Internal Use Only

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MULTI V™ WATER IV

Outside Unit R410A

SERVICE MANUAL

CAUTION

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

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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 Outside 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 cord.

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

Use a dedicated outlet 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 Outside 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 electro-static 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 Outside 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 Outside unit, suspending it at the specified positions on the unit base. Also support the Outside 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 plugged in.

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

Part 1
General Information

General Information

1. Model Names

1.1 Indoor Unit

Category		Chassis Name	Capacity[Btu/h(kW)]														
			5.5 (1.6)	7.5 (2.2)	9.6 (2.8)	12.3 (3.6)	15.4 (4.5)	19.1 (5.6)	24.2 (7.1)	28.0 (8.2)	30.0 (8.8)	36.2 (10.6)	42.0 (12.3)	48.1 (14.1)	54.0 (15.8)	76.4 (22.4)	96.5 (28.0)
Wall Mounted (General)		SE		ARNU07 3SE*2	ARNU09 3SE*2	ARNU12 3SE*2	ARNU15 3SE*2										
		S5						ARNU18 3S5*2	ARNU24 3S5*2								
ART COOL	Mirror	SE		ARNU07 3SE*2	ARNU09 3SE*2	ARNU12 3SE*2	ARNU15 3SE*2										
		S8						ARNU18 3S8*2	ARNU24 3S8*2								
Ceiling Cassette	1 Way	TJ		ARNU07 3TJ*2	ARNU09 3TJ*2	ARNU12 3TJ*2											
	2 Way	TL						ARNU18 3TL*2	ARNU24 3TL*2								
	4 Way	TR	ARNU05 3TR*2	ARNU07 3TR*2	ARNU09 3TR*2	ARNU12 3TR*2											
		TQ					ARNU15 3TQ*2	ARNU18 3TQ*2									
		TP							ARNU24 3TP*2	ARNU28 3TP*2							
		TN			ARNU09 3TN*2	ARNU12 3TN*2	ARNU15 3TN*2					ARNU36 3TN*2					
					ARNU09 3TN*A	ARNU12 3TN*A	ARNU15 3TN*A	ARNU18 3TN*A	ARNU24 3TN*A								
		TM						ARNU18 3TM*2	ARNU24 3TM*2	ARNU28 3TM*A		ARNU36 3TM*A	ARNU42 3TM*2	ARNU48 3TM*2			
Ceiling Concealed Duct	high Static	BH		ARNU07 3BHA2	ARNU09 3BHA2	ARNU12 3BHA2	ARNU15 3BHA2	ARNU18 3BHA2	ARNU24 3BHA2								
		BG		ARNU07 3BGA2	ARNU09 3BGA2	ARNU12 3BGA2	ARNU15 3BGA2	ARNU18 3BGA2	ARNU24 3BGA2	ARNU28 3BGA2		ARNU36 3BGA2	ARNU42 3BGA2				
		BR								ARNU28 3BRA2		ARNU36 3BRA2	ARNU42 3BRA2	ARNU48 3BRA2			
		B8								ARNU28 3B8A2		ARNU36 3B8A2				ARNU76 3B8A2	ARNU96 3B8A2
	Low Static	B1		ARNU07 3B1G2	ARNU09 3B1G2	ARNU12 3B1G2	ARNU15 3B1G2										
		B2						ARNU18 3B2G2	ARNU24 3B2G2								
	Built In	B3		ARNU07 3B3G2	ARNU09 3B3G2	ARNU12 3B3G2	ARNU15 3B3G2										
		B4						ARNU18 3B4G2	ARNU24 3B4G2								
Ceiling & Floor		VE			ARNU09 3VEA2	ARNU12 3VEA2											
Ceiling Suspended		VJ						URNU18 3VJA2	URNU24 3VJA2								
Floor Standing	With Case	CE		ARNU07 3CEA2	ARNU09 3CEA2	ARNU12 3CEA2	ARNU15 3CEA2										
		CF						ARNU18 3CFA2	ARNU24 3CFA2								
	Without Case	CE		ARNU07 3CEU2	ARNU09 3CEU2	ARNU12 3CEU2	ARNU15 3CEU2										
		CF						ARNU18 3CFU2	ARNU24 3CFU2								
Vertical AHU		NJ						ARNU18 3NJA2	ARNU24 3NJA2		ARNU30 3NJA2	ARNU36 3NJA2					
		NK											ARNU42 3NKA2	ARNU48 3NKA2	ARNU54 3NKA2		

❊ *ART COOL- SE/S8(* R:Mirror, V:Silver, B : Blue)
*Wall Mounted- A: Basic, L:Plasma
*Ceiling Cassette- A: Basic, C:Plasma

1.2 Outdoor Unit

Power Supply	8HP (6Ton)	10HP (8Ton)	12HP (10Ton)	14HP (12Ton)	18HP (14Ton)	20HP (16Ton)
3ph, 208/230V, 60Hz	072BAS4	096BAS4	121BAS4	144BAS4	168BAS4	192BAS4

Power Supply	22HP (18Ton)	28HP (24Ton)	36HP (30Ton)	42HP (36Ton)
3ph, 208/230V, 60Hz	216BAS4	288BAS4	360BAS4	432BAS4

Heat Recovery	ARWB

1.3 HR Unit

Power Supply	2 branches	3 branches	4 branches
1ph, 220V, 60Hz	PRHR021A	PRHR031A	PRHR041A

2. External Appearance

2.1 Indoor Unit

Ceiling Cassette- 1Way

ARNU073TJ*2
ARNU093TJ*2
ARNU123TJ*2

* A:Basic, C:Plasma

Ceiling Cassette- 4Way

ARNU053TR*2
ARNU073TR*2
ARNU093TR*2
ARNU123TR*2
ARNU153TQ*2
ARNU183TQ*2
ARNU243TP*2
ARNU283TP*2
ARNU073TN*A
ARNU093TN*A
ARNU093TN*2
ARNU123TN*A
ARNU123TN*2
ARNU153TN*A
ARNU153TN*2
ARNU183TN*A
ARNU243TN*A
ARNU183TM*2
ARNU243TM*2
ARNU283TM*A
ARNU363TM*A
ARNU423TM*2
ARNU483TM*2

* A:Basic, C:Plasma

Ceiling Concealed Duct - Low Static

ARNU073B1G2
ARNU093B1G2
ARNU123B1G2
ARNU153B1G2
ARNU183B2G2
ARNU243B2G2

Ceiling Concealed Duct – Built-in

ARNU073B3G2
ARNU093B3G2
ARNU123B3G2
ARNU153B3G2
ARNU183B4G2
ARNU243B4G2

Ceiling & Floor

ARNU093VEA2
ARNU123VEA2

Ceiling Suspended

URNU183VJA2
URNU243VJA2

Ceiling Cassette -2Way

ARNU183TL*2
ARNU243TL*2

* A:Basic, C:Plasma

Ceiling Concealed Duct - High Static

ARNU073BHA2
ARNU093BHA2
ARNU123BHA2
ARNU153BHA2
ARNU183BHA2
ARNU243BHA2
ARNU073BGA2
ARNU093BGA2
ARNU123BGA2
ARNU153BGA2
ARNU183BGA2
ARNU243BGA2
ARNU283BGA2
ARNU363BGA2
ARNU423BGA2
ARNU283BRA2
ARNU363BRA2
ARNU423BRA2
ARNU483BRA2
ARNU283B8A2
ARNU363B8A2
ARNU763B8A2
ARNU963B8A2

Wall Mounted

ARNU073SE*2
ARNU093SE*2
ARNU123SE*2
ARNU153SE*2
ARNU183S5*2
ARNU243S5*2

* A:Basic, L:Plasma

ART COOL Mirror

ARNU073SE*2
ARNU093SE*2
ARNU123SE*2
ARNU153SE*2
ARNU183S8*2
ARNU243S8*2

* R:Mirror
V:Silver
B : Blue

Floor Standing

With case

ARNU073CEA2
ARNU093CEA2
ARNU123CEA2
ARNU153CEA2
ARNU183CFA2
ARNU243CFA2

Without case

ARNU073CEU2
ARNU093CEU2
ARNU123CEU2
ARNU153CEU2
ARNU183CFU2
ARNU243CFU2

Vertical AHU

ARNU183NJA2
ARNU243NJA2
ARNU303NJA2
ARNU363NJA2
ARNU423NKA2
ARNU483NKA2
ARNU543NKA2

2.2 Outside unit

2.2.1 Heat Recovery

Chassis	Model Name	Model
UWC	ARWB072BAS4 ARWB096BAS4 ARWB121BAS4 ARWB144BAS4	
UWC UWC	ARWB168BAS4 ARWB192BAS4 ARWB216BAS4 ARWB288BAS4	
UWC UWC UWC	ARWB360BAS4 ARWB432BAS4	

3. Combination of Outdoor Units

3.1 Heat Recovery

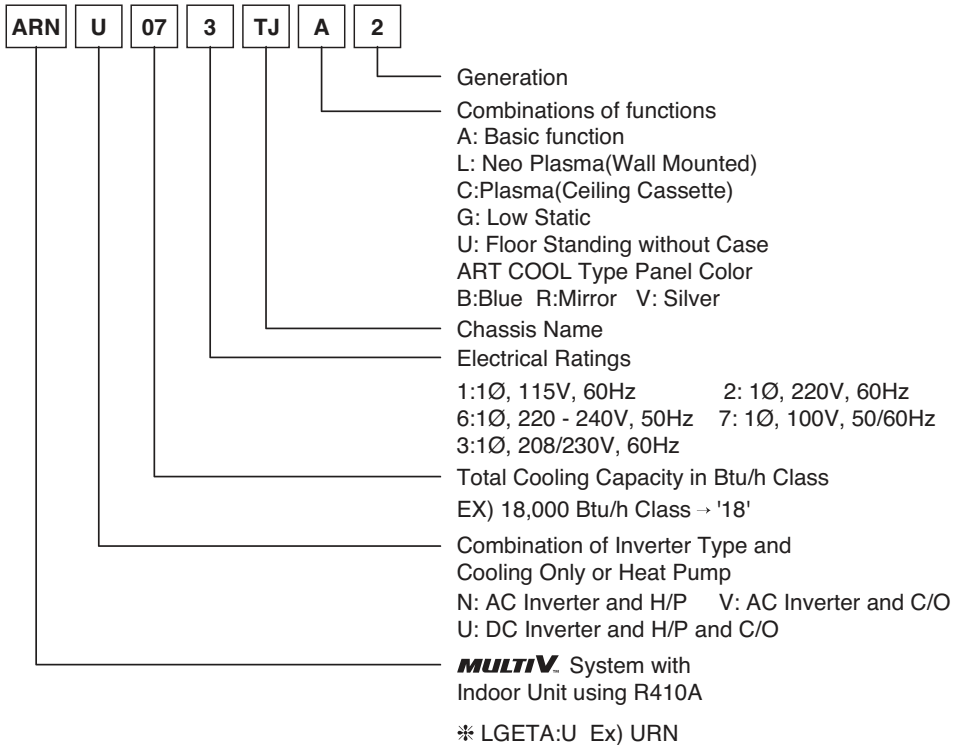
Model Name	HP	Ton	Number of Units	Module(Ton)			
				6	8	10	12
ARWB072BAS4	8	6	1	1			
ARWB096BAS4	10	8	1		1		
ARWB121BAS4	12	10	1			1	
ARWB144BAS4	14	12	1				1
ARWB168BAS4	18	14	2	1	1		
ARWB192BAS4	20	16	2	1		1	
ARWB216BAS4	22	18	2	1			1
ARWB288BAS4	28	24	2				2
ARWB360BAS4	36	30	3	1			2
ARWB432BAS4	42	36	3				3

■ The biggest module should be master module and others are slaves.

■ Setting method of master/slave and position of master in the system is explained in the installation chapter.

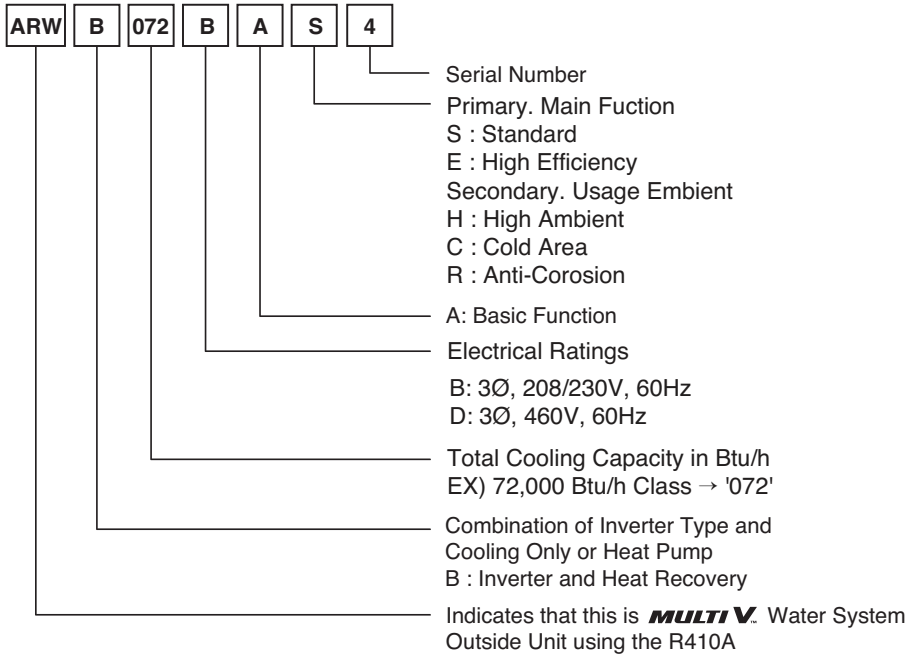
4. Nomenclature

4.1 Indoor Unit

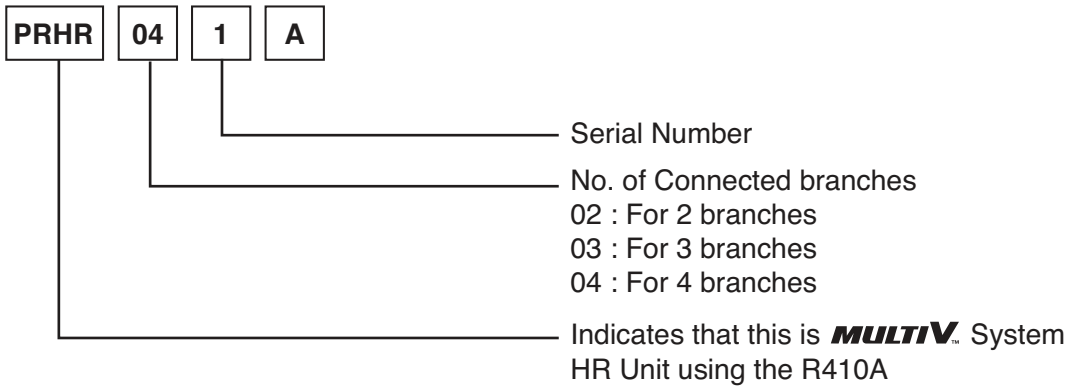


※ Heat recovery ventilator refer to the DX-Coil manual

4.2 Outside unit



4.3 HR Unit



Part 2
Outside units

Function

1. Basic control

1.1 Normal operation

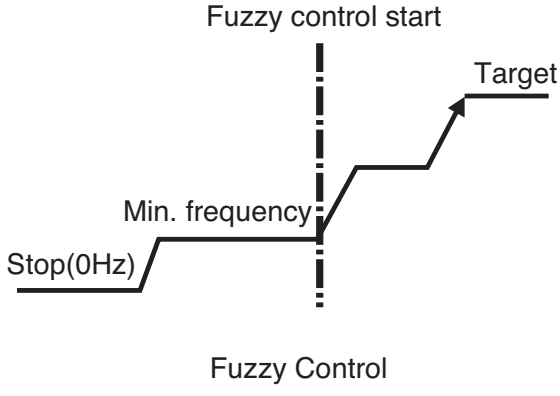
Actuator	Cooling operation	Heating operation	Stop state
Compressor	Fuzzy control	Fuzzy control	stop
Main EEV	Full open	Fuzzy control	Min. pulse
Subcooling EEV	Fuzzy control	• Avoiding control of high discharge temperature • Fuzzy control	Min. pulse
Indoor Unit EEV	Superheat fuzzy control	Subcooling fuzzy control	Min. pulse

Note : Heating operation is not functional at an outdoor air temperature of 45°C(113°F) or more.

