor unit PCB, and then make sure to do Auto addressing and input the address of central control
(Notice: The connection of motor connector to PCB should be done under no power supplying to PCB)

Error No.	Error Type	Error Point	Main Reasons
211	Inv. PCB IPM Fault occur	IPM self protection circuit activation (Overcurrent/IPM overheating/Vcc low voltage)	1.Over current detection at Inverter compressor(U,V,W) 2.Compressor damaged (insulation damaged/Motor damaged) 3.IPM overheating (Heat sink disassembled) 4.Inverter compressor terminal disconnected or loose 5.Inverter PCB assembly damaged 6.ODU input current low

■ Error diagnosis and countermeasure flow chart



JBA068MAF

Temp	25°C	75°C
U-V	0.163 ± 7% Ω	0.195 ± 7% Ω
V-W	0.163 ± 7% Ω	0.195 ± 7% Ω
W-U	0.163 ± 7% Ω	0.195 ± 7% Ω

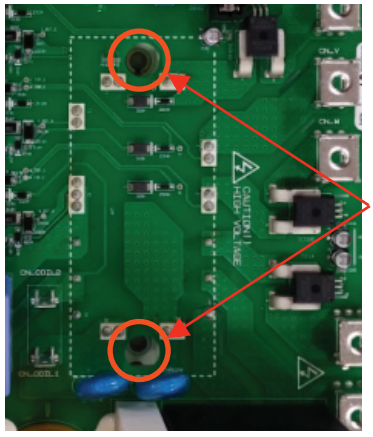
JQA048MAF

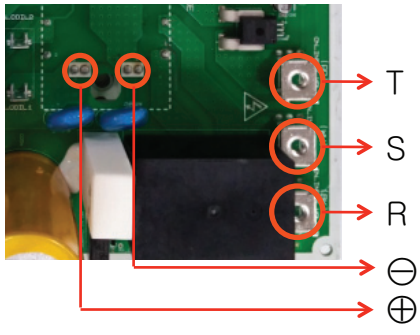
Temp	25°C	75°C
U-V	0.178 ± 7% Ω	0.212 ± 7% Ω
V-W	0.178 ± 7% Ω	0.212 ± 7% Ω
W-U	0.178 ± 7% Ω	0.212 ± 7% Ω

* Measuring resistance between each terminal of compressor

* Compressor wire connector connection point

* IPM joining point

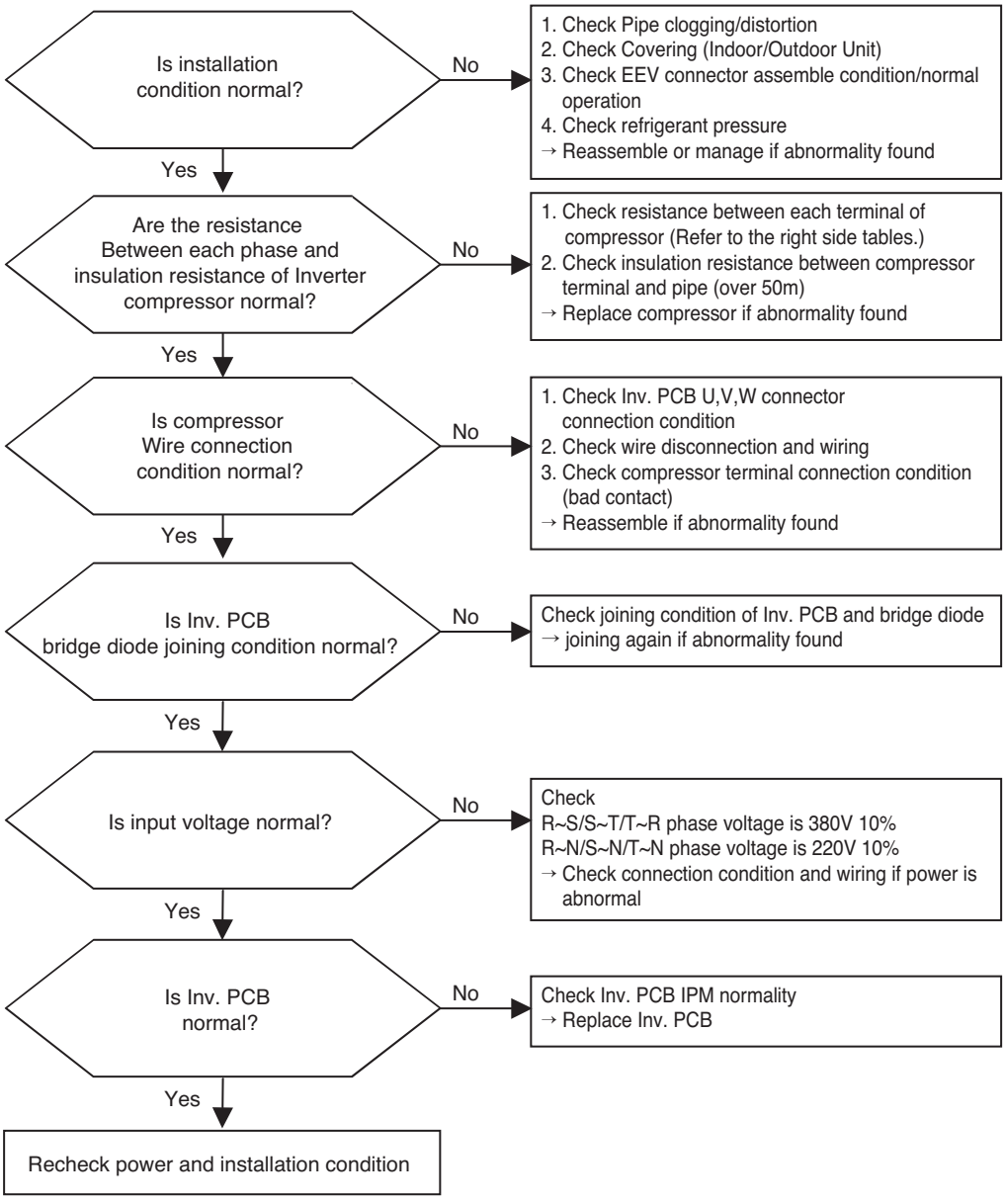




Check DC_Link Connector joining condition

Error No.	Error Type	Error Point	Main Reasons
221	AC Input Current Over Error	Inv. PCB input 3 phase power current is over limited value(24A)	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. Power Line Misconnection 5. Inv. PCB damage (Input current sensing part)

■ Error Diagnosis and Countermeasure Flow Chart



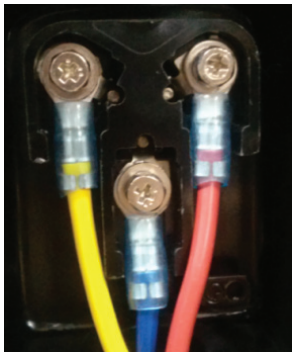
JBA068MAF

Temp	25°C	75°C
U-V	0.163 ± 7% Ω	0.195 ± 7% Ω
V-W	0.163 ± 7% Ω	0.195 ± 7% Ω
W-U	0.163 ± 7% Ω	0.195 ± 7% Ω

JQA048MAF

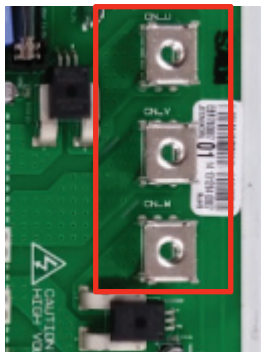
Temp	25°C	75°C
U-V	0.178 ± 7% Ω	0.212 ± 7% Ω
V-W	0.178 ± 7% Ω	0.212 ± 7% Ω
W-U	0.178 ± 7% Ω	0.212 ± 7% Ω

* Measuring resistance between each terminal of compressor

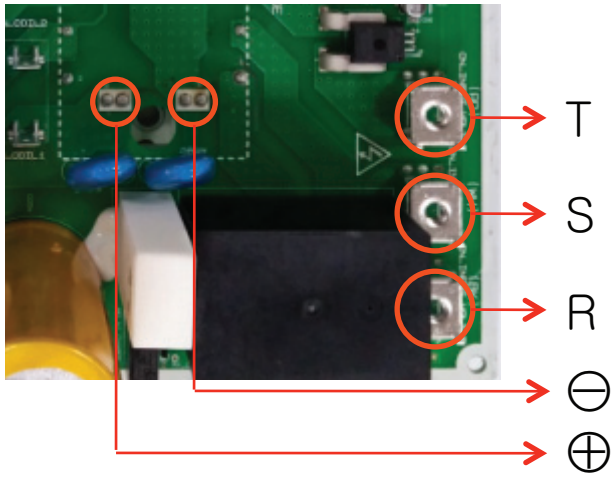


* Measuring input voltage

* Compressor wire connector connection

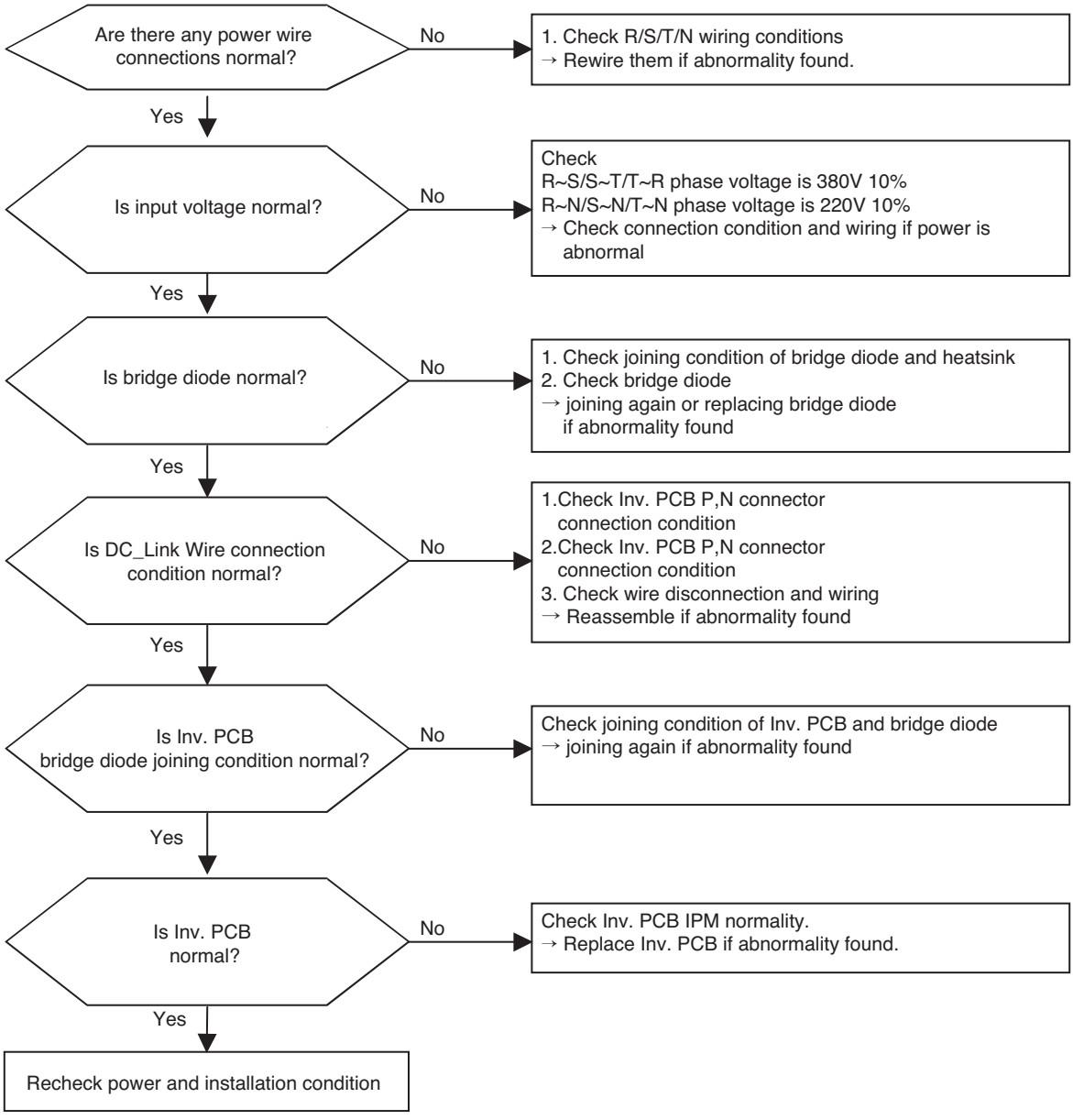


* Check DC_Link Connector joining condition

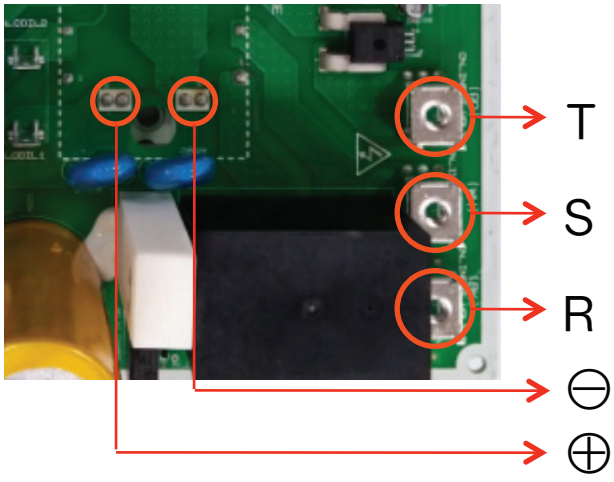


Error No.	Error Type	Error Point	Main Reasons
231	Inverter Compressor DC Link Low Voltage	DC Voltage isn't charged after starting relay on	1. DC Link terminal misconnection/terminal contact fault 2. Starting relay damage 3. Condenser damage 4. Inv. PCB damage (DC Link voltage sensing part) 5. Input voltage low