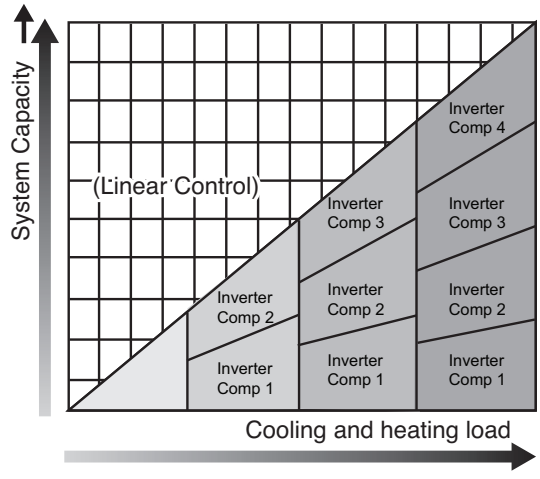
1.2 Compressor control

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(116.6~123.8°F), Te:2~5°C(35.6~41°F)]
(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 Master and slave Unit's EEV control

(1) Main EEV control
Main EEV operates with fuzzy control rules to keep the degree of super Heat(Superheat) (about 3°C or 6°F)at the evaporator outlet stable during heating mode
The degree of Superheat = Tsuction - Tevaporation
Tsuction : temperature at suction pipe sensor(°C,°F)
Tevaporation : evaporation temperature equivalent to low pressure(°C,°F)

(2) Subcooling EEV control(about 15°C or 30°F)
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,°F)
Tcondensation : condensation temperature equivalent to high pressure(°C,°F)

(3) Avoiding excessive high discharge temperature : when main EEV opens some given opening (R410A : 800 pls) and discharge temperature is above 85°C(185°F) 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.

Outside Unit

Component	Starting	Running	Ending
Inv Compressor	50Hz	Setting Value	50Hz
Main EEV	Max. pulse	Max. pulse	Normal control
Subcooling EEV	Min. pulse	20 pulse	80 pulse
4way valve	OFF	OFF	OFF

Indoor Unit

Component	Starting	Running	Ending
Fan	Normal control	OFF	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 : When low oil level which is measured by oil level sensor is kept continuously then oil return operation will be start.
- Oil return process ends if compressor protection control starts

2.1.2 Oil return control on heating mode

Outside Unit

Component	Starting	Running	Ending
Inv Compressor	50Hz	Setting Value	50Hz
Main EEV	Max. pulse	Max. pulse	Normal control
Subcooling EEV	Min. pulse	20 pulse	80 pulse
4way valve	ON	OFF	ON

Indoor Unit

Component	Starting	Running	Ending
Fan	Normal control	OFF	Normal control
Thermo on unit EEV	Normal control	400~800 pulse	Normal control
Thermo off unit EEV	80~130 pulse	400~800 pulse	80~130 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 Stopping operation

2.2.1 Stopping operation on cooling mode

Component	Operation	Note
Inv Compressor	OFF	-
Main EEV	32 pulse	-
Subcooling EEV	16 pulse	Stop(Min. pulse)
4way valve	OFF	-

2.2.2 Stopping operation on heating mode

Component	Operation	Note
Inv Compressor	OFF	-
Main EEV	32 pulse	-
Subcooling EEV	16 pulse	Stop(Min. pulse)
4way valve	ON	OFF over 30°C(86°F) air temperature

3. Protection control

3.1 Pressure protection control

3.1.1 Pressure control on cooling mode

■ **High pressure control**

Pressure Range	Compressor
$P_d \geq$ 4003 kPa(580.6 psi)	Stop
$P_d >$ 3775 kPa(547.5 psi)	-15Hz/10sec.
$P_d \geq$ 3578 kPa(518.9 psi)	Frequency holding
$P_d \geq$ 3480 kPa(504.7 psi)	+2 Hz or less/10sec.
$P_d <$ 3480 kPa(504.7 psi)	Normal control

■ **Low pressure control**

Pressure Range	Compressor
Ps ≤ 98 kPa(14.2 psi), 1 minute later operation	Stop
Ps ≤ 124 kPa(18 psi), 1 minute before operation	-15Hz/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
$P_d \geq$ 4003 kPa(580.6 psi)	Stop
$P_d >$ 3415 kPa(495.3 psi)	-15Hz/10sec.

■ **Low pressure control**

Pressure Range	Compressor
Ps ≤ 98 kPa(14.2 psi)	Stop
Ps ≤ 124 kPa(18 psi)	-15Hz/10sec.
Ps ≤ 137 kPa(19.9 psi)	Frequency holding
Ps ≤ 190 kPa(27.6 psi)	+2 Hz or less/10sec.
$P_s \geq$ 190 kPa(27.6 psi)	Normal control

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

3.2 Discharge temperature control

■ **Outside unit control**

Temperature range	Compressor	Sub cooling EEV	IDU EEV
Tdis > 110°C(230°F)	-5Hz/10sec.	SC,SH decrease control	SH decrease control
Tdis > 108°C(226.4°F)	-5Hz/30sec.	SC,SH decrease control	SH decrease control
Tdis ≥ 105°C(221°F)	Frequency holding	SC,SH decrease control	SH decrease control
Tdis ≤ 100°C(212°F)	Normal control	SC,SH decrease control	SH decrease control
Tdis > 100°C(212°F)	Normal control	SC,SH decrease control	SH decrease control

SC : Sub Cooling, SH : Super Heating

3.3 Inverter protection control

Cooling mode

	Normal Operation		Frequency Down		System Stop	
	6Ton~10Ton	12Ton~16Ton	6Ton~10Ton	12Ton~16Ton	6Ton~10Ton	12Ton~16Ton
AC Input Current	22A or less	30A or less	22A or more	30A or more	24A or more	32A or more
Compressor Current	24A or less	35A or less	24A or more	35A or more	30A or more	41A or more

Heating mode

	Normal Operation		Frequency Down		System Stop	
	6Ton~10Ton	12Ton~16Ton	6Ton~10Ton	12Ton~16Ton	6Ton~10Ton	12Ton~16Ton
AC Input Current	22A or less	30A or less	22A or more	30A or more	24A or more	32A or more
Compressor Current	26A or less	35A or less	26A or more	35A or more	30A or more	41A or more

❊ AC input current is input current of inverter compressor except constant current (current pass through noise filter)

3.4 Phase detection

■ Power lines are connected correctly like follow case, product do not work and display error no.
Case 1) Missed connect 1 or more phase line.

Case	Terminal block			Error No.
	L1	L2	L3	
Missed Phase	X			50
		X		
			X	5

❊ The error occur 2 or more unit of the series at the same time, only a small unit number will be displayed.
Example) Master and Slave2 occur error no. 50, '501' display on the 7segment.
* Master: ***1, Slave1:***2, Slave2:***3

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)	
Slave1 model code is displayed (3sec)	
Slave2 model code is displayed (3sec)	
Total capacity including sub units is displayed (2sec)	
Heat recovery : Display 2 is default value	
Power type	
Model type	

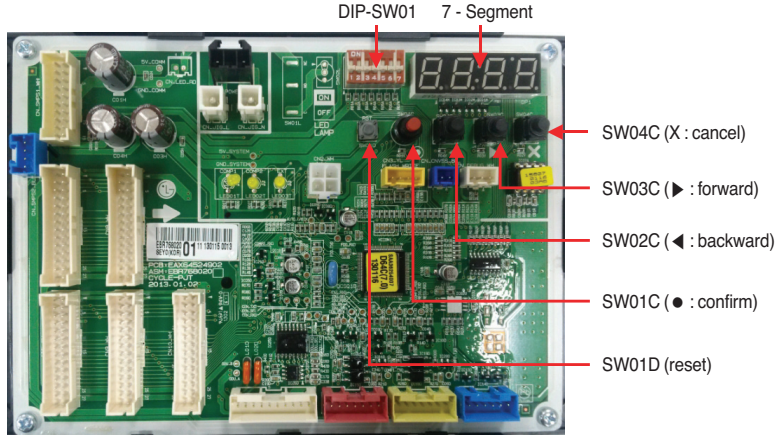
2) Step 2 : Communication check
- If all model code is displayed in 7 segment including all Slave unit, communication between Outside units is normal.
- If 104* is displayed in 7-segment, check communication wires between Outside units and Dip switch setting.

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

■ Master/ Slave unit
- All errors of units including Slave units are displayed in 7 segment.
- If communication between main PCB and inverter PCB isn't normal, 52* is displayed in 7-segment If error is displayed, check corresponding wires.

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.

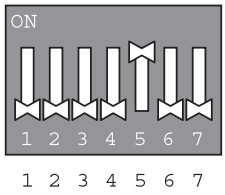
■ Heat Pump (Main PCB)

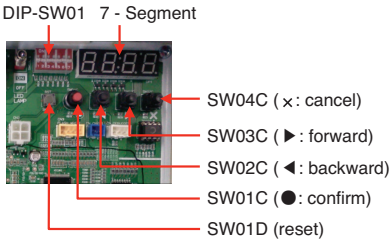


Push address(red) button for 3 sec.	
Auto address starts	
Auto address is in progress (max. 15 min.)	
The number of indoor units is displayed for 10 sec.	 (35 indoor units found)
The number of HR units is displayed for 10 sec.	 (2 HR units found)
Auto address process is finished. Every indoor unit displays 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.



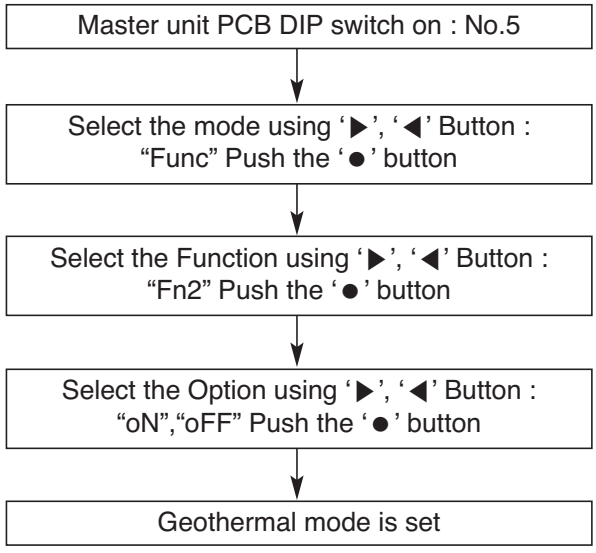


MODE		FUNCTION		OPTION			VALUE		ACTION		Remark
Content	Display1	Content	Display2	Content		Display3	Content	Display4	Implement	Display5	
Installation	Func	Geo thermal mode	Fn2	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
		220V Out for Solenoid valve	Fn3	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
		Variable water flow control	Fn4	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
		Outside unit adress	Fn5	-		-	0~254	set the value	Change the set value	blank	save in EEPROM
		Target pressure adjusting	Fn7	OFF	OP1~OP4	-	-	-	Change the set value	blank	save in EEPROM
		Using Sump heater	Fn8	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
		IDU capacity adjusting	Fn9	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
SVC	Svc	Vacum mode	SE1	-		-	-	-	Start operation	vAcc	-
		Forced oil return	SE2	-		-	-	-	Start operation	OI	-
		Back up	SE3	OFF	ON	-	-	-	Change the set value	blank	save in EEPROM
		Refrigerant noise reduction mode	SE4	OFF	ON	-	-	-	Change the set value	on off	save in EEPROM
		Cycle data view	SE5	OP1~OP7		-	-	-	Show in segment	Show the each numerical value in process	-

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

4.2 Geothermal mode

Mode setting method



- ON: Set to operate in geothermal mode
- OFF: Set to operate in general mode

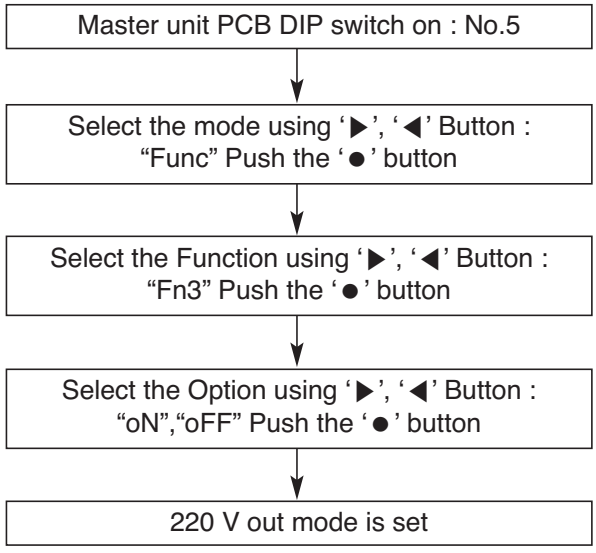
Anti freeze type	Minimum temperature for anti freezing [°C(°F)]					
	0	-5(23)	-10(14)	-15(5)	-20(-4)	-25(-13)
Ethylene glycol (%)	0	12(54)	20(68)	30(86)	-	-
Propylene glycol (%)	0	17(63)	25(77)	33(91)	-	-
Methanol (%)	0	6(43)	12(54)	16(61)	24(75)	30(86)

CAUTION

- Ask an authorized technician to setting a function.
- Anti freeze is essential for geothermal mode.