■ Error Diagnosis and Countermeasure Flow Chart



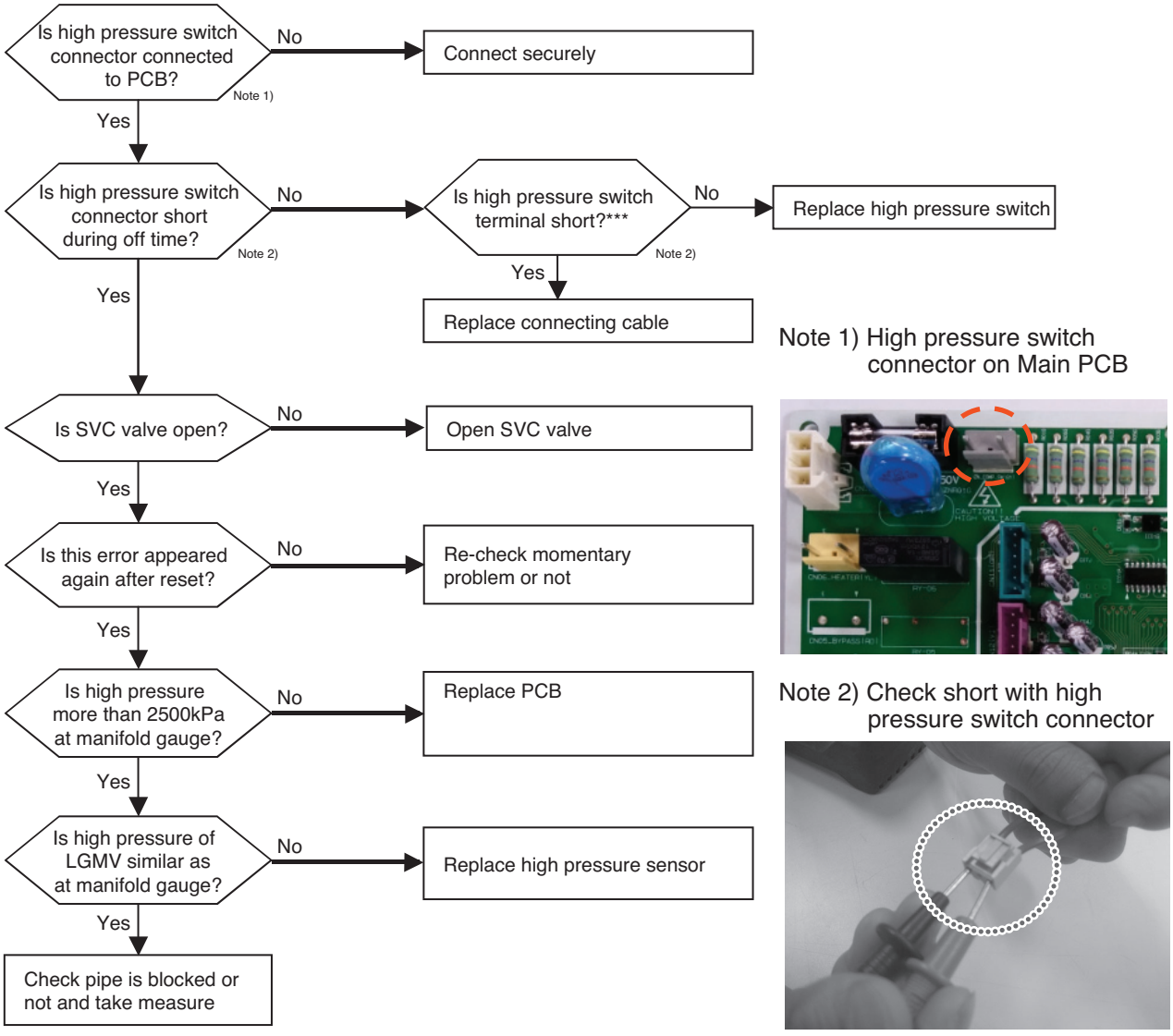
* Check DC_Link Connector joining condition



* Measuring input voltage

Error No.	Error Type	Error Point	Main Reasons
241	Excessive rise of discharge pressure in outdoor compressor	Compressor off due to the high pressure switch in outdoor unit	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 LEV 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

■ Error diagnosis and countermeasure flow chart

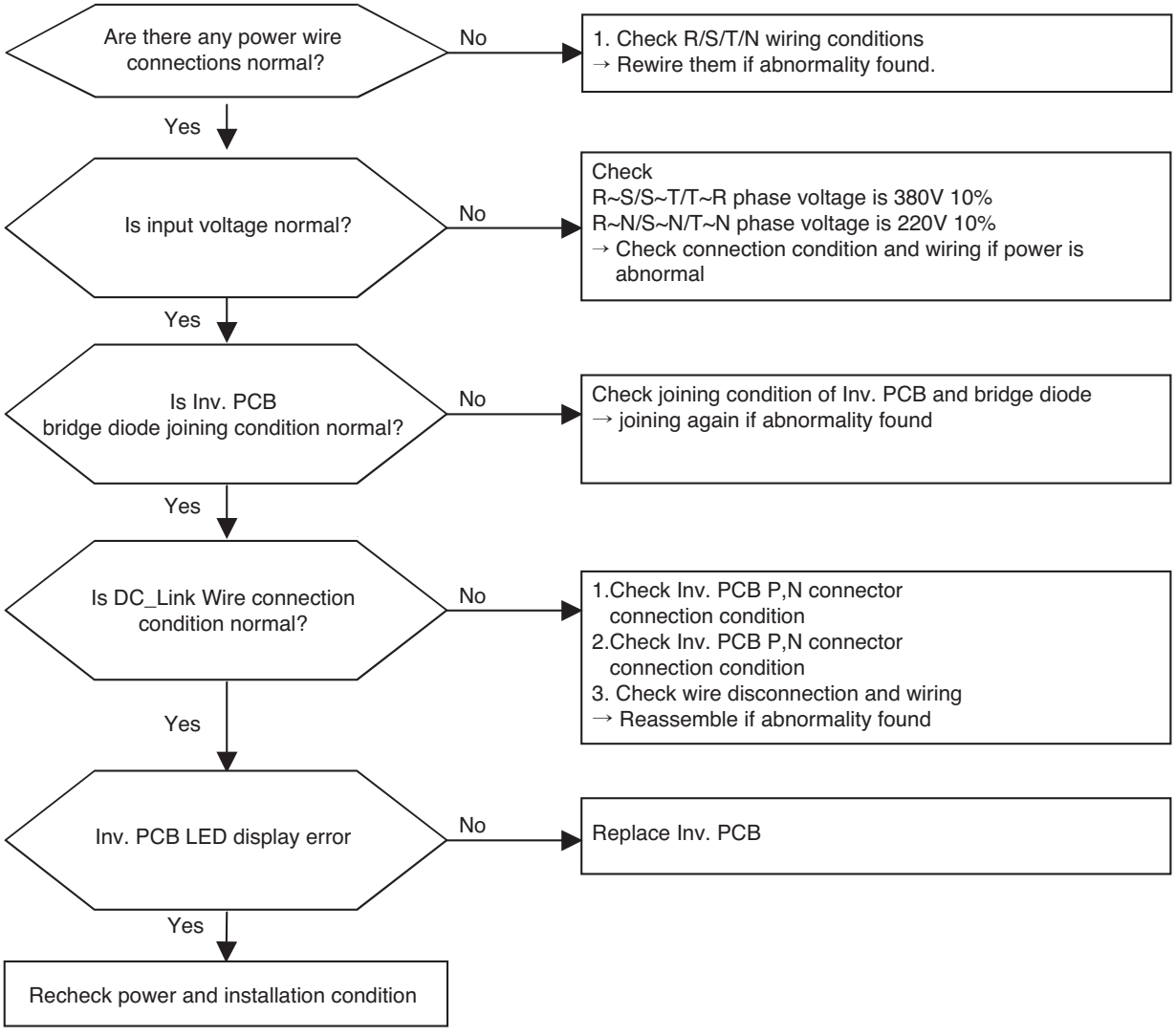


Note 1) High pressure switch connector on Main PCB

Note 2) Check short with high pressure switch connector

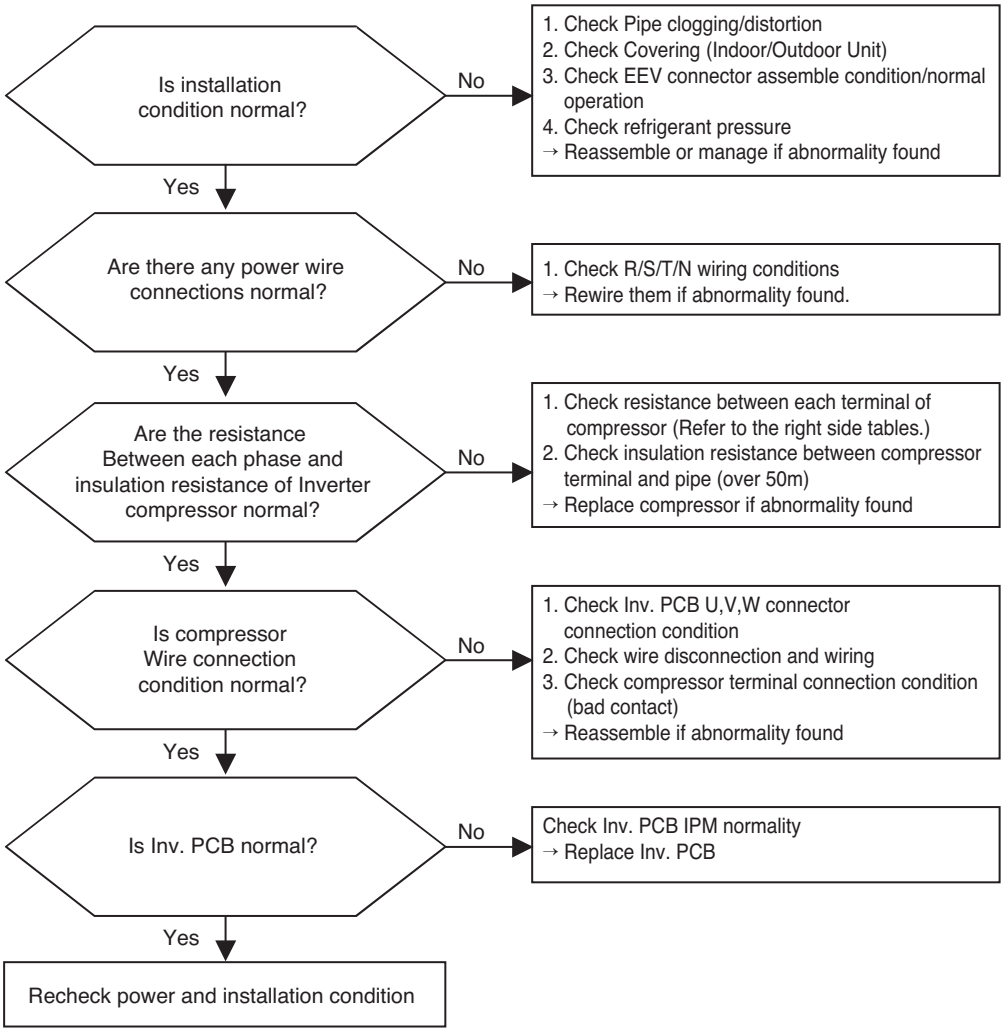
Error No.	Error Type	Error Point	Main Reasons
251	Input Voltage high/low	Input voltage is over limited value of the product (173V or less, 289V or more)	1. Input voltage abnormal (R-N) 2. Outdoor unit Inv. PCB damage (input voltage sensing part) 3. N phase line disconnection

■ Error Diagnosis and Countermeasure Flow Chart



Error No.	Error Type	Error Point	Main Reasons
261	Inverter compressor starting failure Error	Starting failure because of compressor abnormality	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage (Insulation damage/Motor damage) 3. Compressor wiring fault 4. Inv. PCB damage (CT)