4.3 220 V out for solenoid valve

Mode setting method



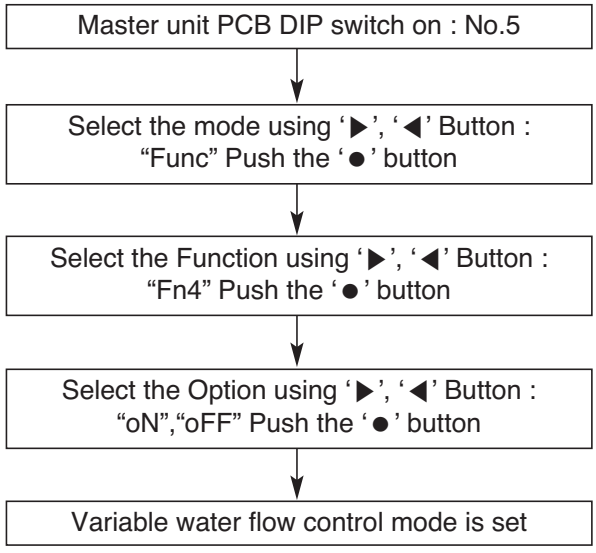
- ON: Set to control the heat source water pipe Solenoid Valve from the product.
- OFF: Set not to control the heat source water pipe Solenoid Valve from the product.

CAUTION

- Ask an authorized technician to setting a function.
- If do not use a function, set an off mode.

4.4 Variable water flow control

Mode setting method



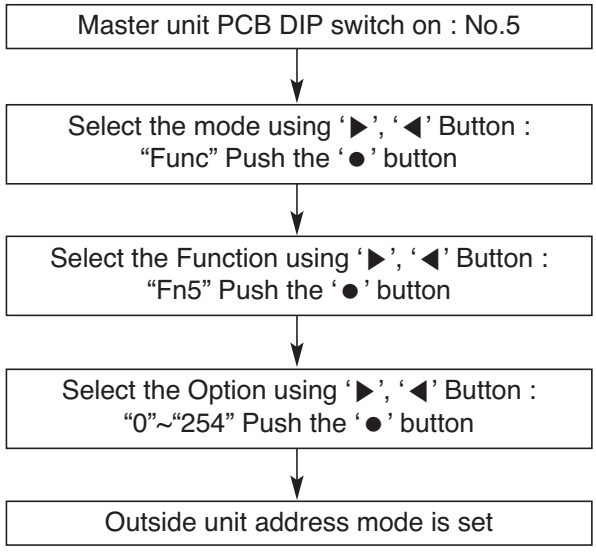
- ON: Set to control the variable water flow control valve from the product
- OFF: Set not to control the variable water flow control valve from the product

CAUTION

- Ask an authorized technician to setting a function.
- If do not use a function, set an off mode.

4.5 Outside unit address

Mode setting method

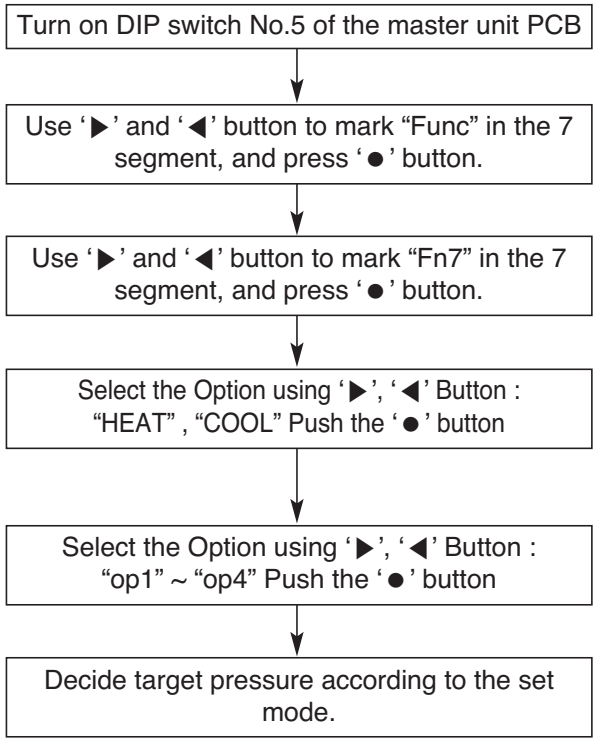


CAUTION

- Ask an authorized technician to setting a function.
- If use a function, first install a Central controller.

4.6 Target pressure adjusting

How to set the mode



Setting

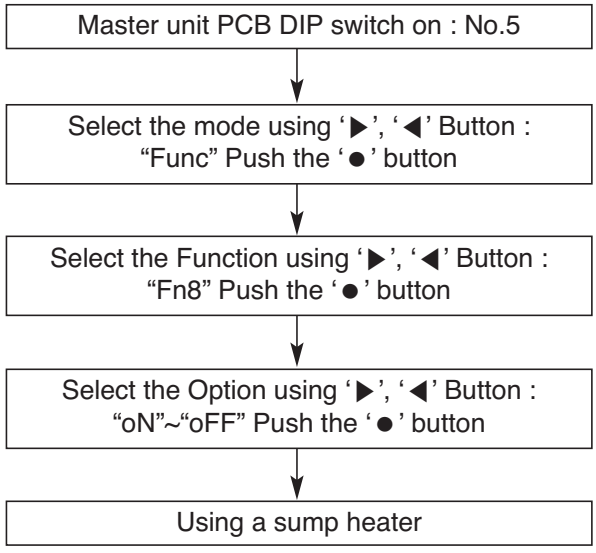
mode	Purpose		Condensing temperature variation	Evaporating temperature variation
	"Heat"	"Cool"		
op1	Increase capacity	Increase capacity	-3°C(26.6°F)	+2°C(35.6°F)
op2	Decrease power consumption	Increase capacity	-1.5°C(29.3°F)	-2°C(28.4°F)
op3	Decrease power consumption	Decrease power consumption	+2.5°C(36.5°F)	-4°C(24.8°F)
op4	Decrease power consumption	Decrease power consumption	+4.5°C(40.1°F)	-6°C(21.2°F)

CAUTION

- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- Change a power consumption or capacity.

4.7 Using a sump heater

Mode setting method



Mode setting

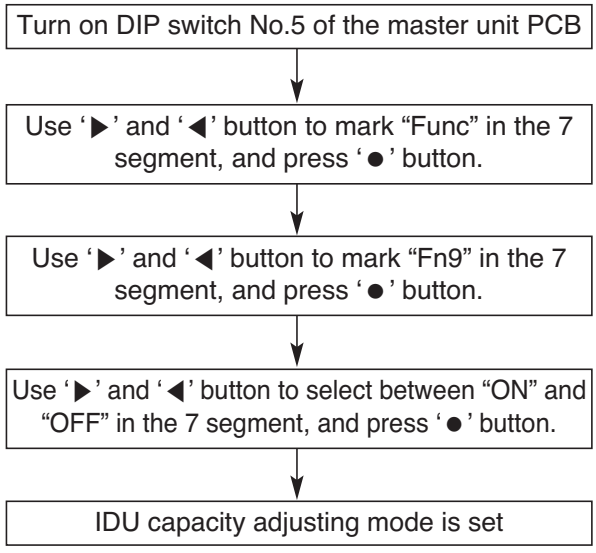
- ON: Set to control the Sump Heater from the product
- OFF: Set not to control the Sump Heater from the product

CAUTION

- Ask an authorized technician to setting a function.
- When the function is not used, set it to OFF.
- If the temperature of the outside unit installation place is 0°C or less, we recommend the connection and usage of Sump Heater.

4.8 IDU capacity adjusting

Mode setting method



Mode setting

- ON: Set to control the Low capacity mode
- OFF: Set not to control

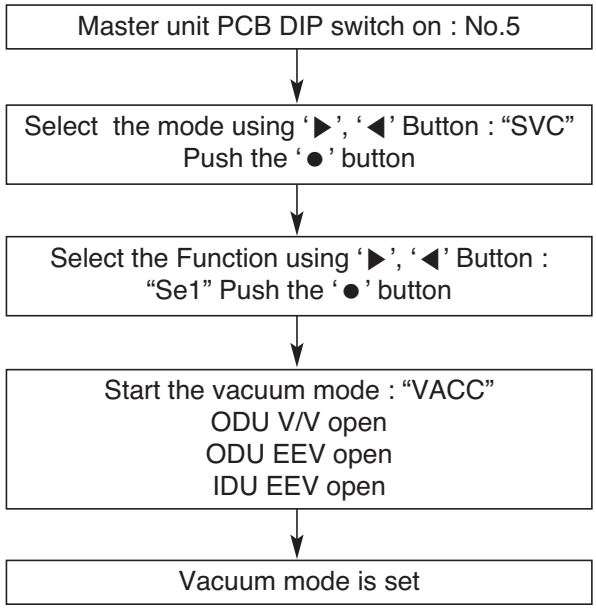
CAUTION

• Ask an authorized technician to setting a function.

4.9 Vacuum Mode

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

Mode setting method



Vacuum mode cancellation method

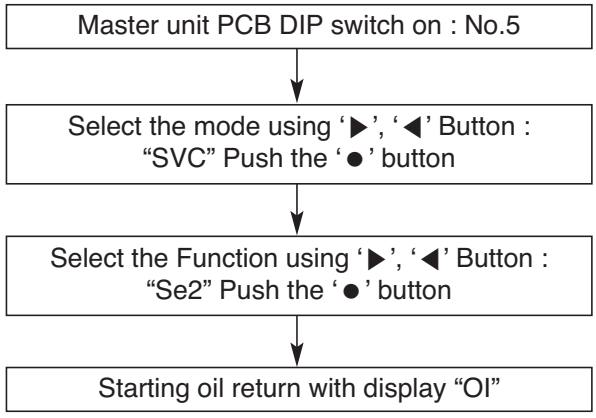
Push the reset button on Master unit PCB

CAUTION

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

4.10 Forced oil return

Mode setting method



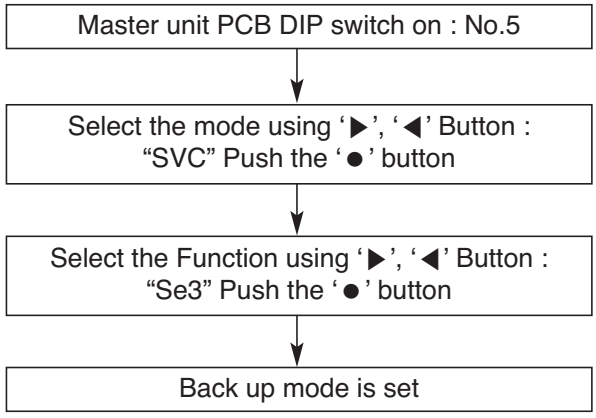
· Auto reset after oil return completed.

CAUTION

• Ask an authorized technician to setting a function.

4.11 Back up

Mode setting method

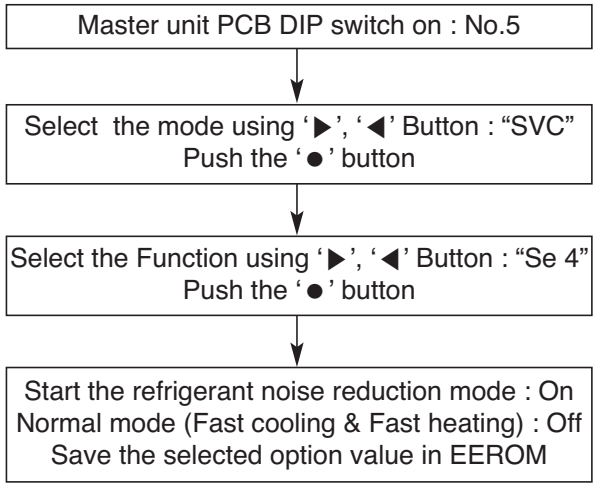


CAUTION

- Ask an authorized technician to setting a function.

4.12 Refrigerant noise reduction mode

Refrigerant noise reduction mode setting method



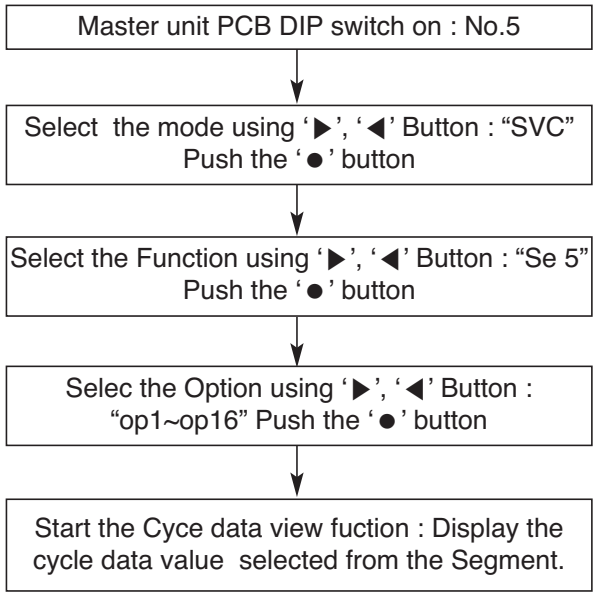
CAUTION

- Ask an authorized technician to setting a function.

4.13 Cycle Data View

This function is intended to identify the Cycle data of outside unit, which is running on.
The 7 Segment is display 16 different cycle data.

Cycle data view function setting method



step	Title	7-seg	example	seg_1	seg_2	seg_3	seg_4
op1	Current High Pressure	P1	4321kPa	4	3	2	1
op2	Current low Pressure	P2	1234kPa	1	2	3	4
op3	Inv 1 Pulse	h1	120		1	2	0
op4	Subcooling degree	T1	5.3			5	3
op5	Superheating degree	T2	-4.5		-	4	5
op6	ODU temp.	T3	10		1	0	0
op7	Suctino temp.	T4	43.4		4	3	4
op8	Comp1 discharge temp.	T5	150		1	5	0
op9	Liquid pipe temp.	T7	10		1	0	0
op10	Sc_out	T9	10		1	0	0
op11	Water out temp.	T10	10		1	0	0
op12	Inlet pipe temp of IDU	T13	-10°	-	1	0	0
op13	main1 eev	PLS1	1940	1	9	4	0
op14	sc eev	PLS3	16			1	6
op15	IDU running capacity	IDU1	24k			2	4
op16	Total number of IDU	IDU2	10			1	0

Part 3
HR Units

HR Units

Specifications

1. HR Unit

Model			PRHR021	PRHR031	PRHR041
Max. Connectable No. of Indoor Units			16	24	32
Max. Connectable No. of Indoor Units of a branch			8	8	8
Nominal Input	Cooling		26	40	40
	Heating		26	40	40
Net. Weight	kg		18	20	22
	lbs		39.7	44.1	48.5
Dimensions (WxHxD)	mm		801x218x617	801x218x617	801x218x617
	Inch		31.5x8.6x24.3	31.5x8.6x24.3	31.5x8.6x24.3
Casing			Galvanized steel plate		
Connecting Pipes	Indoor	Liquid Pipe [mm/inch]	Ø9.52[3/8]		
		Gas Pipe [mm/inch]	Ø15.88[5/8]		
	Outdoor	Liquid [mm/inch]	Ø9.52[3/8]	Ø12.7[1/2]	Ø15.88[5/8]
		Low Pressure [mm/inch]	Ø22.2[7/8]	Ø28.58[1 1/8]	Ø28.58[1 1/8]
		High Pressure [mm/inch]	Ø19.05[3/4]	Ø22.2[7/8]	Ø22.2[7/8]
Sound Absorbing Insulation Material			Polyethylene Foam		
Current	Minimum circuit Amps(MCA)		0.2		
	Maximum fuse Amps(MFA)		15		
Power Supply			1Ø, 220-240V, 50Hz / 1Ø, 220, 60Hz		

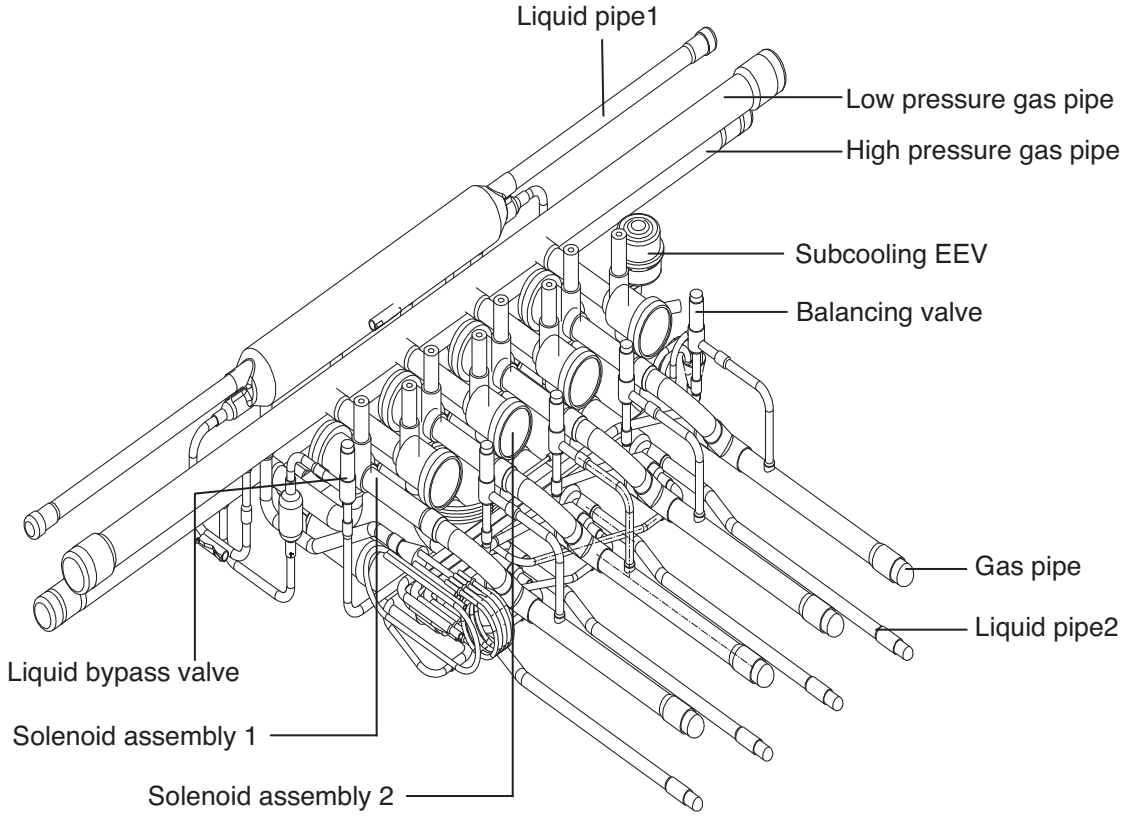
Notes:

1. Voltage range : Units are suitable for sue on electrical systems where voltage supplied to units terminals is not below or above listed range limits.
2. Maximum allowable voltage unbalance between phases is 2%
3. MCA/MFA MCA = 1.25 * FLA
   MFA ≤ 4*FLA
   (Next lower standard fuse rating. Min. 15A)
4. Select wire size based on the MCA
5. Instead of fuse, use circuit.

Parts Functions

1. Parts Functions

Parts name	Symbol	Major function
Low pressure gas pipe	LPGV	Pipe for low pressure gas
High pressure gas pipe	HPGV	Pipe for high pressure gas
Liquid pipe 1	LP1	Liquid pipe connected with outside unit
Liquid bypass valve	LBV	Prevent liquid charging
Solenoid assembly 1, 2	SOL1, 2	Control the path for heating or cooling
Liquid pipe 2	LP2	Liquid pipe connected with indoor unit
Gas pipe	GSP	Gas pipe connected with indoor unit
Balancing valve	BLV	Control the pressure between High and Low pressure pipe during operation switching
Subcooling EEV	SCEEV	Control the subcooling

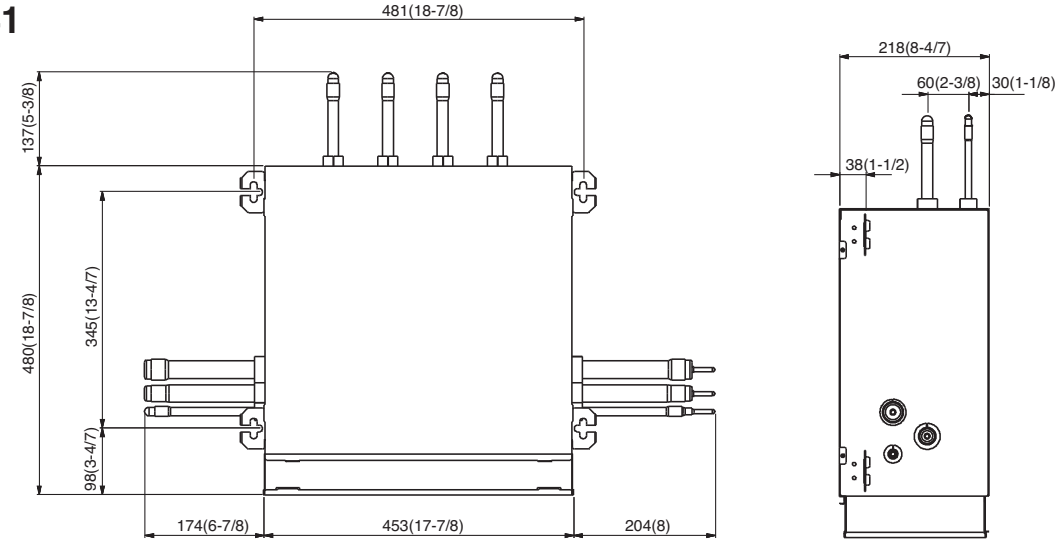


Dimensions

1. HR Units

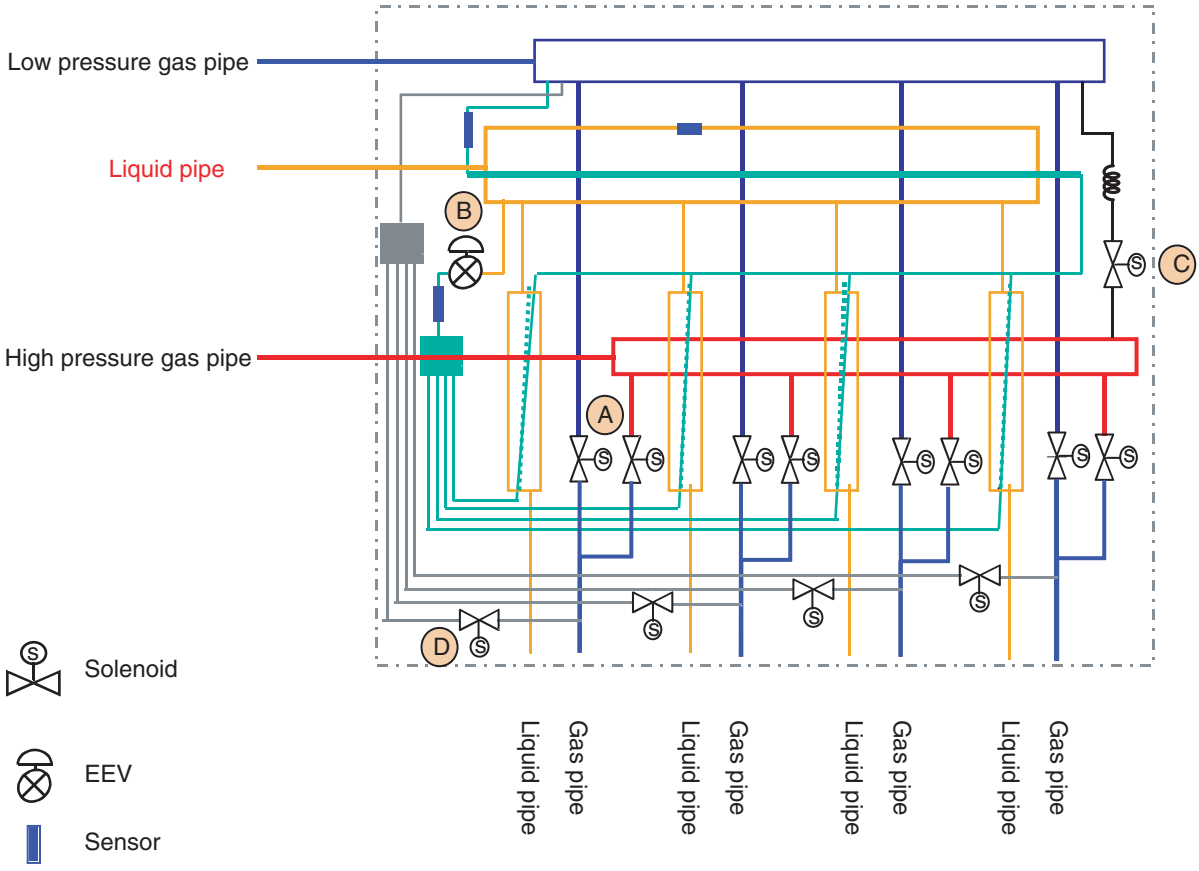
(Unit : mm(inch))

PRHR021
PRHR031
PRHR041



Piping Diagrams

1. HR Unit



Ⓐ : To be switched operation between cooling and heating by two Solenoid valve

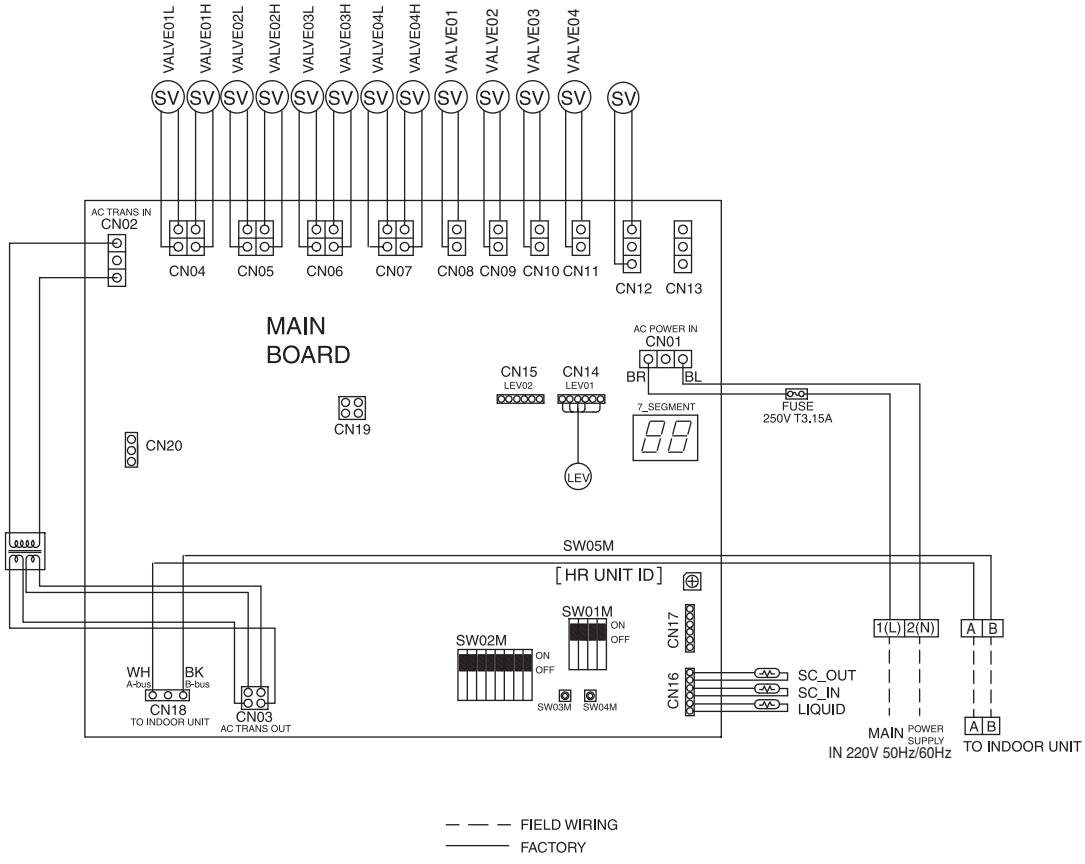
Ⓑ : To be used decreasing noise according to sub-cooling of inlet and outlet of indoor unit (Simultaneous operation)

Ⓒ : To prevent liquid charging between high pressure gas valve and HR unit at cooling mode

Ⓓ : To be controlled the pressure between high and low pressure pipe during operation switching

Wiring Diagrams

1. HR Units



CN04	Solenoid valve 01L/H(For room1)
CN05	Solenoid valve 02L/H(For room2)
CN06	Solenoid valve 03L/H(For room3)
CN07	Solenoid valve 04L/H(For room4)
CN08	Solenoid valve 01 (Bypass for room1)
CN09	Solenoid valve 02 (Bypass for room2)
CN10	Solenoid valve 03 (Bypass for room3)
CN11	Solenoid valve 04 (Bypass for room4)
CN12	Solenoid valve bypass
CN14	Sub cooling EEV
CN16(SC Out)	Sensor, sub cooling out
CN16(SC In)	Sensor, sub cooling in
CN18(Liquid)	Sensor, liquid receiver
SW01M	Solonoid valve number Setting(When manual address)
SW02M(1)	Selecting, auto address(↓) or manual address(↑)
SW02M(2~3)	Setting, total number of indoor connected
SW03M	Setting, the address of indoor_10(When manual address)
SW04M	Setting, the address of indoor_1(When manual address)
SW05M	Setting, HR unit number

Functions

1. Basic Control

1.1 Normal Operation

Actuator	Power on	Cooling operation	Heating operation	Stop state
High pressure gas valve	Close	Close	Open	Keep
Low pressure gas valve	After 30 sec. Open	Open	Close	Keep
Liquid valve	Close	Open	Close	Close

1.2 Starting Control(Heating Mode Only)

If the system is operated in the heating mode, all high pressure gas valves are opened

1.3 Valve Control

Mode change timer is calculated as Table 1, and valves are controlled by Mode change timer according to Table 2.