■ Error Diagnosis and Countermeasure Flow Chart



JBA068MAF

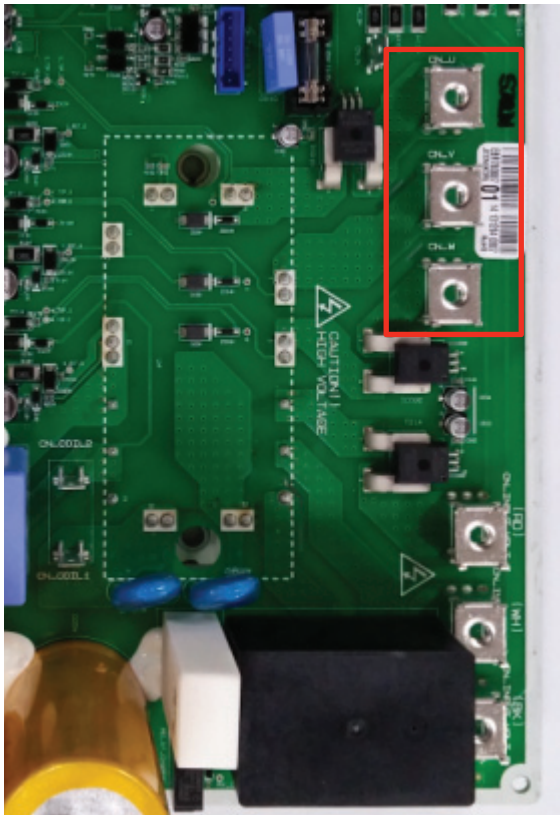
Temp	25°C	75°C
U-V	0.163 ± 7% Ω	0.195 ± 7% Ω
V-W	0.163 ± 7% Ω	0.195 ± 7% Ω
W-U	0.163 ± 7% Ω	0.195 ± 7% Ω

JQA048MAF

Temp	25°C	75°C
U-V	0.178 ± 7% Ω	0.212 ± 7% Ω
V-W	0.178 ± 7% Ω	0.212 ± 7% Ω
W-U	0.178 ± 7% Ω	0.212 ± 7% Ω

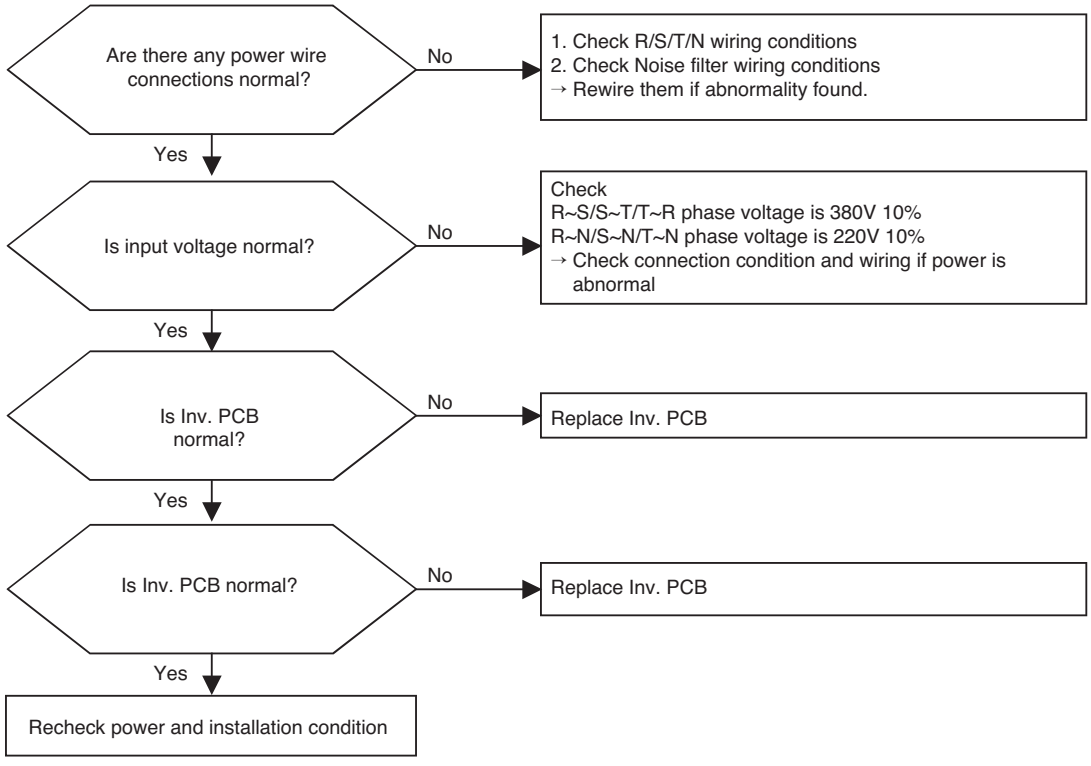
* Measuring resistance between each terminal of compressor

* Compressor wire connection



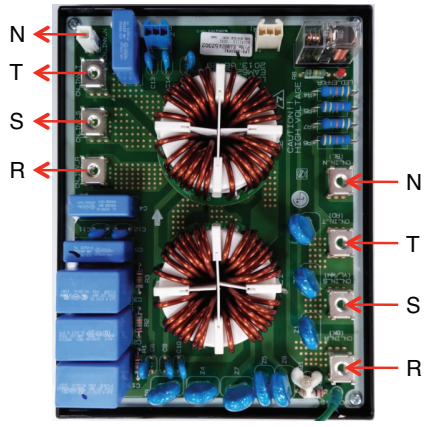
Error No.	Error Type	Error Point	Main Reasons
281	Inverter DC link high voltage error	Inv PCB DC link voltage supplied over 780V	1. Input voltage abnormal (R,S,T,N) 2. Inv. PCB damage (DC Link voltage sensing part)

■ Error Diagnosis and Countermeasure Flow Chart



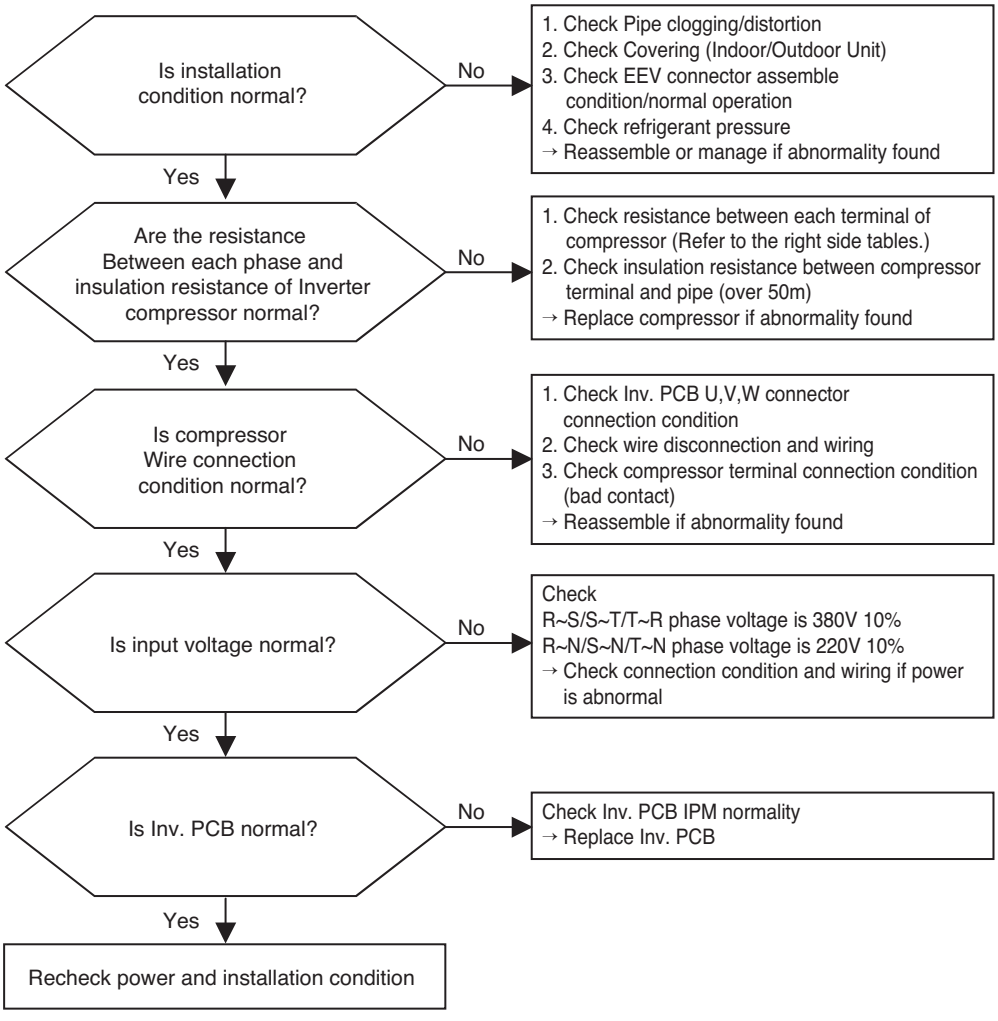
* Measuring input voltage

* Noise filter wiring



Error No.	Error Type	Error Point	Main Reasons
291	Inverter compressor over current	Inverter compressor input current is over 30A	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. Inv. PCB damage