Table 1. Mode change timer calculation

Previous mode	Changing mode	Mode change timer
Stop or ventilation	Cooling or heating	120 sec
Cooling mode	Heating	180 sec
Heating mode	Cooling	120 sec
Cooling or heating	Stop or ventilation	During heating : 60 sec During cooling : 0 sec

Table 2. Valve control by mode change timer

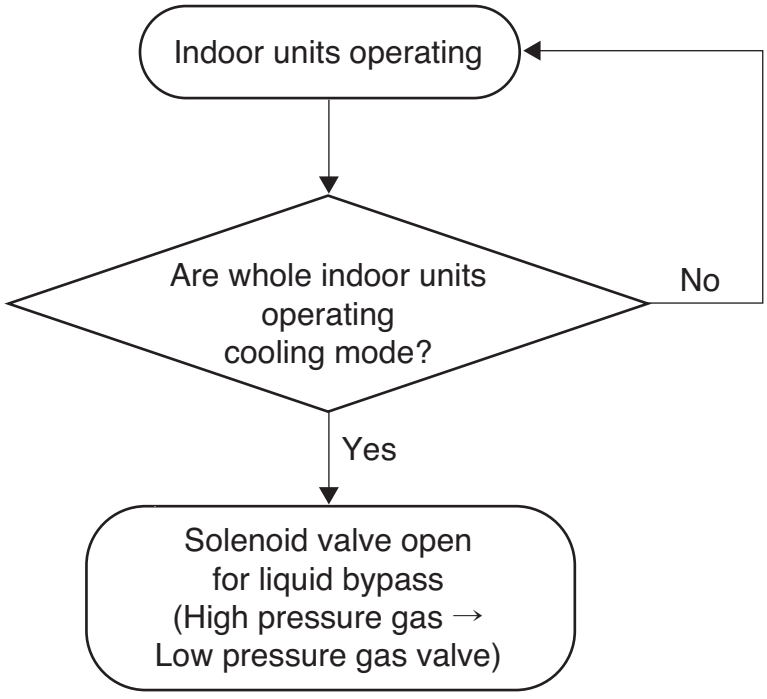
Operating mode	Mode change timer	H/P gas valve	L/P gas valve	Balancing valve
Cooling	120 ≤ timer	Keep	Keep	Close
	0 < timer < 120	Close	Close	Open
	timer = 0	Close	Open	Close
Heating	180 ≤ timer	Keep	Keep	Close
	0 < timer < 180	Close	Close	Close
	timer = 0	Open	Close	Close
Stop or ventilation	0 < timer < 5	Cooling mode : Close	Keep	Close
	Timer = 0	Heating mode : Low pressure gas valve → Close	Keep	Close

2. Special Control

2.1 Oil Return/Defrost Control

Component	Starting	Running	Ending
Inverter compressor	Stop	60 Hz	40 Hz
High pressure gas valve	Keep	Close	Open or Close
Low pressure gas valve	Keep	Open	Open or Close
Balancing valve	Open for 30s	Close	Close

2.2 Liquid Bypass Control



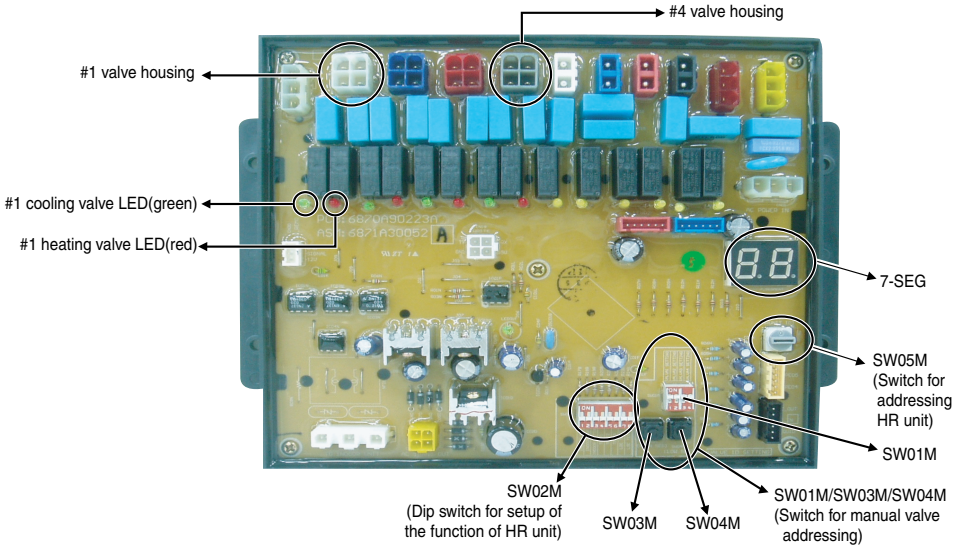
2.3 Subcooling EEV Control

Target : about 25°C(45°F)
Subcooling EEV works with Fuzzy rules to keep the degree of subcooling at the outlet of subcooler during simultaneous operation
The degree of subcooler = T outlet of subcooler – T inlet of subcooler

Part 4
PCB Setting and Test Run

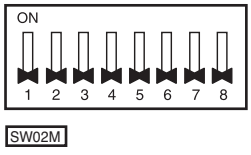
PCB Setting and Test Run

HR Unit PCB



1. Switch for Setup of HR Unit

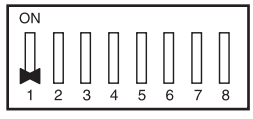
1. Main function of SW02M

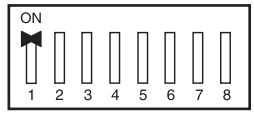


SW02M

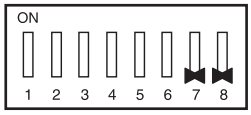
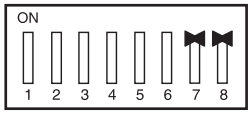
ON switch	Selection	
No.1	Method for addressing valves of an HR unit (Auto/Manual)	
No.2	Model of HR unit	
No.3	Model of HR unit	
No.4	Valve group setting	
No.5	Valve group setting	
No.6	Valve group setting	
No.7	Use only in factory production (preset to “OFF”)	Zoning setting ("ON")
No.8	Use only in factory production (preset to “OFF”)	

1) Selection of the method for addressing valves of an HR unit (Auto/Manual)

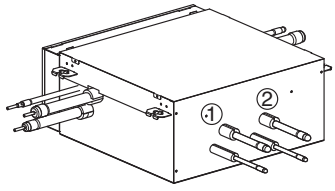
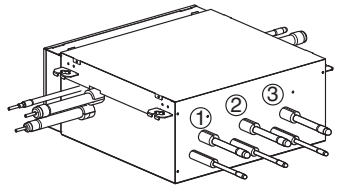
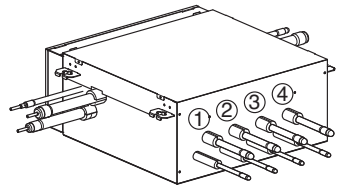
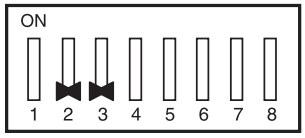
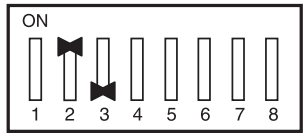
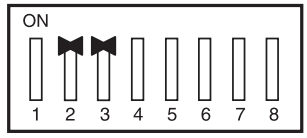
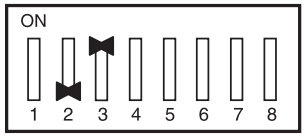
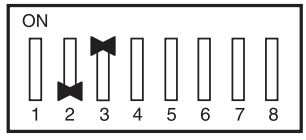
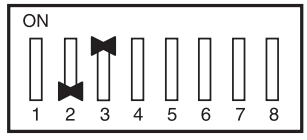
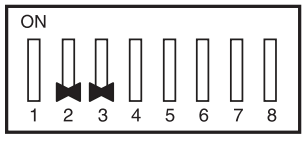
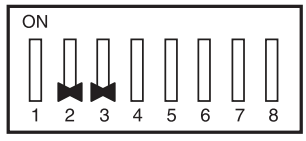
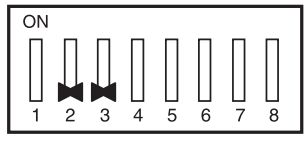
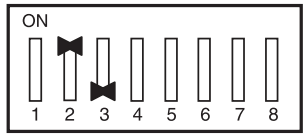
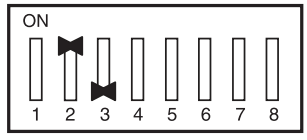
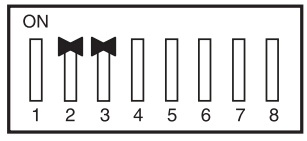




2) Setting the zoning control

	DIP S/W setting
Normal control	
Zoning control	

2) Selection of the model of the HR unit

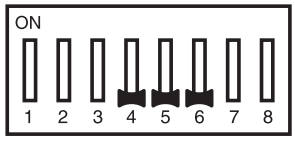
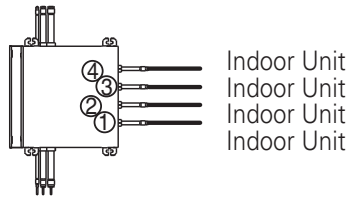
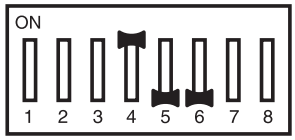
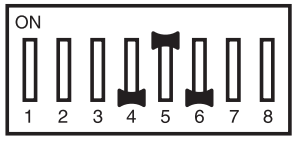
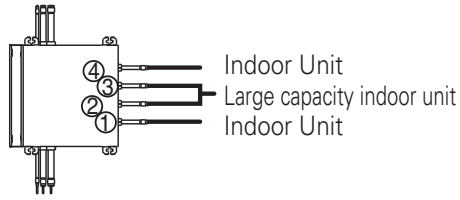
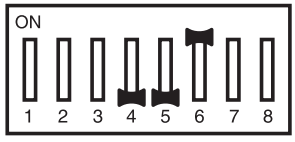
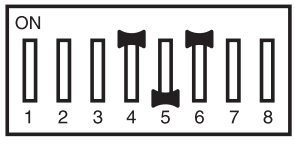
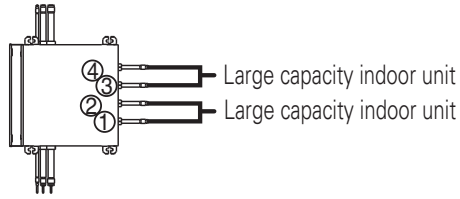
	 (For 2 branches) PRHR021	 (For 3 branches) PRHR031	 (For 4 branches) PRHR041
Initial Setting			
1 branches Connected			
2 branches Connected			
3 branches Connected			
4 branches Connected			

❊ Each model is shipped with the switches No.2 and No.3 pre-adjusted as above in the factory.

WARNING

- If you want to use a PRHR021 for 2 branches HR unit after closing the 3rd pipes, set the dip switch for 2 branches HR unit.
- If you want to use a PRHR031 for 3 branches HR unit after closing the 4th pipes, set the dip switch for 3 branches HR unit.
- If you want to use a PRHR041 for 2 branches HR unit after closing the 3rd and 4th pipes, set the dip switch for 2 branches HR unit.
- The unused port must be closed with a copper cap, not with a plastic cap.

3) Setting the Valve group.

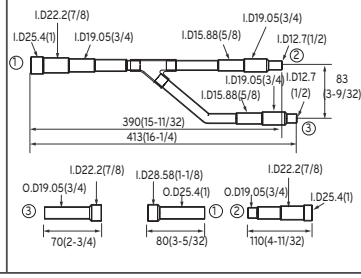
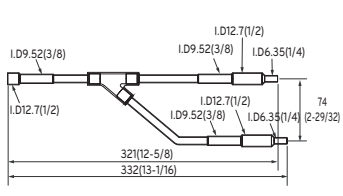
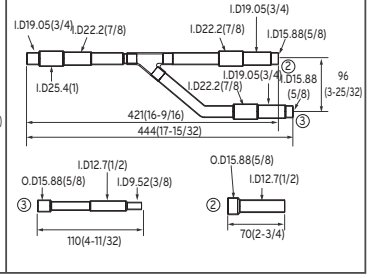
	DIP S/W setting	Example
Not control		
No.1, 2 Valve Control		
No.2, 3 Valve Control		
No.3, 4 Valve Control		
No.1, 2 Valve / No.3, 4 Valve Control		

Note:

If the large capacity indoor units are installed, below Y branch pipe should be used

✻ Y branch pipe

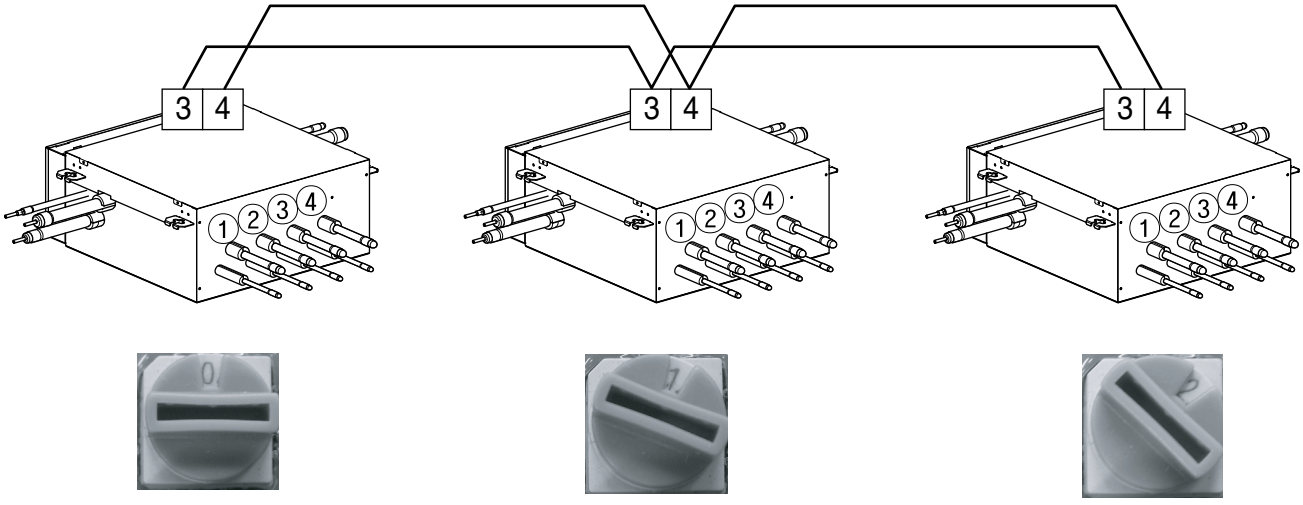
[Unit:mm(inch)]

Models	Low Pressure Gas Pipe	Liquid pipe	High Pressure Gas Pipe
ARBLB03321			

2. SW05M (Rotary switch for addressing HR unit)

Must be set to '0' when installing only one HR unit.
When installing multiple HR units, address the HR units with sequentially increasing numbers starting from '0'.