■ Error Diagnosis and Countermeasure Flow Chart



JBA068MAF

Temp	25°C	75°C
U-V	0.163 ± 7% Ω	0.195 ± 7% Ω
V-W	0.163 ± 7% Ω	0.195 ± 7% Ω
W-U	0.163 ± 7% Ω	0.195 ± 7% Ω

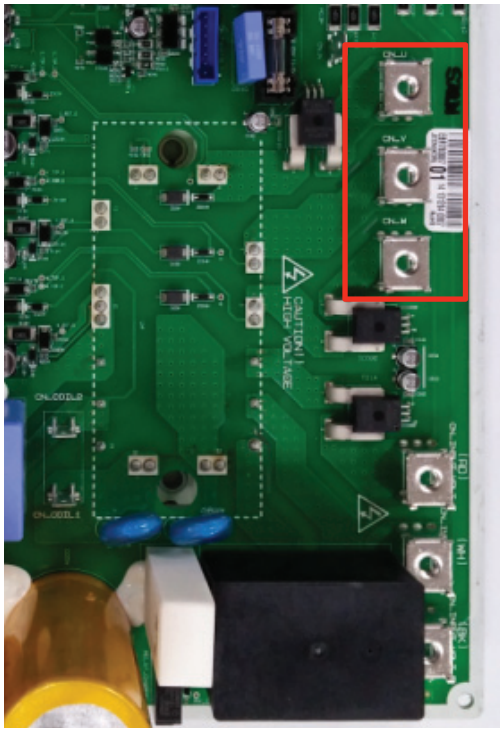
JQA048MAF

Temp	25°C	75°C
U-V	0.178 ± 7% Ω	0.212 ± 7% Ω
V-W	0.178 ± 7% Ω	0.212 ± 7% Ω
W-U	0.178 ± 7% Ω	0.212 ± 7% Ω

*** Measuring resistance between each terminal of compressor**

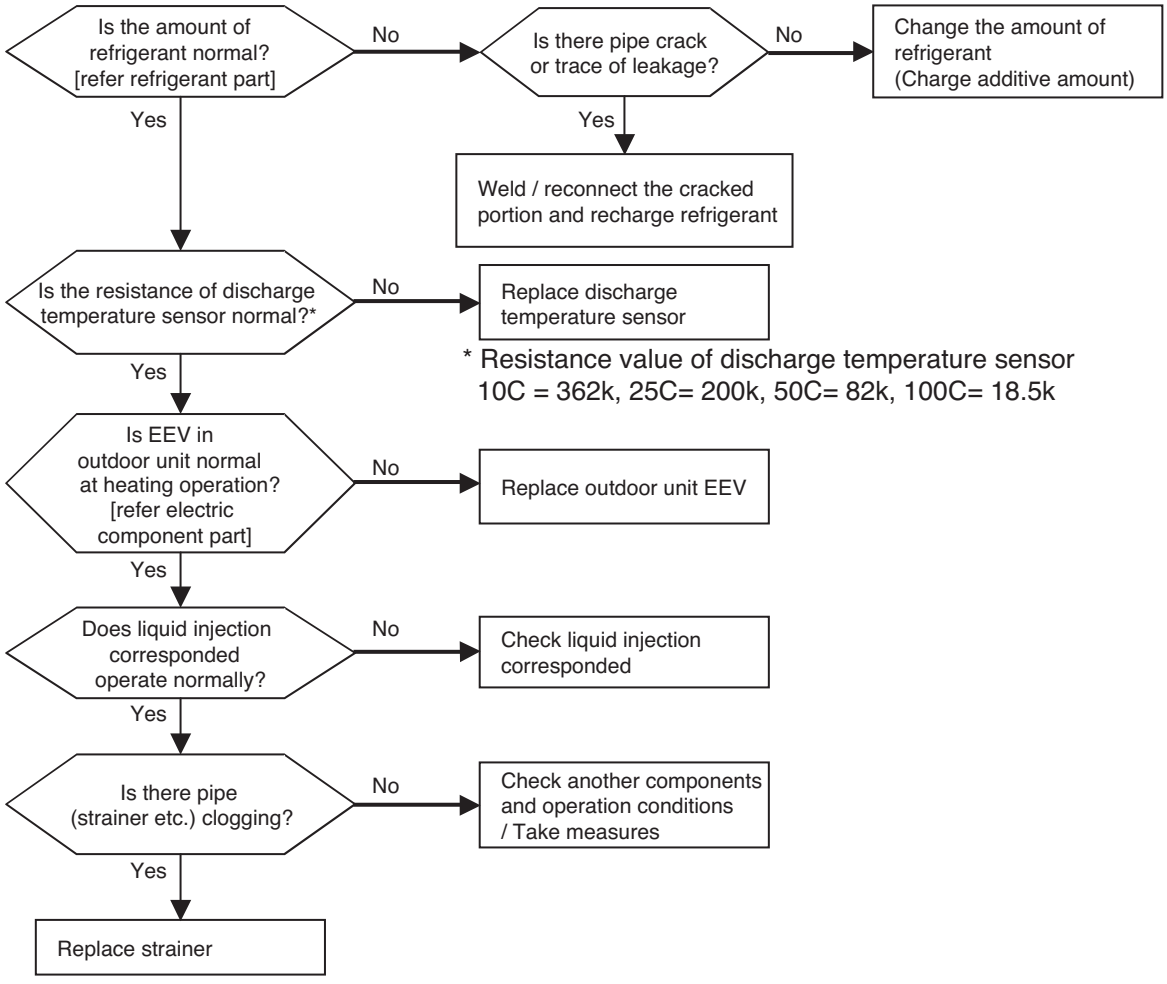
*** Measuring input voltage**

*** Compressor wire connection**



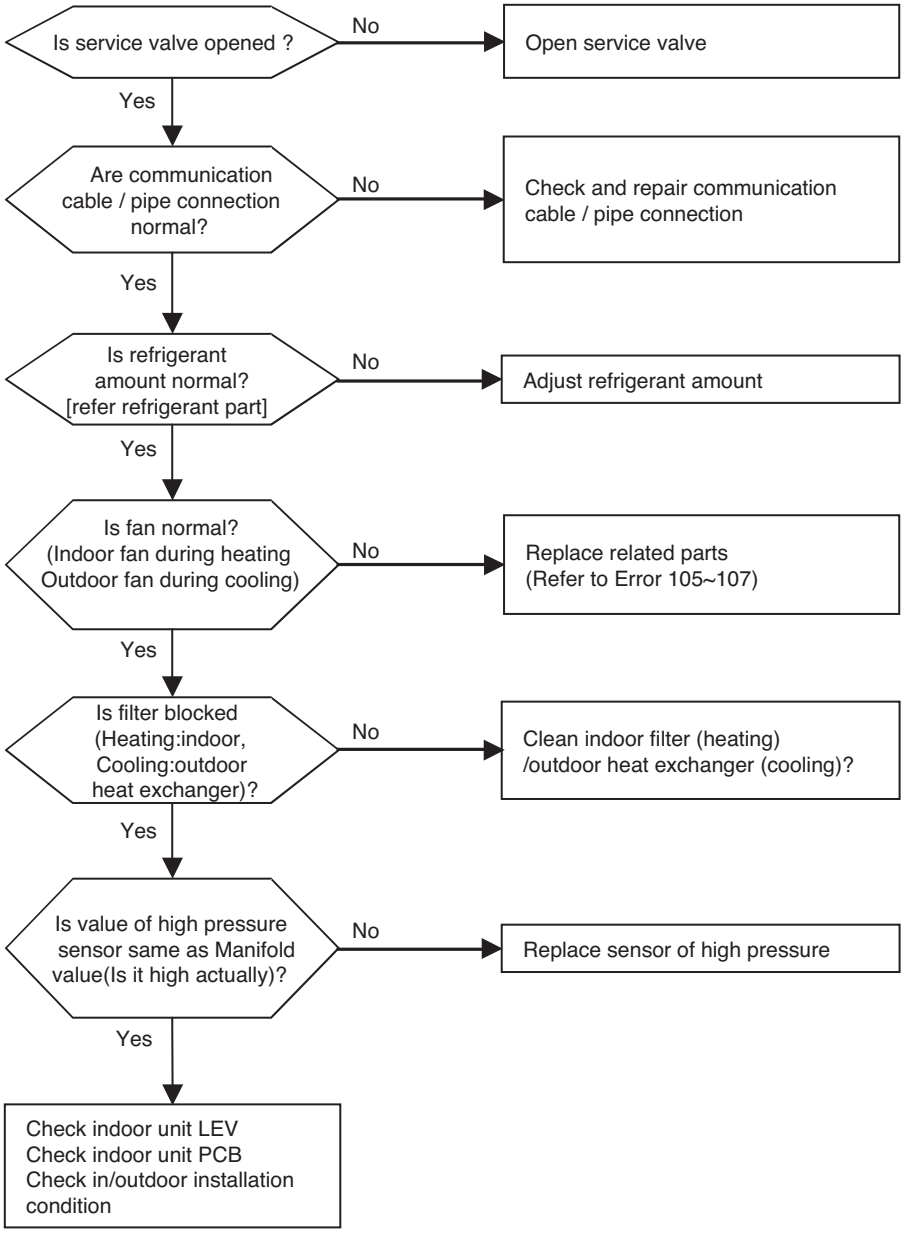
Error No.	Error Type	Error Point	Main Reasons
321	Over-increase discharge temperature of inverter compressor 1 at main outdoor unit	Compressor is off because of over-increase discharge temperature of inverter compressor 1	1. Temperature sensor defect of inverter compressor 1 discharge pipe 2. Refrigerant shortage / leak 3. EEV defect 4. Liquid injection valve defect

■ Error diagnosis and countermeasure flow chart



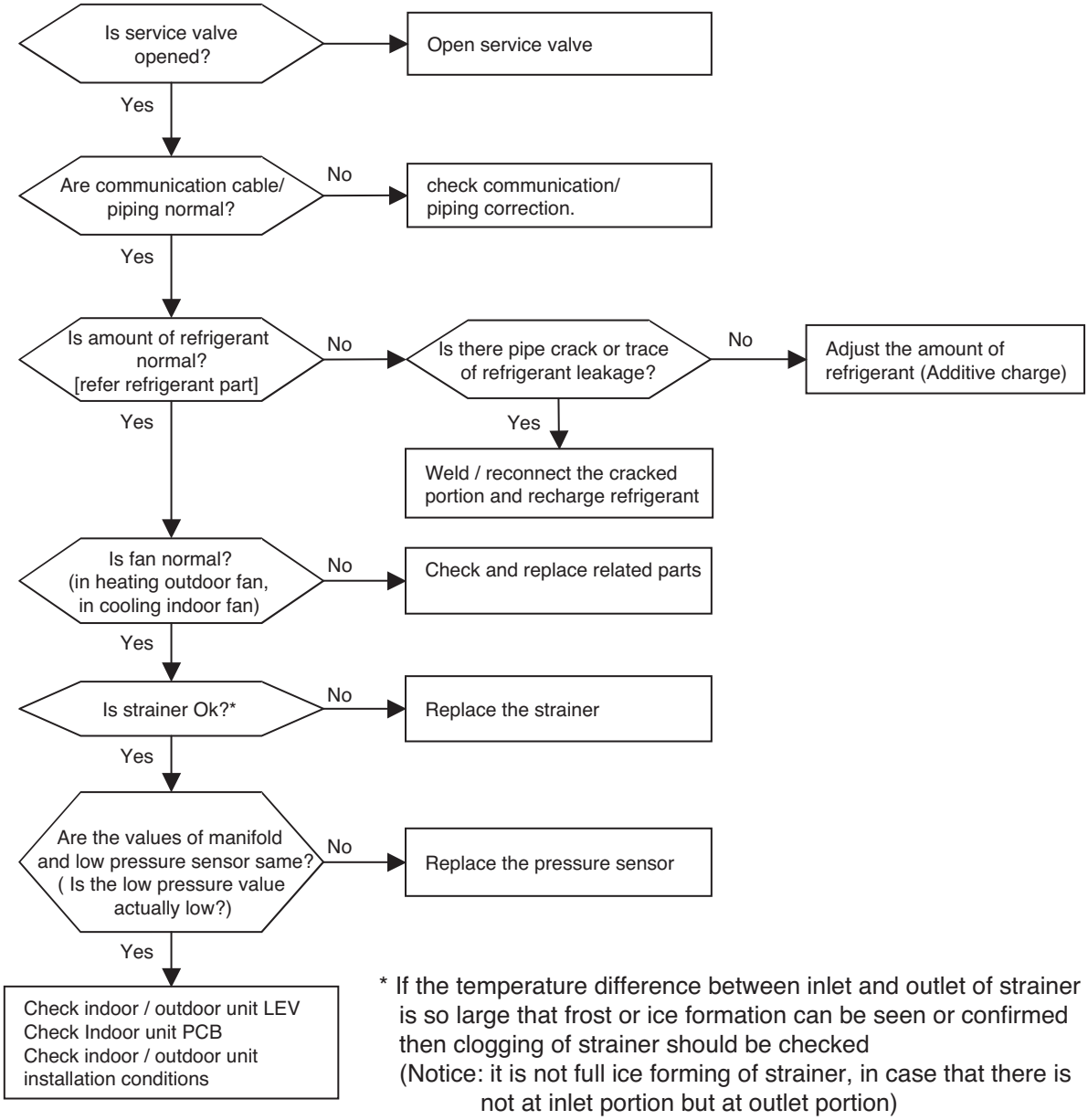
Error No.	Error Type	Error Point	Main Reasons
341	Over-increase of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to over-increase of high pressure by high pressure sensor	1. Defect of high pressure sensor 2. Defect of indoor or outdoor unit fan 3. Deformation because of damage of refrigerant pipe 4. Over-charged refrigerant 5. Defective indoor / outdoor unit EEV 6. When blocked - Outdoor unit is blocked during cooling - Indoor unit filter is blocked during heating 7. SVC valve is clogged 8. PCB defect of outdoor unit 10. Indoor unit pipe temperature sensor defect

■ Error diagnosis and countermeasure flow chart



Error No.	Error Type	Error Point	Main Reasons
351	Excessive drop of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to excessive drop of low pressure by the low pressure sensor	1. Defective low pressure sensor 2. Defective outdoor/indoor unit fan 3. Refrigerant shortage/leakage 4. Deformation because of damage of refrigerant pipe 5. Defective indoor / outdoor unit EEV 6. Covering / clogging (outdoor unit covering during the cooling mode/ indoor unit filter clogging during heating mode) 7. SVC valve clogging 8. Defective outdoor unit PCB 9. Defective indoor unit pipe sensor

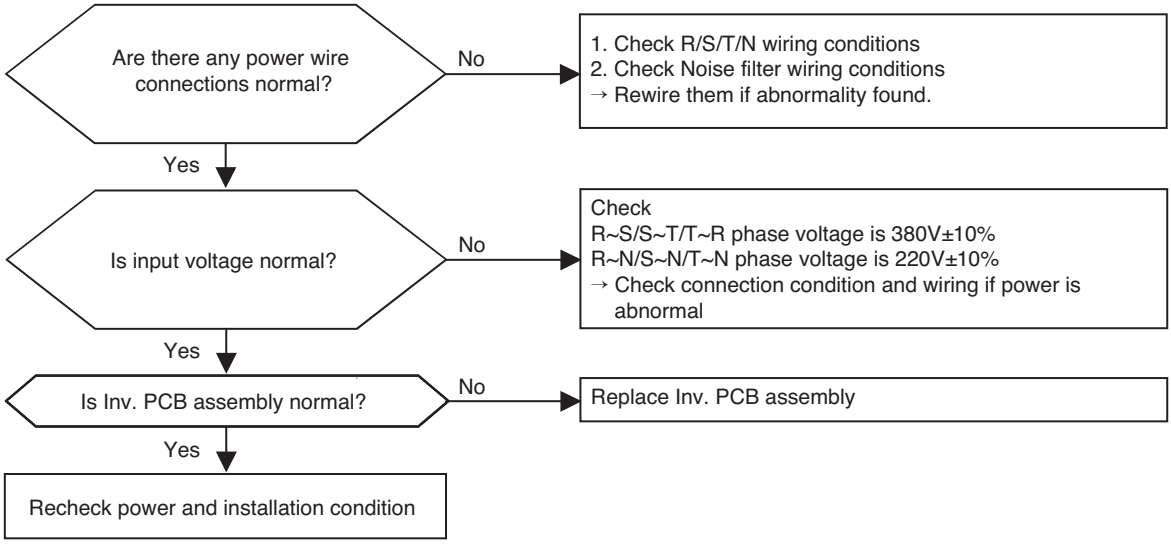
■ Error diagnosis and countermeasure flow chart



* If the temperature difference between inlet and outlet of strainer is so large that frost or ice formation can be seen or confirmed then clogging of strainer should be checked
(Notice: it is not full ice forming of strainer, in case that there is not at inlet portion but at outlet portion)

Error No.	Error Type	Error Point	Main Reasons
401	Inverter compressor CT sensor error	Micom input voltage isn't within 2.5V ±0.3V at initial state of power supply	1. Input voltage abnormal (T-N) 2. ODU Inv. PCB damage (CT sensing part)

■ Error Diagnosis and Countermeasure Flow Chart

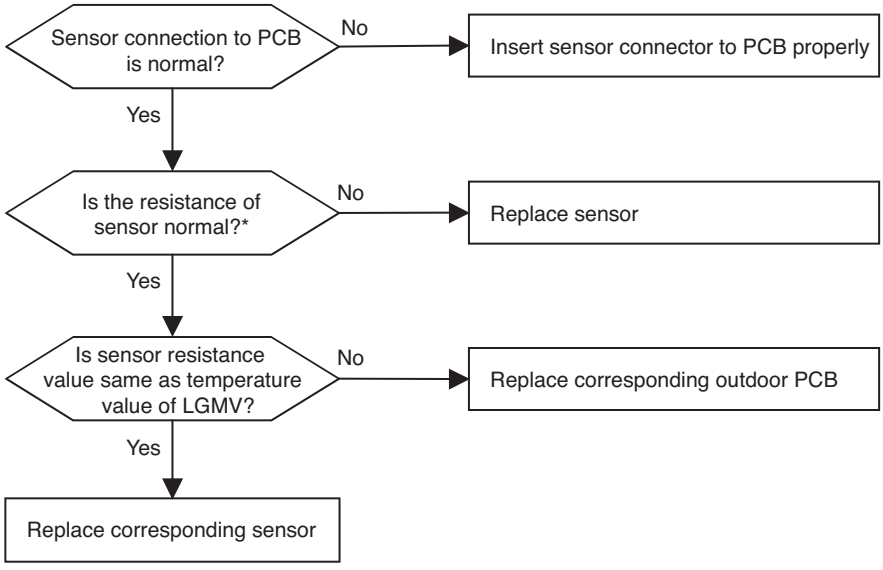


* Measuring input voltage

* Inv. PCB assembly

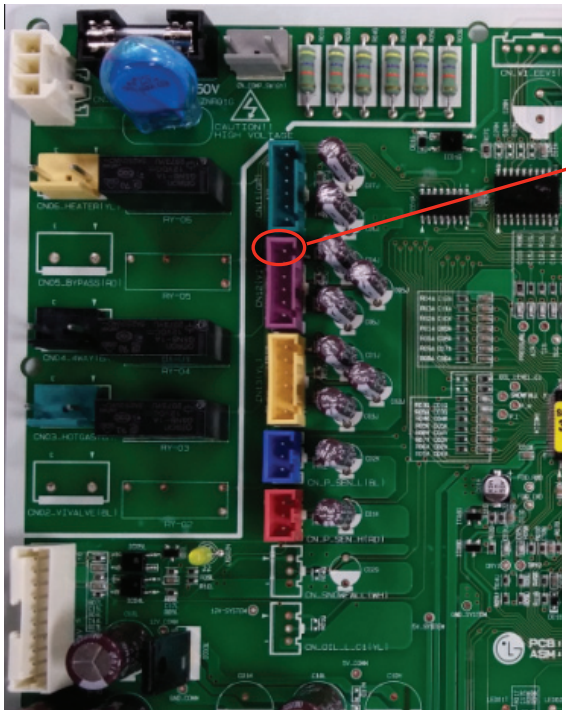
Error No.	Error Type	Error Point	Main Reasons
411	Compressor1 discharge pipe temperature sensor error	Sensor measurement value is abnormal (Open/Short)	1. Defective connection of the compressor1 discharge pipe temperature sensor 2. Defective discharge pipe compressor sensor of the compressor1 (open/short) 3. Defective outdoor PCB

■ Error diagnosis and countermeasure flow chart



* Error is generated if the resistance is more than 5M(open) and less than 2k (short)

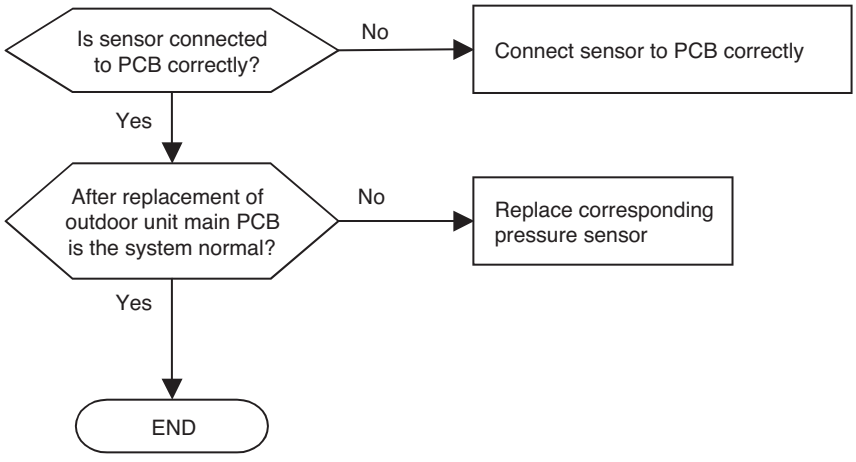
Note: Standard values of resistance of sensors at different temperatures (5% variation)
10C = 362k : 25C= 200k : 50C= 82k : 100C= 18.5k

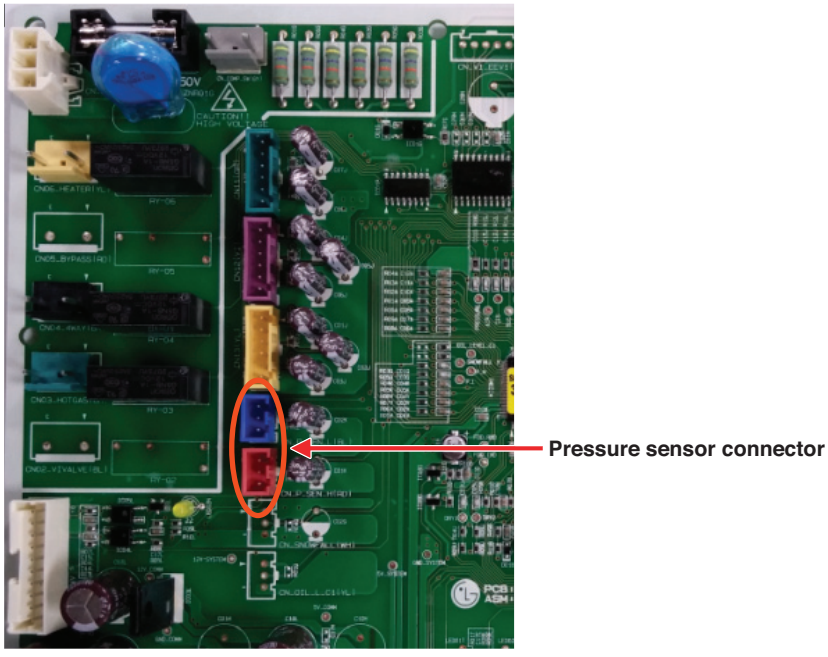


Check the resistance inverter compressor discharge temperature sensor

Error No.	Error Type	Error Point	Main Reasons
421	Sensor error of low pressure	Abnormal value of sensor (Open/Short)	1. Bad connection of low pressure connector 2. Defect of low pressure connector (Open/Short) 3. Defect of outdoor PCB
431	Sensor error of high pressure	Abnormal value of sensor (Open/Short)	1. Bad connection of high pressure connector 2. Defect of high pressure connector (Open/Short) 3. Defect of outdoor PCB

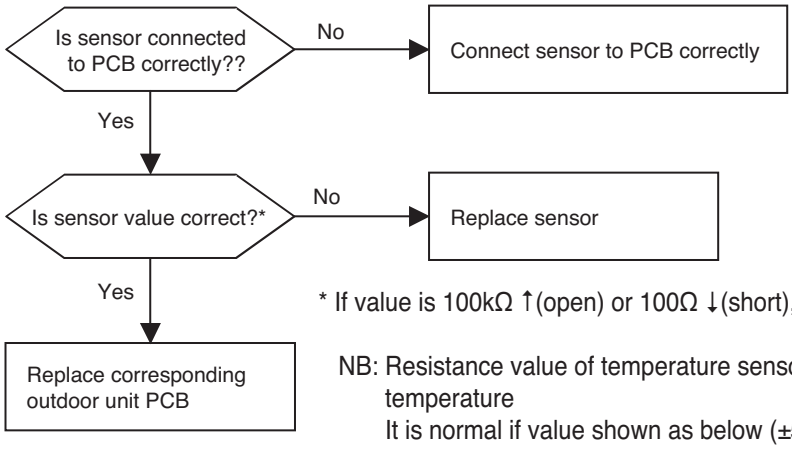
■ Error diagnosis and countermeasure flow chart





Error No.	Error Type	Error Point	Main Reasons
441	Sensor error of outdoor air temperature	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB
451	Piping temperature sensor error of heat exchanger in master & slave outdoor unit heat exchanger (A,B)	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB
461	Compressor suction temperature sensor error	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB

■ Error diagnosis and countermeasure flow chart

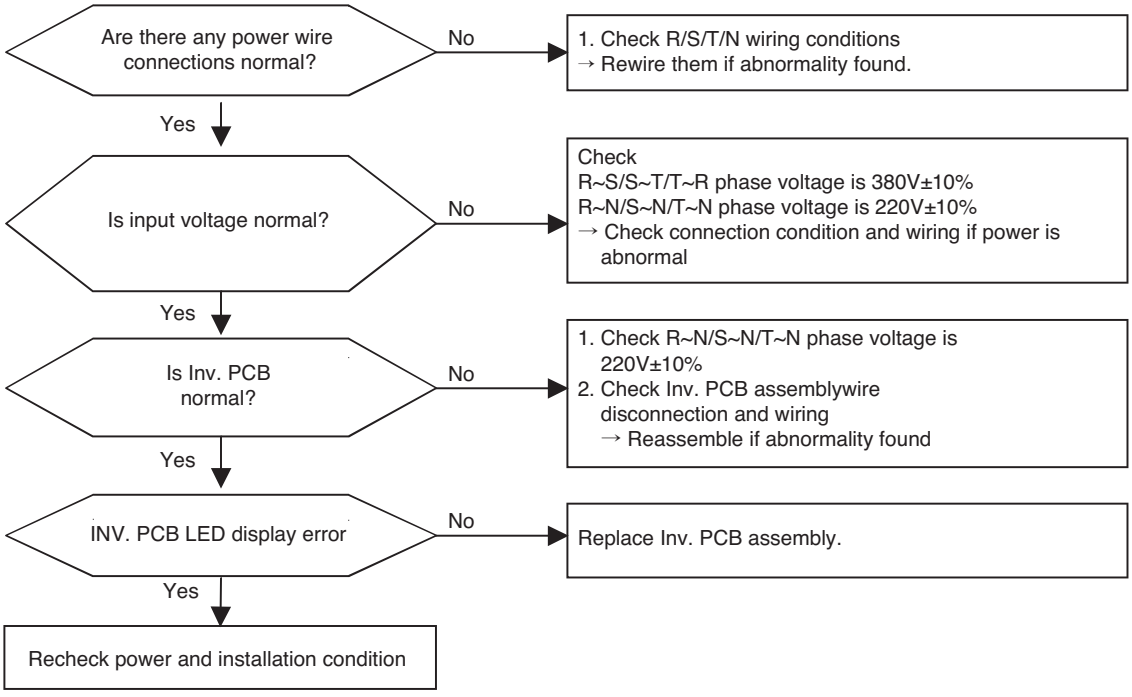


* If value is 100kΩ ↑(open) or 100Ω ↓(short), error occurs

NB: Resistance value of temperature sensor change according to temperature
It is normal if value shown as below (±5% error)
Sensor of air temperature: 10°C = 20.7kΩ : 25°C= 10kΩ : 50°C= 3.4kΩ
Sensor of piping temperature: 10°C = 10kΩ : 25°C= 5Ωk : 50°C= 1.8kΩ

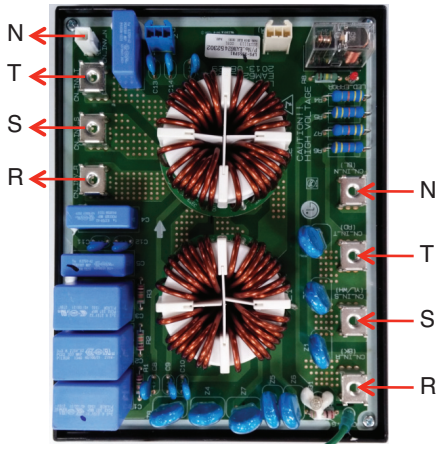
Error No.	Error Type	Error Point	Main Reasons
501	ODU 3phase power omission error	Omitting one or more of R,S,T input power	1. Input Voltage abnormal (R,S,T,N) 2. Check power Line connection condition 3. Inv. PCB damage 4. Inv. PCB input current sensor fault

■ Error Diagnosis and Countermeasure Flow Chart

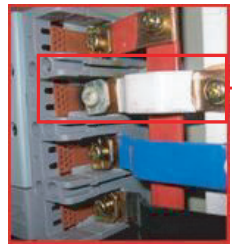


* Measuring input voltage

* Noise filter wiring



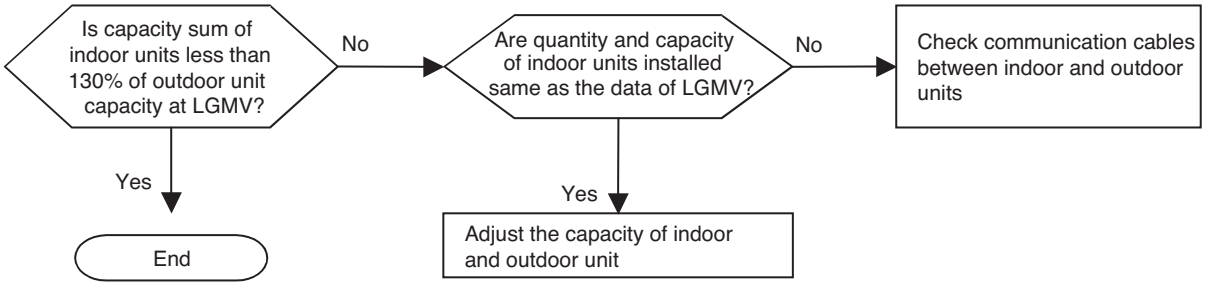
* Field Fault Case



* R-Phase Terminal Changed Color.