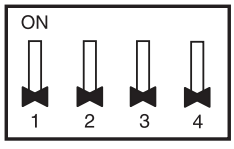
Ex) Installation of 3 HR units



3. SW01M/SW03M/SW04M (Dip switch and tact switch for manual valve addressing)

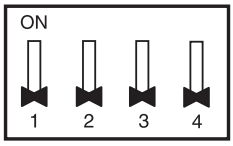
1) Normal setting (Non-Zoning setting)

- Used in manual addressing of the valve in the HR unit
- Set the address of the valve of the HR unit to the central control address of the connected indoor unit.
- SW01M: selection of the valve to address
  SW03M: increase in the digit of 10 of valve address
  SW04M: increase in the last digit of valve address
- Prerequisite for manual valve addressing : central control address of each indoor unit must be preset differently at its wired remote control.

	Switch No.	Setup
 SW01M	No.1	Manual addressing of valve #1
	No.2	Manual addressing of valve #2
	No.3	Manual addressing of valve #3
	No.4	Manual addressing of valve #4
SW03M 	SW03M	Increase in the digit of 10 of valve address
SW04M 	SW04M	Increase in the last digit of valve address

2) Zoning setting

- Set the address of the valve of the HR unit to the central control address of the connected indoor unit.
- SW01M : selection of the valve to address
  SW03M : increase in the digit of 10 of valve address
  SW04M : increase in the last digit of valve address
  SW05M :Rotary S/W
- Prerequisite for manual valve addressing : central control address of each indoor unit must be preset differently at its wired remote control.

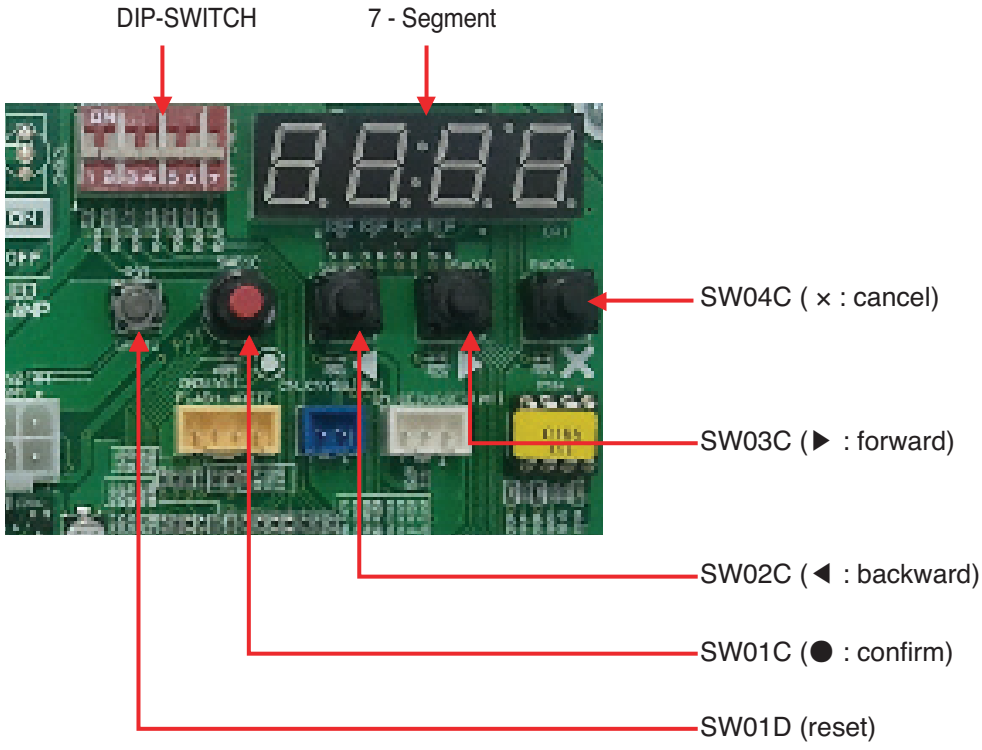
	S/W No.	Setup
 SW01M	No.1	Manual addressing of valve #1
	No.2	Manual addressing of valve #2
	No.3	Manual addressing of valve #3
	No.4	Manual addressing of valve #4
SW03M 	SW03M	Increase in the digit of 10 of valve address
SW04M 	SW04M	Increase in the last digit of valve address
SW05M 	SW05M	Manual addressing of zoning indoor units

2. Automatic Addressing

The address of indoor units would be set by Automatic Addressing

- Wait for 3 minutes after supplying power.
  (Master and Slave Outside units, indoor units)
- Press RED button of the Outside units for 5 seconds. (SW01C)
- A “88” is indicated on 7-segment LED of the Outside unit PCB.
- For completing addressing, 2~7 minutes are required depending on numbers of connected indoor units
- Numbers of connected indoor units whose addressing is completed are indicated for 30 seconds on 7-segment LED of the Outside unit PCB
- After completing addressing, address of each indoor unit is indicated on the wired remote control display window. (CH01, CH02, CH03, ……, CH06 : Indicated as numbers of connected indoor units)

■ Heat Recovery (MAIN PCB)

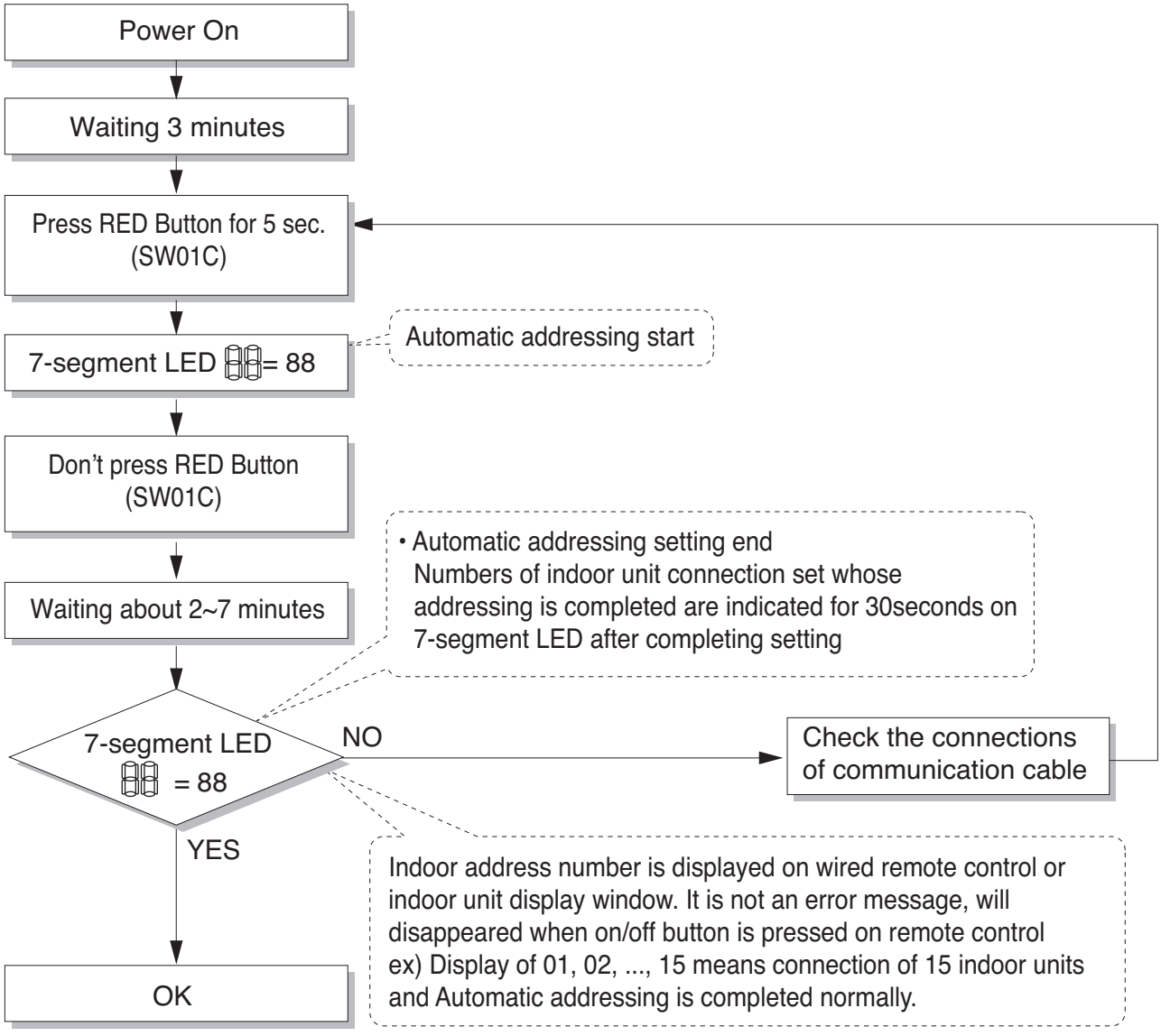


CAUTION

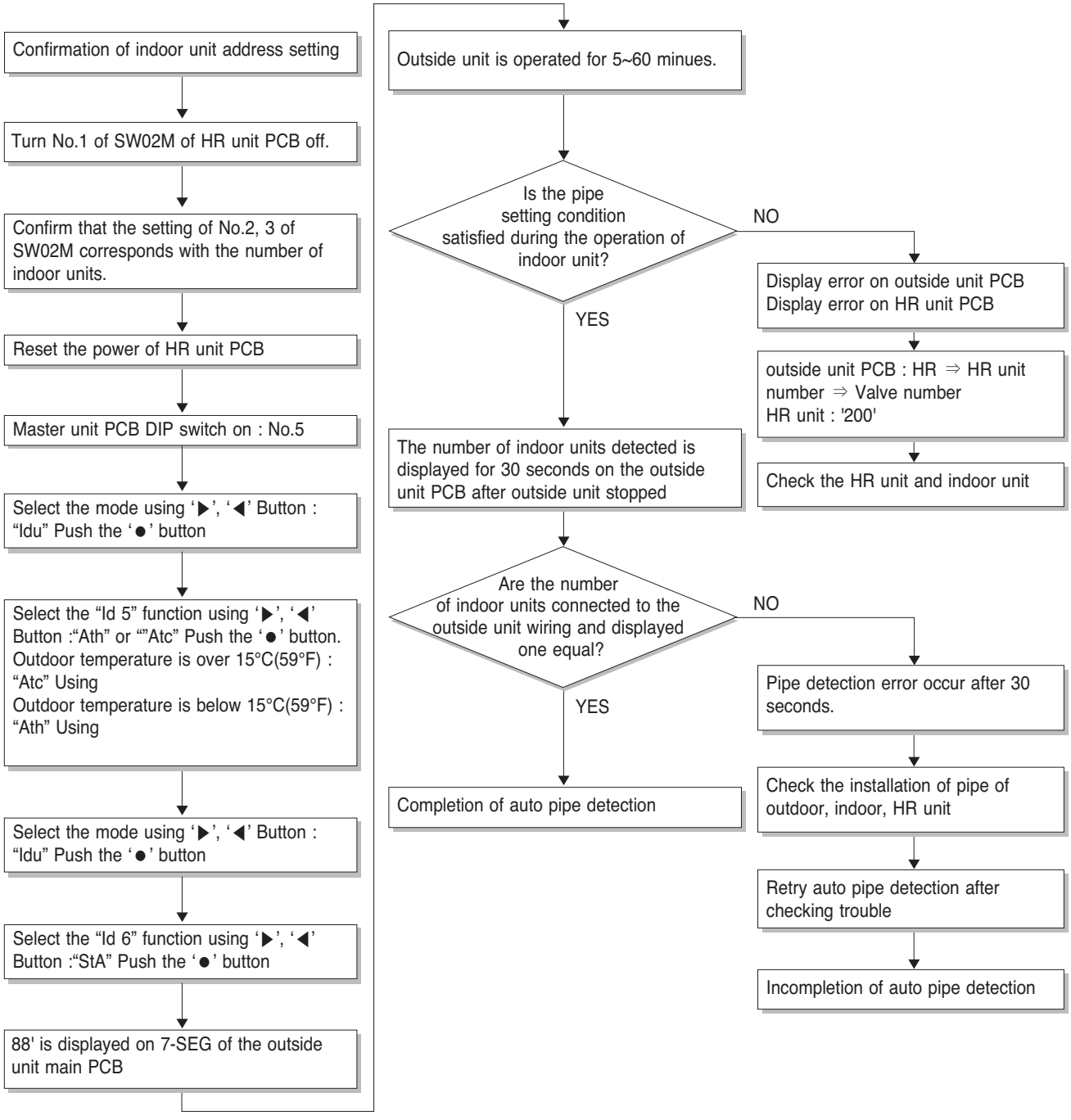
- **In replacement of the indoor unit PCB, always perform Automatic addressing setting again (At that time, please check about using Independent power module to any indoor unit.)**
- **If power supply is not applied to the indoor unit, operation error occur.**
- **Automatic Addressing is only possible on the master Unit.**
- **Automatic Addressing has to be performed after 3 minutes to improve communication.**

3. Flow chart for Chart for Auto-Addressing of Indoor and HR Unit

1) The Procedure of Automatic Addressing

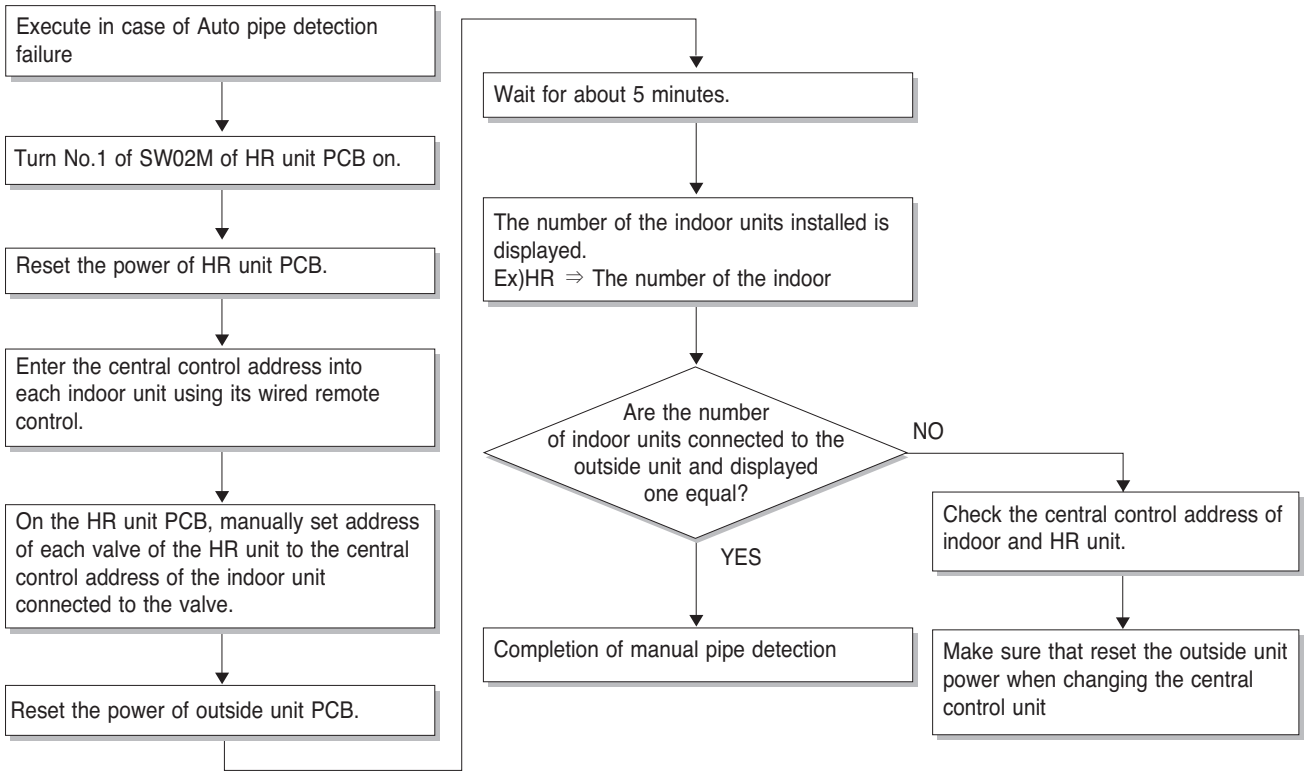


2) Flow chart of auto addressing for pipe detection



※ It is possible to be generated mode changing noise of heating and cooling which is normal. There is no mode changing noise at normal operation.