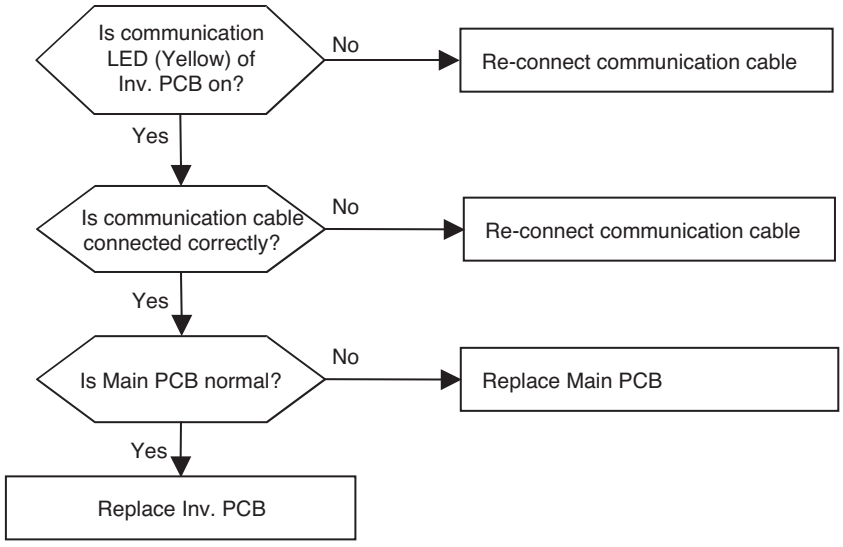
Error No.	Error Type	Error Point	Main Reasons
511	Over-Capacity (Sum of indoor unit capacity is more than outdoor capacity)	Sum of indoor unit capacity exceed outdoor unit capacity specification	1. 130% more than outdoor unit rated capacity 2. Wrong connection of transmission cable/piping 3. Detect ot outdoor unit PCB

■ Error diagnosis and countermeasure flow chart

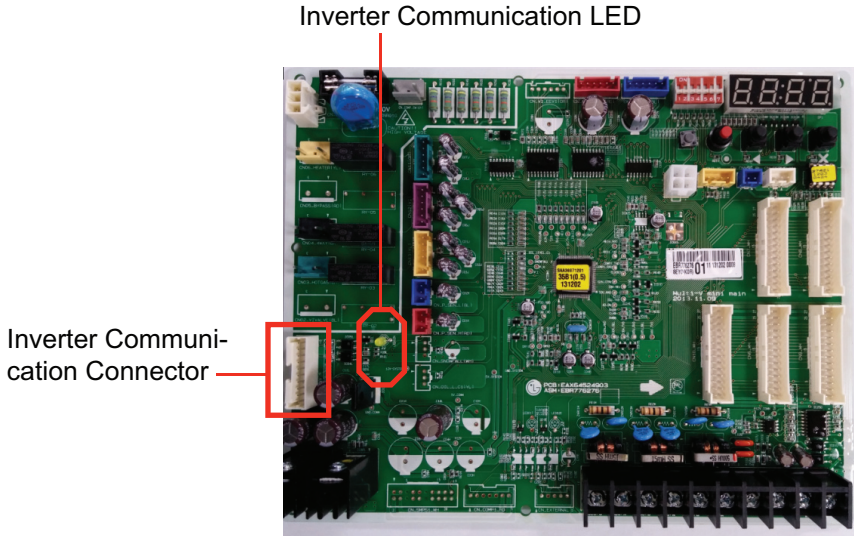


Error No.	Error Type	Error Point	Main Reasons
521	Communication error between (Inv. PCB ➔ Main PCB)	Main PCB of Master unit of Master unit can't receive signal from Inv. PCB	1. Power cable or communication cable is not connected 2. Defect of outdoor Main PCB or Inv. PCB

■ Error diagnosis and countermeasure flow chart

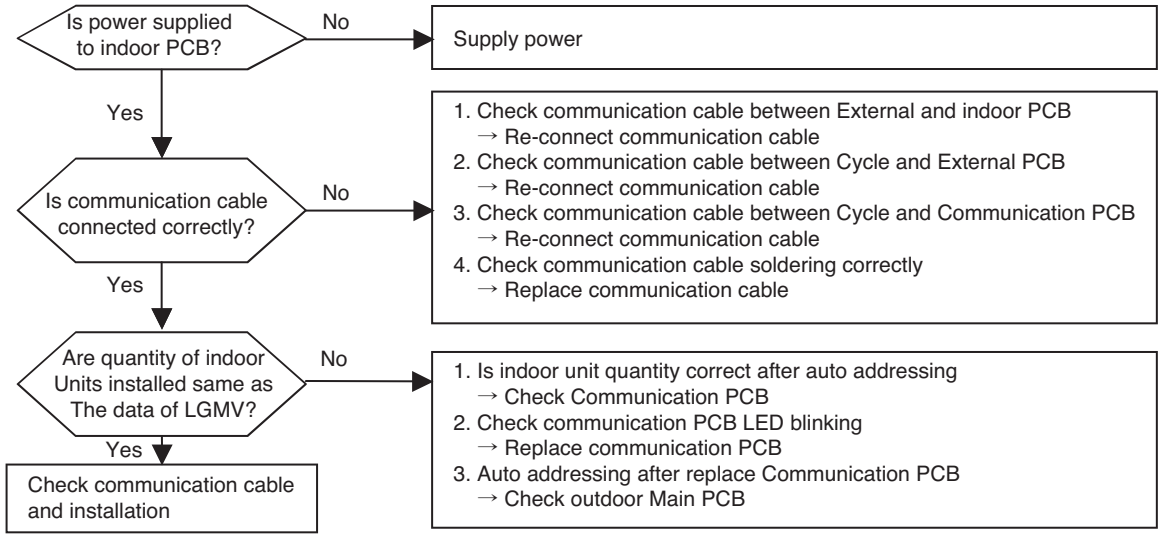


* The method of checking Main PCB and Inv. PCB (If normal, communication LED blinks)



Error No.	Error Type	Error Point	Main Reasons
531	Communication error (Indoor unit ➔ Main PCB)	In case Main PCB can't receive signal from indoor unit	1. Communication cables are not connected between External PCB and indoor PCB 2. Communication cables are not connected between Main PCB and External PCB 3. Communication cables are not connected between Main PCB and Communication PCB 4. Communication cables are short/open 5. Indoor PCB power off 6. Defect of outdoor Cycle/Communication/indoor PCB 7. Communication wire connection fault

■ Error diagnosis and countermeasure flow chart

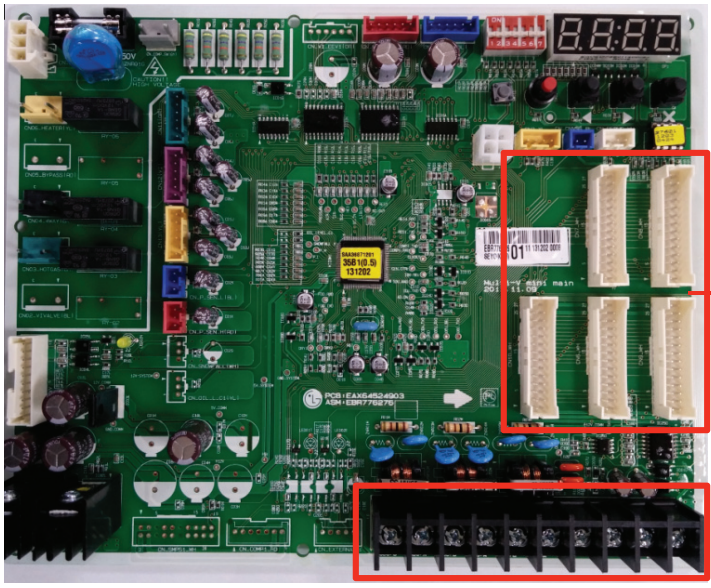


In case of CH53, almost happened with CH05, the indoor units not operated actually are normal so check with same method of CH05. and additionally check as shown as below and above flow chart

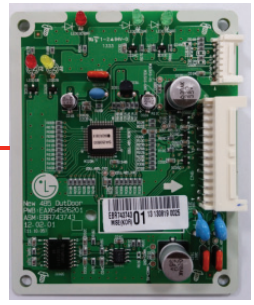
- Although the quantity of indoor units installed is same as LGMV data there may be a few indoor units with which the number of communication is not increased with LGMV
- Although the quantity of indoor units installed is not same as LGMV data, and if communication of the indoor unit displayed at LGMV is done well then the indoor unit suspected to have some problem (and is not appear at LGMV) may have following problems
  ① wrong connection of communication cable or power cable
  ② fault of power / PCB / communication cable
  ③ duplication of indoor unit number
- If communication is not doing well wholly then the Auto Addressing is not done
- The case that CH53 appear at indoor unit also Auto Addressing is not done so indoor unit address may be duplicated

* After replacement of indoor unit PCB, Auto Addressing should be done, if central controller is installed then the central control address also should be input.
  In case that only communication PCB is replaced above process is not needed

Communication Part in Main PCB



Indoor Unit
Communication PCB

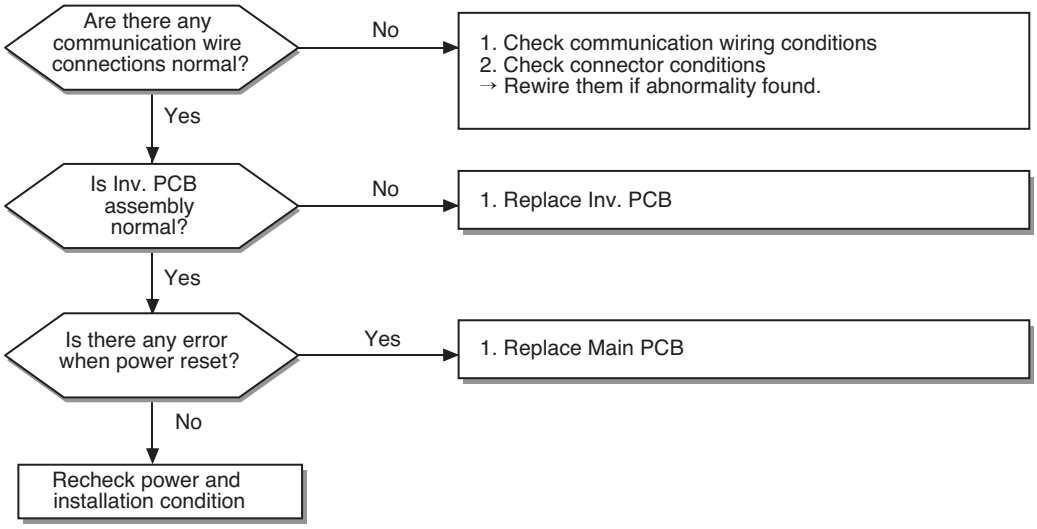


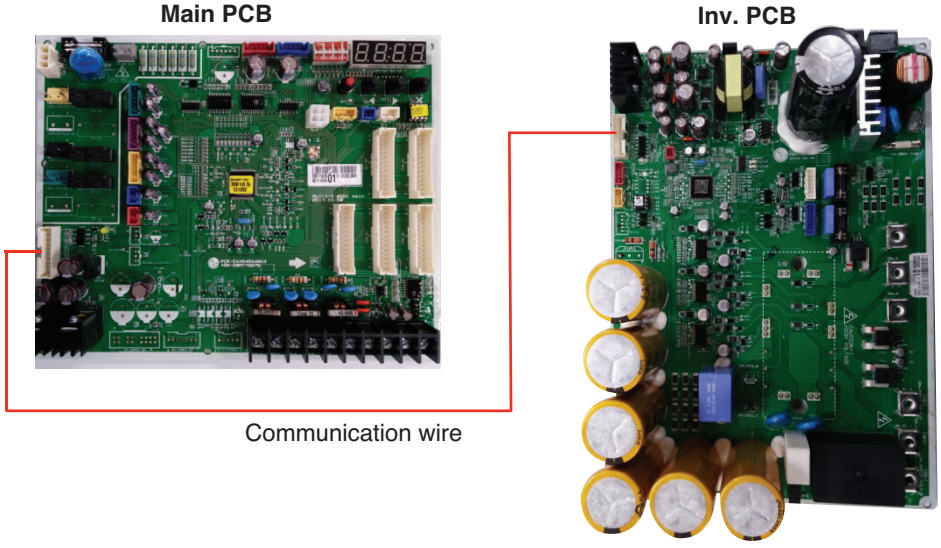
❉ Remark : IDU A/IDU B

Wiring Fault Case

Error No.	Error Type	Error Point	Main Reasons
571	Communication error : Main PCB --> Inv. PCB	Failing to receive inverter signal at main PCB of Outdoor Unit	1. Bad Connection Between Main PCB and Inv. PCB 2. Communication Wire Noise Effect 3. ODU Main PCB Damage

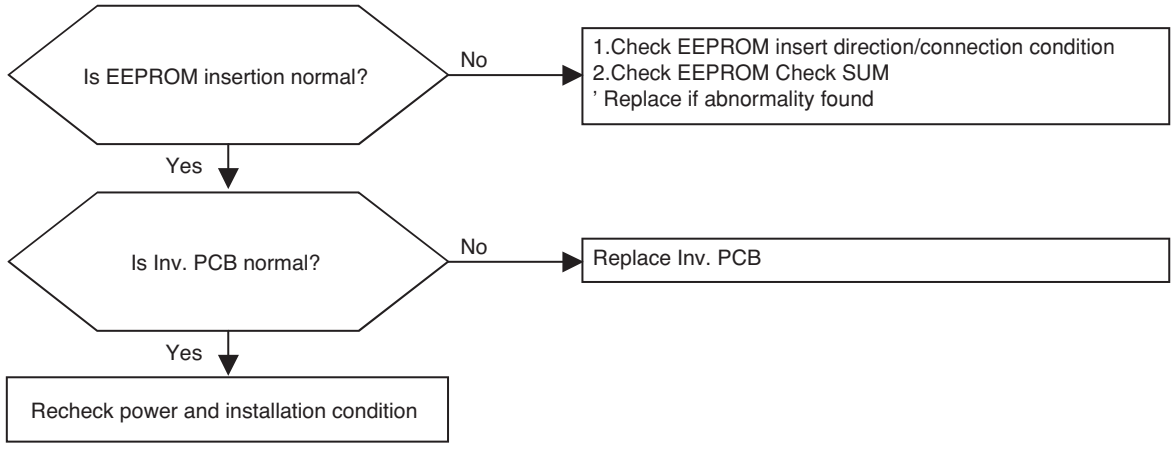
■ Error diagnosis and countermeasure flow chart



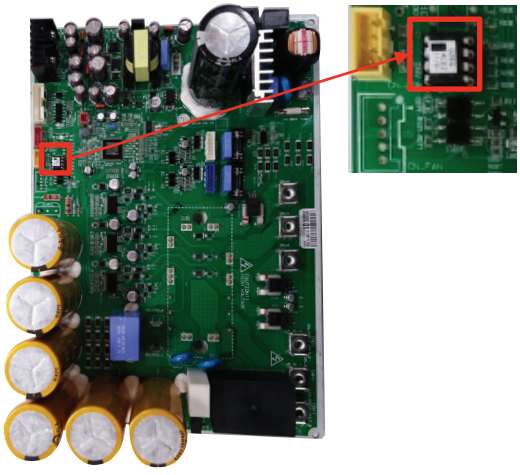


Error No.	Error Type	Error Point	Main Reasons
601	Inv. PCB EEPROM error	EEPROM Access error and Check SUM error	1. EEPROM contact defect/wrong insertion 2. Different EEPROM Version 3. ODU Inv. PCB assembly damage

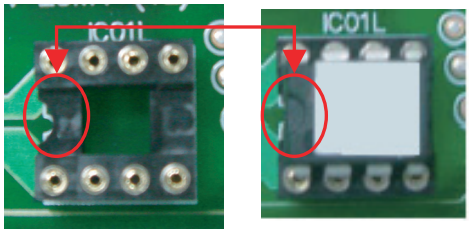
■ Error Diagnosis and Countermeasure Flow Chart



* Inv. EEPROM inserting point



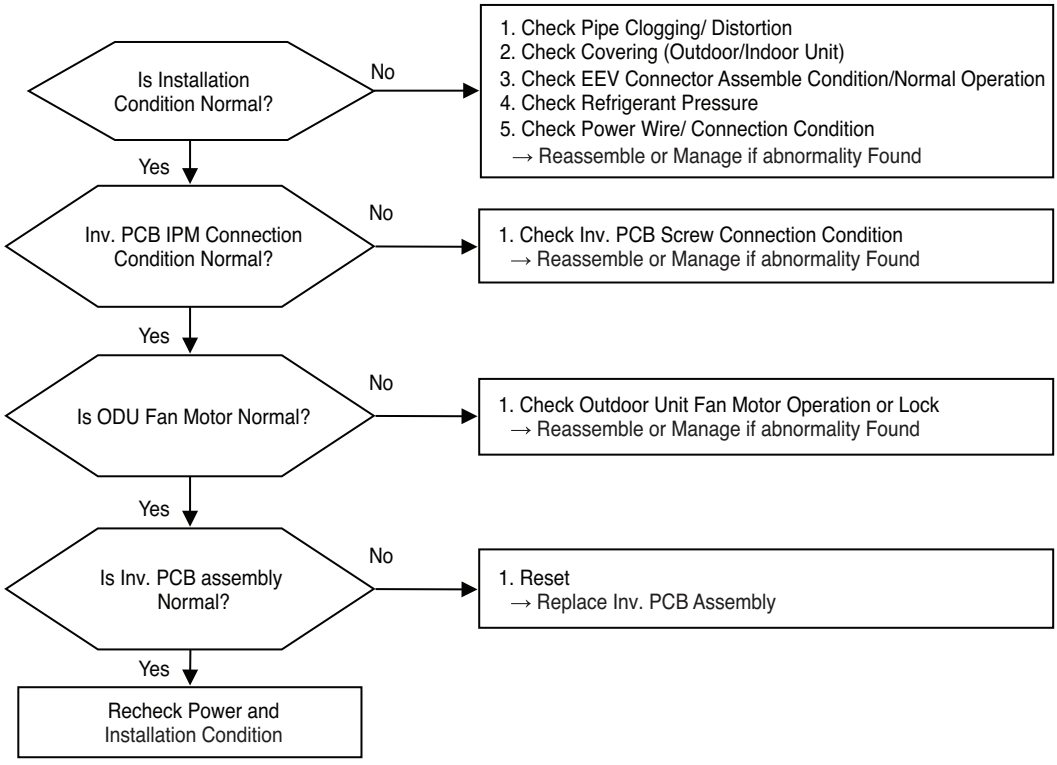
* Right inserting direction of Inv. EEPROM



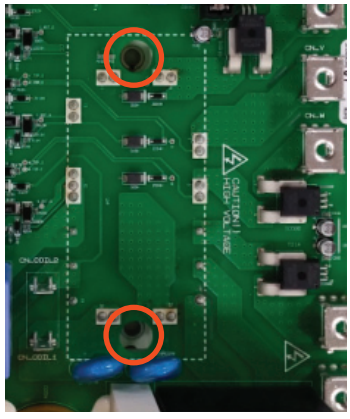
※ Note : Replace after power off

Error No.	Error Type	Error Point	Main Reasons
621	Inv. PCB Heatsink Temperature High	Heatsink Temperature is Over 90°C	1. Inv. PCB IPM Connection Condition Abnormal 2. Outdoor Unit Fan Motor Operation Abnormal 3. Outdoor Unit Inv. PCB Assembly Defect 4. Overload Operation (Pipe Clogging/ Covering/EEV Defect/Ref. Overcharge)

■ Error diagnosis and countermeasure flow chart



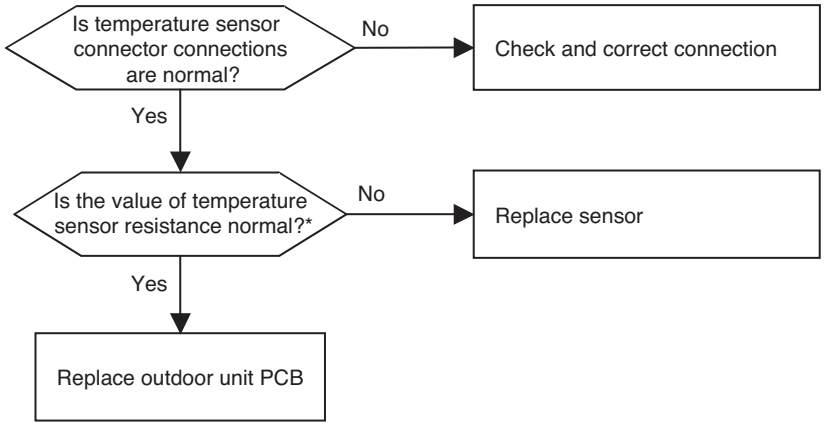
■ Check Inv. PCB Screw Connection Condition



Check Screw Connection Condition

Error No.	Error Type	Error Point	Main Reasons
651	Outdoor unit liquid pipe (condenser) temperature sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open / Short) 3. Defective outdoor unit PCB

■ Error diagnosis and countermeasure flow chart

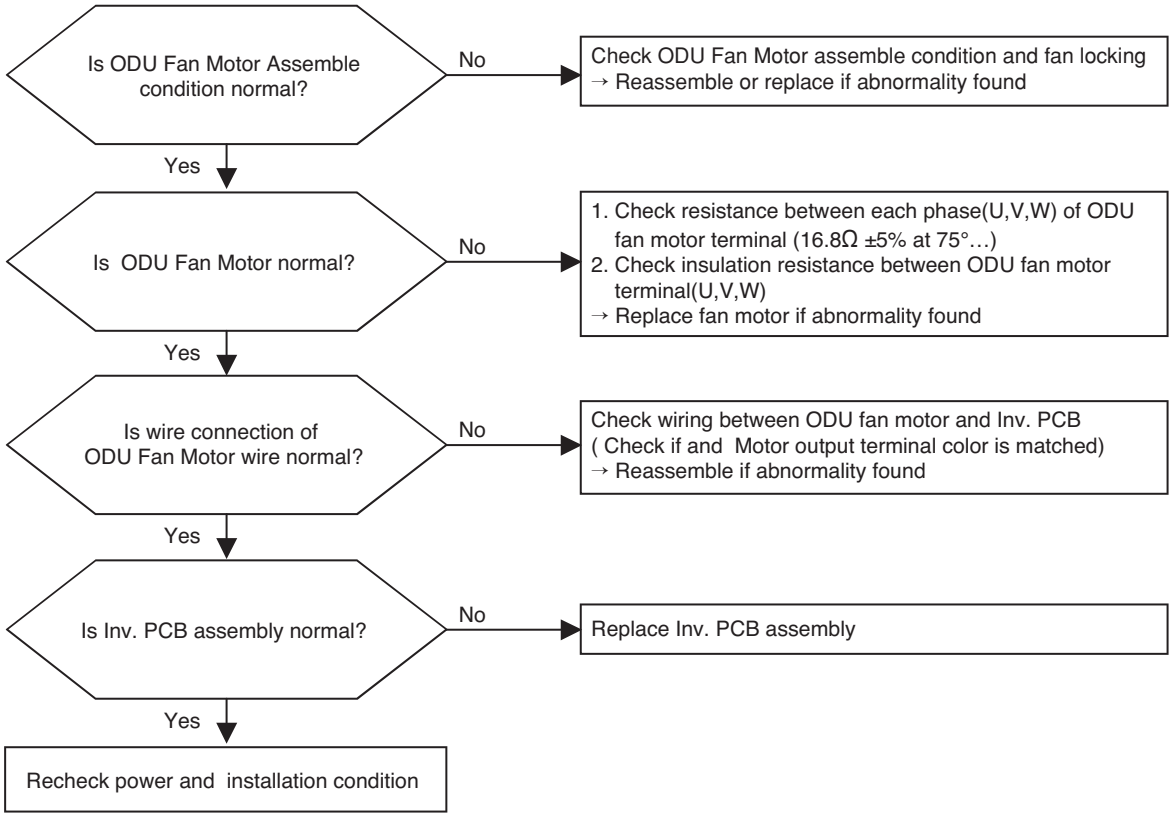


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

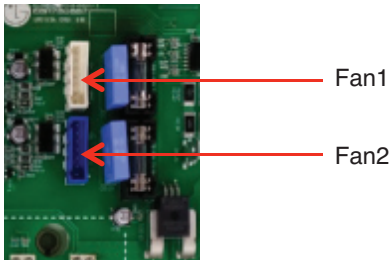
Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10°C = 20.7kΩ : 25°C = 10kΩ : 50°C= 3.4kΩ
Pipe temperature sensor: 10°C = 10kΩ : 25°C = 5kΩ : 50°C= 1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
671	Fan Lock Error	Fan RPM is 10RPM or less for 5 sec. when ODU fan starts or 40 RPM or less after fan starting.	1. Fan motor defect / assembly condition abnormal 2. Wrong connection of fan motor connector 3. Reversing rotation after RPM target apply 4. Inv. PCB assembly defect 5. Fan lock by Heavy Snowfall.