3) Flow chart of manual addressing for pipe detection



4. Example of Manual Valve Addressing(Non-Zoning setting)

(In case that an indoor unit of central control address "11" is connected to a valve #1 of an HR unit)

• Prerequisite for manual valve addressing: central control address of each indoor unit must be preset differently at its wired remote control

No.	Display and setup	Setup and contents
1		• Operation: None • Display: None
2		• Operation: Turn No.1 of SW01M on to address valve #1 • Display: Existing value saved in EEPROM is displayed in 7-SEG.
3		• Operation: Set the digit of 10 to the number in group high data of the wired remote control connected to the corresponding indoor unit to the valve #1 by pressing SW03M. • Display: Digit increasing with the times of pressing tack switch is displayed in left 7-SEG
4		• Operation: Set the digit of 1 to the number in group low data of the wired remote control connected to the corresponding indoor unit to the valve #1 by pressing SW04M. • Display: Digit increasing with the times of pressing tack switch is displayed in right 7-SEG
5		• Operation: Turn No.1 of SW01M off to save the address of valve #1 • Display: "11" displayed in 7-SEG disappears

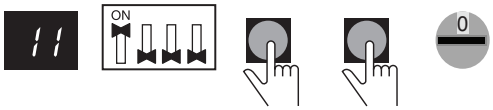
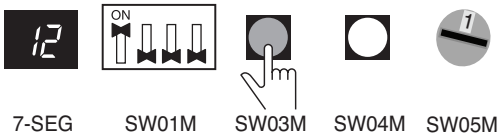
- Above setup must be done for all HR unit valves.
- The valve that is not connected with any indoor unit should be addressed with any other number than used address numbers of the valves connected with indoor units.
  (The valves does not work if the address numbers are same.)

5. Example of manual valve addressing (Zoning setting)

(In case that an indoor unit of central control address "11" is connected to a valve #1 of an HR unit)
Zoning control is connecting 2 or more indoor units at one pipe of HR unit. In case of Zoning control, in order to set controls with multiple indoor units connection uses the rotary switch. Namely, only the rotary switch changes from same valve set condition and set indoor units connection.

1) On dip switch of the corresponding valves and sets the rotary switch at 0.
2) Setting the number with tact switch.
3) In case of addition of indoor units to same port, increases 1 with the rotary switch and sets number with tact switch.
4) In case of checking the number which the corresponding valve is stored, turn on dip switch and set the number of rotary switch.
5) Indoor units set available 7 per a port(rotary switch 0~6), in case of setting above of 7 with rotary switch, it will display error.
6) Setting the rotary switch on original condition(HR unit number set conditions) after all finishing a piping setting.
7) The rotary switch set value of above number of indoor units which is connected with FF and prevents a malfunction.
(Example: The case where 3 indoor units is connected in piping 1, sets from rotary switch 0,1,2 and 3,4,5 with FF set)

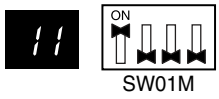
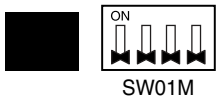
• Prerequisite for manual valve addressing: central control address of each indoor unit must be preset differently at its wired remote control.

No.	Display and setup	Setup and Contents
1		• Operation: None • Display: None
2		• Operation : Turn dip S/W No.1 on to address valve #1 • Display : Existing value saved in EEPROM is displayed in 7-SEG.
3		• Operation : Set the digit of 10(1) to the number in Group High data of the wired remote control connected to the corresponding indoor unit to the valve #1 by pressing left tack S/W. • Display : Digit increasing with the times of pressing tack S/W is displayed in left 7-SEG.
4		• Operation : SW05M : 1 • Display : Display former value.
5		• Operation : Setting No. using SW03M and SW04M, SW05M : 1 • Display : Display setting value.
6		• Operation : Turn dip S/W No.1 off to save the address of valve #1 • Display : "11" displayed in 7-SEG disappears.
7		• Operation : Return valve of addressing HR unit. • Display : None

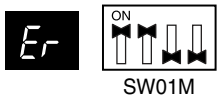
- Above setup must be done for all HR unit valves.
- The valve that is not connected with any indoor unit should be addressed with any other number than used address numbers of the valves connected with indoor units.
(The valves does not work if the address numbers are same.)

6. Example of Checking Valve Address

(In case that an indoor unit of central control address "11" is connected to a valve #1 of an HR unit)

No.	Display and setup	Setup and contents
1		• Operation: Turn dip switch No.1 on. • Display: "11" is displayed in 7-SEG
2		• Operation: Turn dip switch No.1 on. • 7-SEG disappeared

7. Identification of Manual Valve ID (Address)

No.	Display and setup	Setup and contents
1		• Operation: more than 2 dip switches turned on. • Display: "Er" is displayed in 7-SEG

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 Outside units.

CAUTION

when cutting main power of the Multi V Water4

- **Always apply main power of the Outside 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(L1)-S(L2)-T(L3) misconnection	Check compressor R(L1)-S(L2)-T(L3) connection
Outside EEV	Heating failure, frequent defrosting	Bad connector contact	Check connector
	No operating sound at applying power	Coil failure	Check resistance between terminals
	Low pressure error or discharge temperature error	EEV clogged	Service necessary

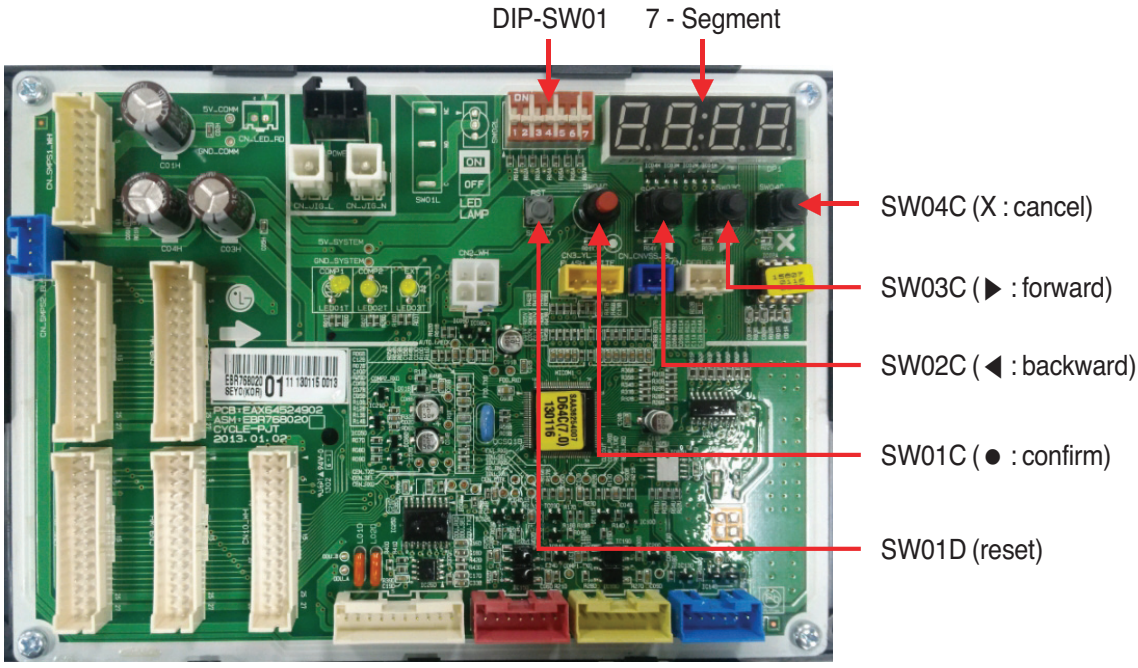
When system fault occurs, the error code is displayed at indoor unit display or remote control display, the trouble shooting guide is in the service manual

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

3. DIP Switch Setting

■ Location of setting Switch

Heat Recovery (Main PCB)



Checking the setting of Outside units

■ Checking according to dip switch setting

1. You can check the setting values of the Master Outside 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 Outside units

Checking according to dip switch setting

- You can check the setting values of the Master Outside 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 30HP)

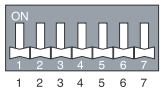
• Initial display order

Order	No	Mean
①	8~20	Master model capacity
②	10~20	Slave 1 model capacity
③	10~20	Slave 2 model capacity
④	8~54	Total capacity
⑤	1	Cooling Only
	2	Heat Pump
	3	Heat Recovery
⑥	38	380V model
	46	460V model
	22	220V model
⑦	1	BAS4

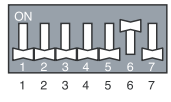
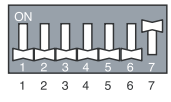
• Example) ARWB432BAS4

①	②	③	④	⑤	⑥	⑦
14	14	14	42	3	22	1

• Master Unit

Dip switch setting


• Slave Unit

Dip switch setting	ODU Setting
	Slave 1
	Slave 2

Part 5
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
Outside 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
	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?

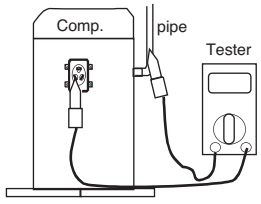
Method to measure insulation resistance
 

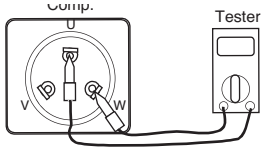
Figure 1.
Method to measure coil resistance
 

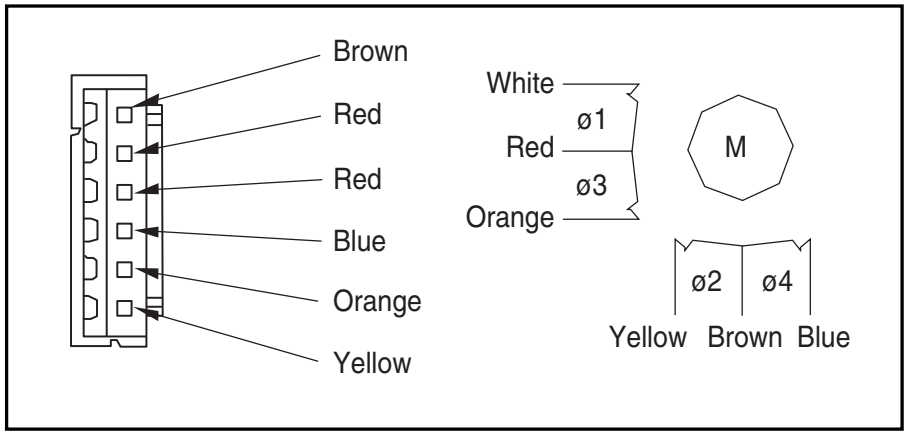
Figure 2.</td><td>1) The compressor stops and same error appears again.</td><td>* Check IPM may fail.</td></tr>
<tr><td>2) If output voltage of the inverter is stably output. *1</td><td>* Check coil resistor and insulation resistor. If normal, restart the unit. If same symptom occurs, replace the compressor.
* Insulation resistor : 50MΩ or more
* Coil resistor (below table)
JBA068MAA/JBA068MAC<table><tr><th>Temp.</th><th>75°C(167°F)</th></tr><tr><td>U-V</td><td>0.195 ±7% Ω</td></tr><tr><td>V-W</td><td>0.195 ±7% Ω</td></tr><tr><td>W-U</td><td>0.195 ±7% Ω</td></tr></table>JBA068MAA/JBA068MAC<table><tr><th>Temp.</th><th>75°C(167°F)</th></tr><tr><td>U-V</td><td>0.255 ±7% Ω</td></tr><tr><td>V-W</td><td>0.255 ±7% Ω</td></tr><tr><td>W-U</td><td>0.255 ±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 Electronic Expansion Valve



• Pulse signal output value and valve operation

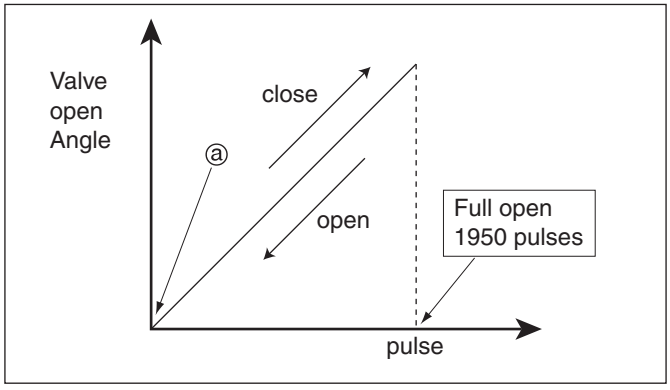
Output(ø) No.	Output state			
	1	2	3	4
ø1	ON	ON	OFF	ON
ø2	ON	ON	ON	OFF
ø3	OFF	OFF	ON	OFF
ø4	OFF	OFF	OFF	ON

• Output pulse sequence

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

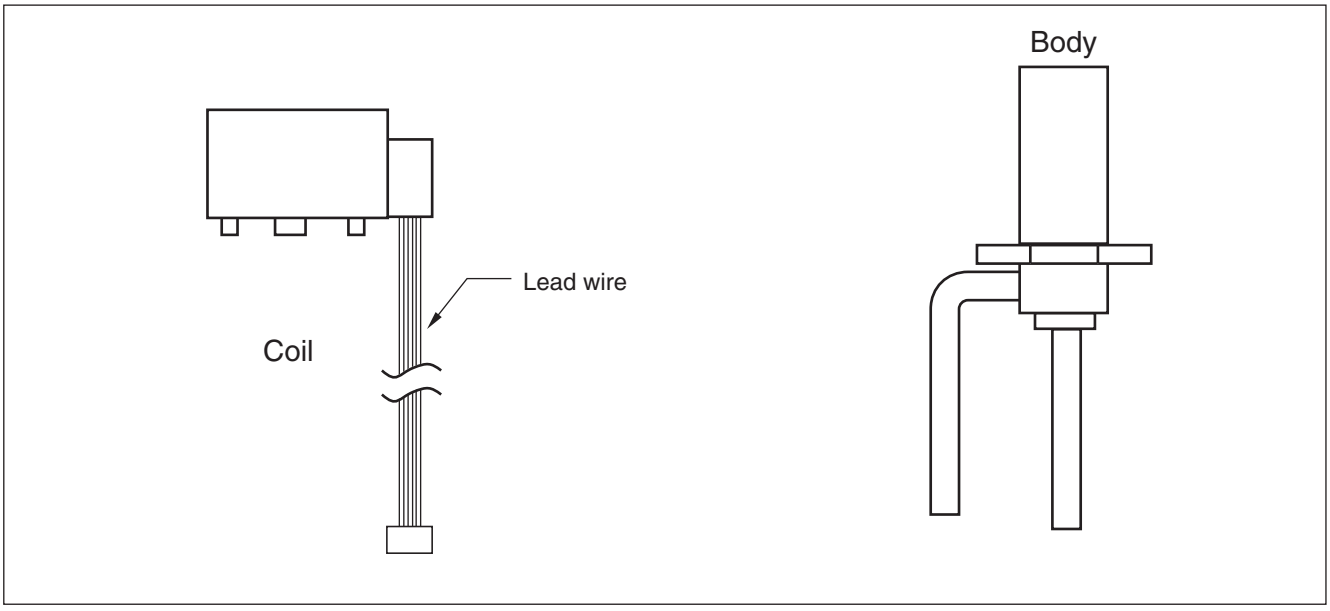
* 1. If EEV open angle does not change, all of output phase will be OFF
2. If output phase is different or continuously in the ON state, motor will not operate smoothly and start vibrating.