■ Error Diagnosis and Countermeasure Flow Chart

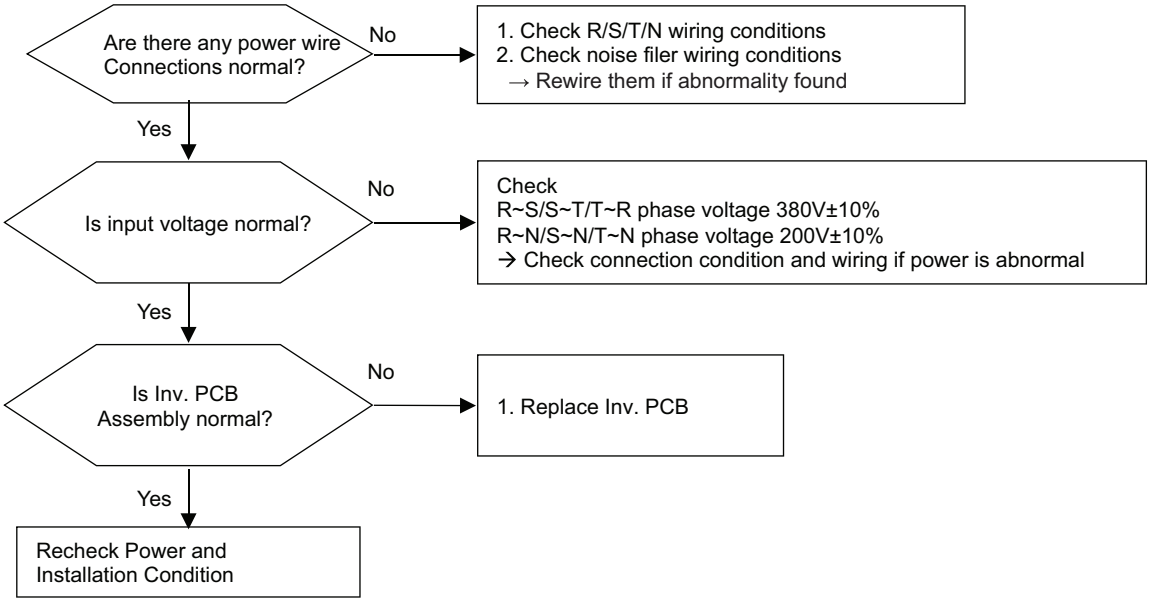


* Inv. PCB



Error No.	Error Type	Error Point	Main Reasons
711	Inv. CT Sensor Error	Micom input voltage isn't within 2.5V±0.3V at initial state of power supply	1. Input Voltage is abnormal (T-N) 2. ODU Inv. PCB damage (CT sensing part)

■ Error diagnosis and countermeasure flow chart

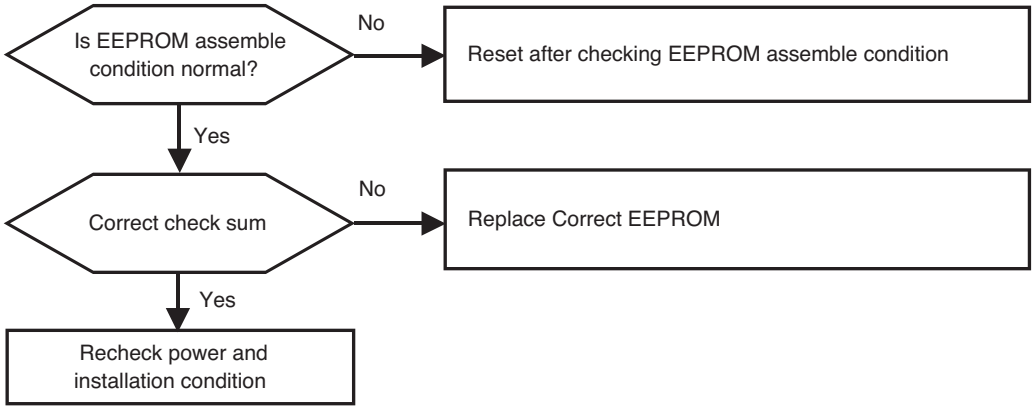


*** Measuring input voltage**

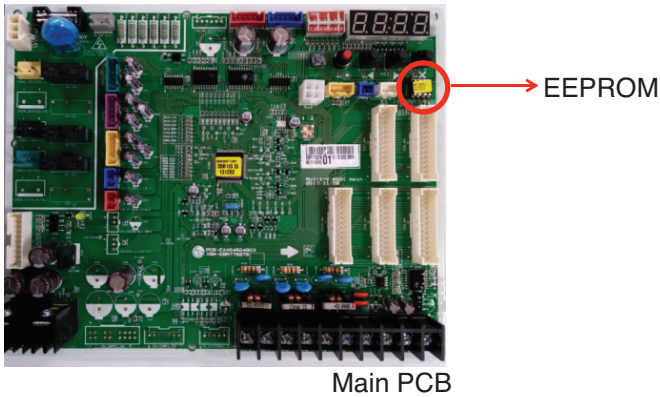
*** Inv. PCB assembly**

Error No.	Error Type	Error Point	Main Reasons
861	Main PCB EEPROM	EEPROM Access Error	1. No EEPROM 2. EEPROM wrong insertion

■ Error Diagnosis and Countermeasure Flow Chart

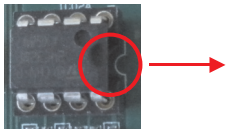


EEPROM Insertion



Main PCB

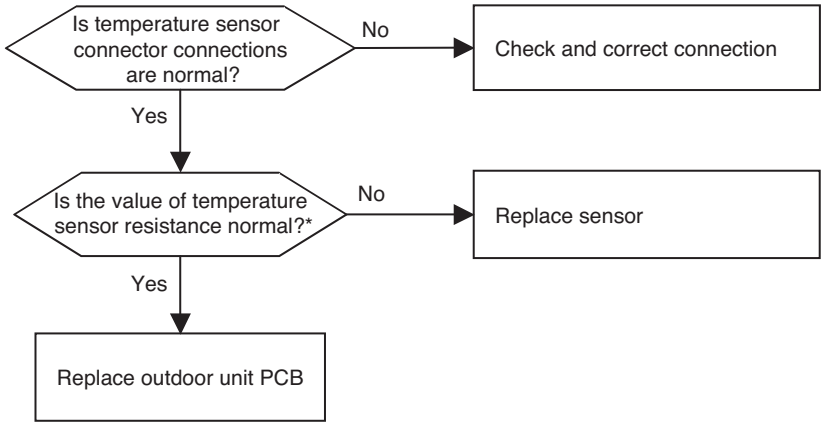
* Note : Replace after power off



Same direction both socket hole and EEPROM hole

Error No.	Error Type	Error Point	Main Reasons
1131	Outdoor unit liquid pipe (condenser) temperature sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open / Short) 3. Defective outdoor unit PCB
1151	Outdoor Unit Subcooling Outlet Temperature Sensor Error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open/Short) 3. Defective outdoor PCB

■ Error diagnosis and countermeasure flow chart

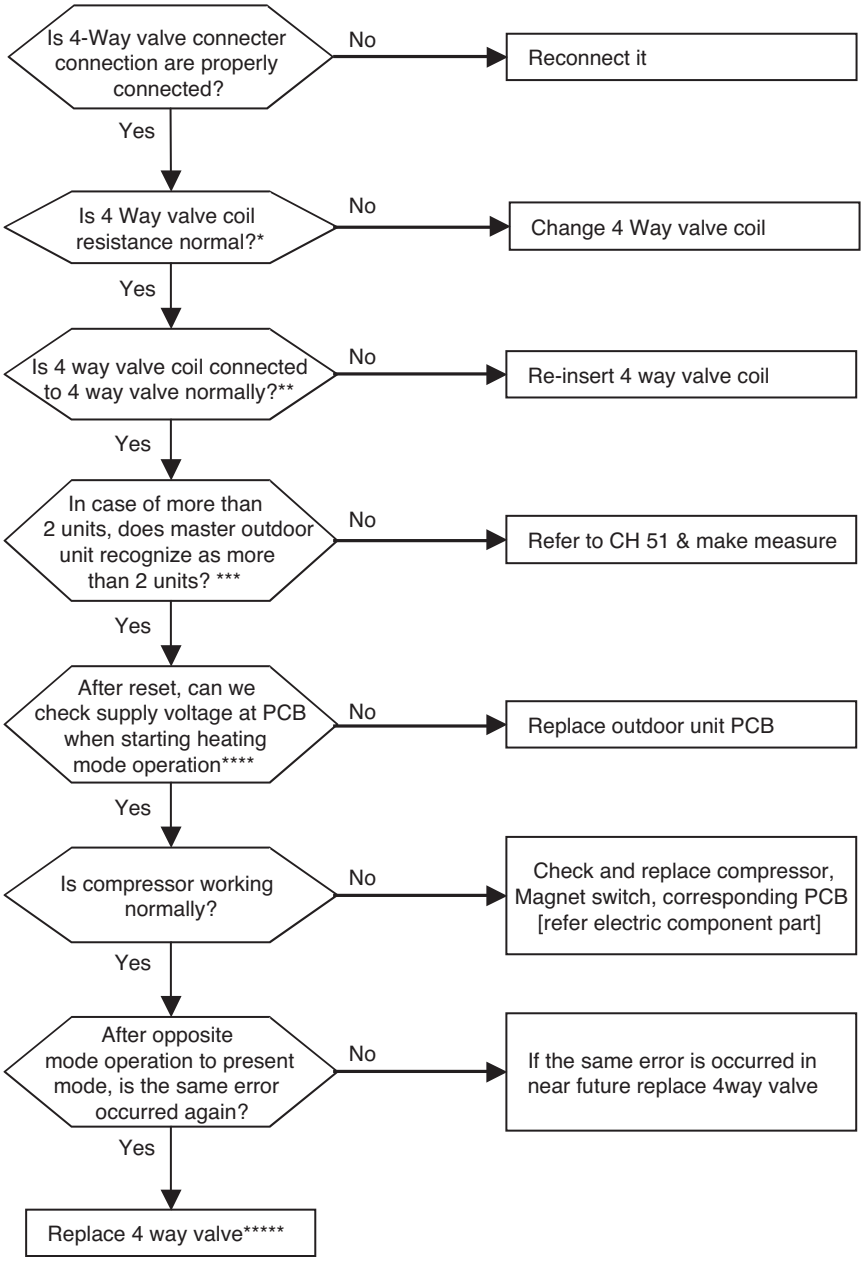


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

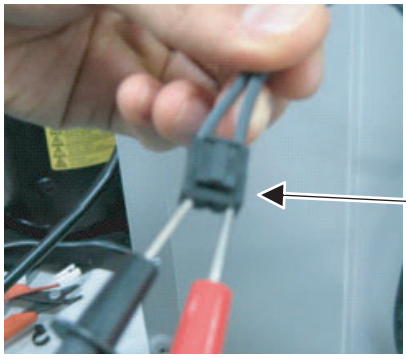
Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10°C = 20.7kΩ : 25°C = 10kΩ : 50°C= 3.4kΩ
Pipe temperature sensor: 10°C = 10kΩ : 25°C = 5kΩ : 50°C= 1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
1511	Function error of outdoor 4way (reversing valve)	Function error of 4way (reversing valve) in Main or Slave outdoor units	1. Wrong operation of 4way valve because of sludge etc. inflow 2. No pressure difference because of compressor fault 3. Wrong installation of In/outdoor common pipe 4. Defect of 4way valve

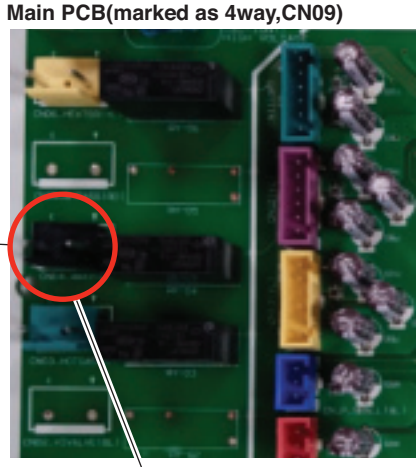
■ Error diagnosis and countermeasure flow chart



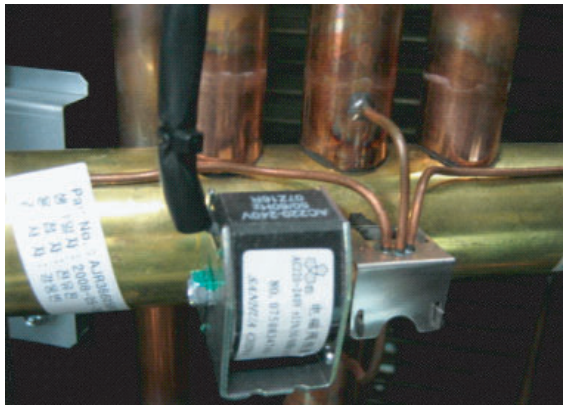
* Measure the resistance of 4way valve



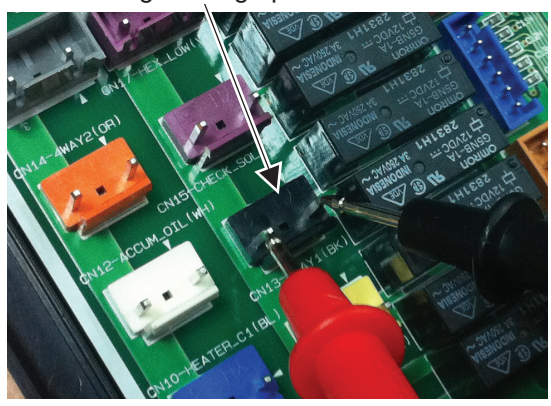
Location of 4way valve connector on Main PCB(marked as 4way,CN09)



** Confirm the 4way valve coil is inserted to the end



**** Check the output voltage of terminal socket during heating operation

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