• EEV valve operation

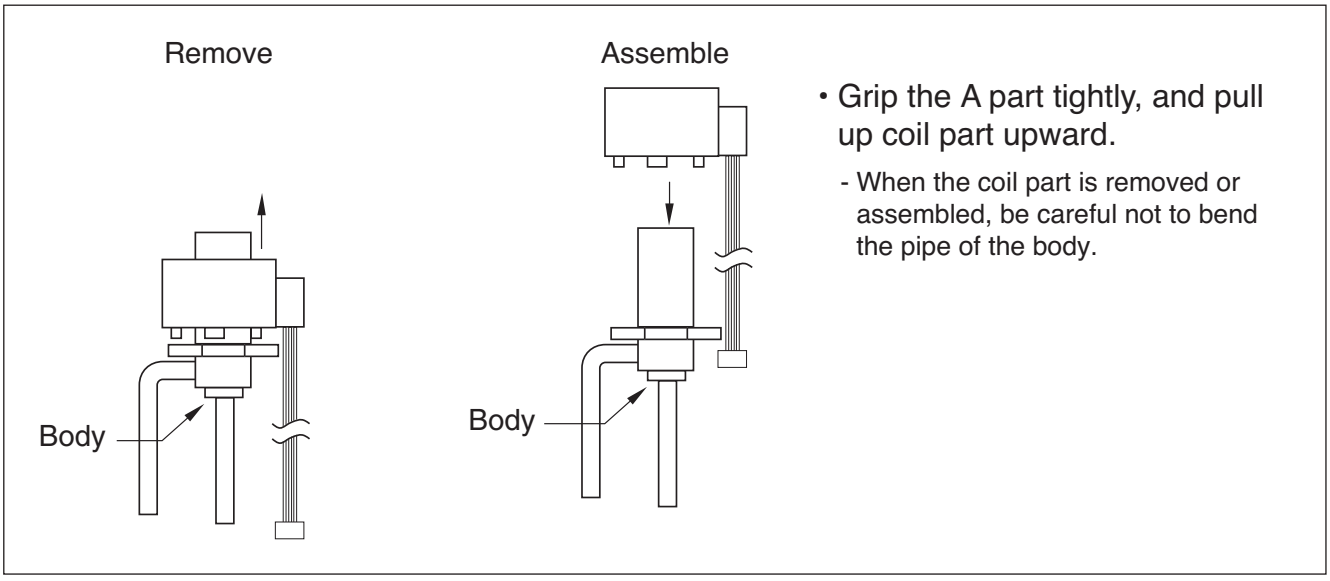


- At power ON, open angle signal of 1400 pulses output and valve position is set to ⓐ
  If valve operates smoothly, no noise and vibration occurs and if valve is closed. noise occurs.
- Noise from EEV can be confirmed by touching the EEV surface with a screw driver and listening the EEV noise.
- If liquid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

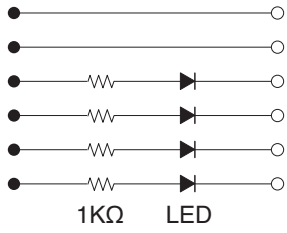
• **EEV Coil and body(Outside unit)**



• **Remove and assemble the coil**

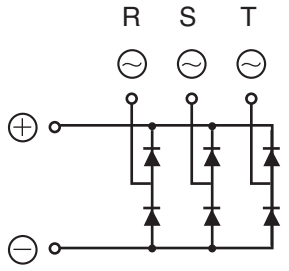


- **EEV failure check method**

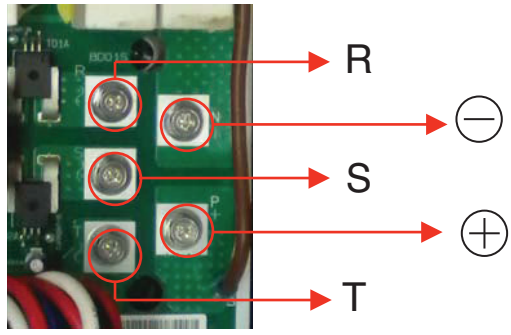
Failure mode	Diagnosis	Repair process	Unit
Microcomputer Driving circuit failure	1.Disconnect the EEV connector form control board and connect testing LED  2. Main power ON, pulse signal is out from EEV for 17 sec. If LEDs do not turn on, or are in on state continuously, then driving circuit is abnormal	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 / Outside 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	Outside 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 outside 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

2.3 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, CN COIL 1, 2 connector connected with Converter 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.
6. In case that bridge diode is damaged, check if Comp, Converter PCB assembly(IPM) is needed to be replaced.

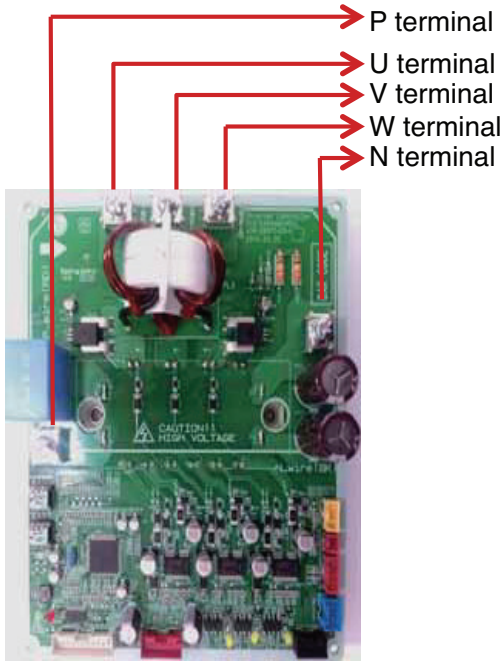
Diode terminal / Tester terminal	+ terminal: black(-)	- terminal: red(+)
R(~) : red(+)	0.4 V ~ 0.7 V	-
S(~) : red(+)	0.4 V ~ 0.7 V	-
T(~) : red(+)	0.4 V ~ 0.7 V	-
R(~) : black(-)	-	0.4 V ~ 0.7 V
S(~) : black(-)	-	0.4 V ~ 0.7 V
T(~) : black(-)	-	0.4 V ~ 0.7 V

✻ 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.**

2.4 Inverter IGBT Checking Method



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 fan Comp PCB
3. Set multi tester to resistance mode.
4. If the value between P and N terminal of IPM is short(0Ω) or open(hundreds MΩ), PCB needs to be replaced.(IPM damaged)
5. In the measured value with resistance mode should be within 2.3K Ω ±10%[25°C(77°F)].
6. In case measured value is different from the table, PCB needs to be replaced.(PCB damaged).

	P terminal : black (-)	**N terminal : red (-)**
U terminal : red(+)	2.3K Ω ± 10%[25°C(77°F)]	3.0K Ω ± 10%[25°C(77°F)]
V terminal : red(+)	2.3K Ω ± 10%[25°C(77°F)]	3.0K Ω ± 10%[25°C(77°F)]
W terminal : red(+)	2.3K Ω ± 10%[25°C(77°F)]	3.0K Ω ± 10%[25°C(77°F)]
	P terminal : red(+)	**N terminal : red (+)**
U terminal : black(-)	3.0K Ω ± 10%[25°C(77°F)]	2.3K Ω ± 10%[25°C(77°F)]
V terminal : black(-)	3.0K Ω ± 10%[25°C(77°F)]	2.3K Ω ± 10%[25°C(77°F)]
W terminal : black(-)	3.0K Ω ± 10%[25°C(77°F)]	2.3K Ω ± 10%[25°C(77°F)]

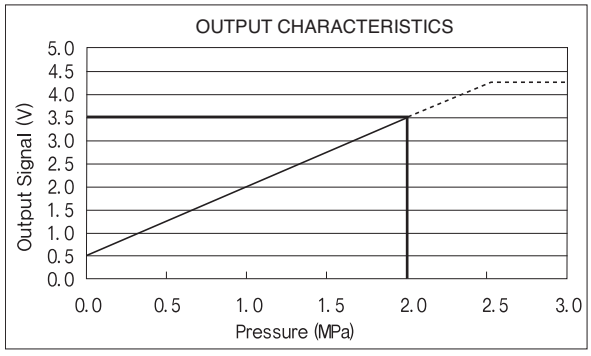
✻ Red(+) and black(-) are the measuring terminals of multi tester.

2.5 Pressure Sensor(High/Low Pressure Sensor)

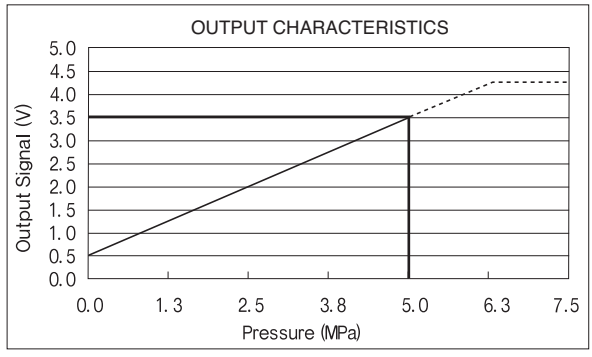
Connect manifold gauge to the service valve of Outside unit, and compare the output of high pressure sensor to the output of low pressure sensor to detect the defect.

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.

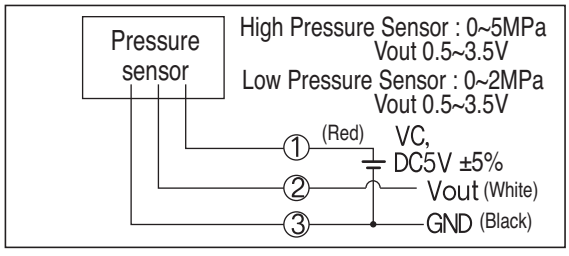
<Low Pressure Sensor>



<High Pressure Sensor>



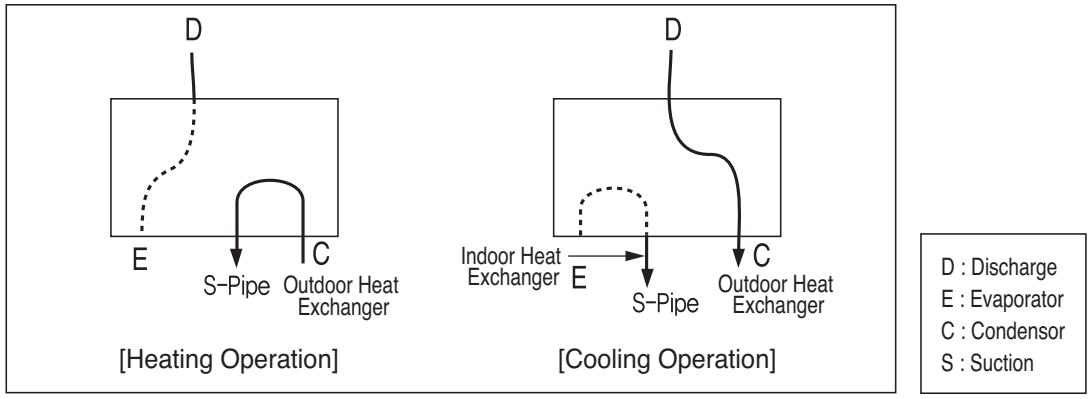
1) If the pressure of manifold gauge is 0~1kg/cm², it indicates the pressure got lower due to the leakage of refrigerant. Find the place of leakage and fix it.
2) If the difference of the outputs of high and low pressure is in the range of 1kg/cm², the pressure sensor is normal.
3) If the difference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

2.6 Reverse Valve

1. Keep it off before the Outside 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).

2.7 Temperature Sensor

1) outdoor temperature sensor : TH1

2) Pipe temperature sensor : TH2

3) Discharge pipe(D-pipe) temperature sensor : TH3
   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.

	TH1	TH2	TH3
Resistance	10KΩ±1%[25°C(77°F)]	5KΩ±1%[25°C(77°F)]	200KΩ±1%[25°C(77°F)]
	1.07KΩ±3.3%[85°C(185°F)]	535KΩ±3.3%[85°C(185°F)]	28KΩ±7.7%[85°C(185°F)]

2.8 Others

Electrolytic capacitor and resistor for voltage distribution

1) Disconnect an terminal of voltage distribution resistor from each DC link electrolytic capacitor
2) Set the multi meter to resistance mode, connect the probe to +,- terminal of the capacitor. If the estimated resistance value is increase continuously without short(value is 0), then the resistor is normal
3) Set the multi meter to resistance mode, confirm that the resistance value of the resistor is around 270 kOhm

Check and replace inferior components

3. Self-diagnosis function

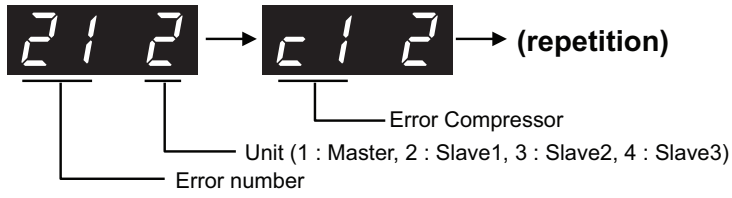
Error Indicator

- 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 Outside 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. Indicates unit number.

Ex) 211 : No.21 error of master unit
213 : No.21 error of slave2
1051 : No.105 error of master unit



❉ Refer to the DX-Venitilation manual for DX-Venitilation error code

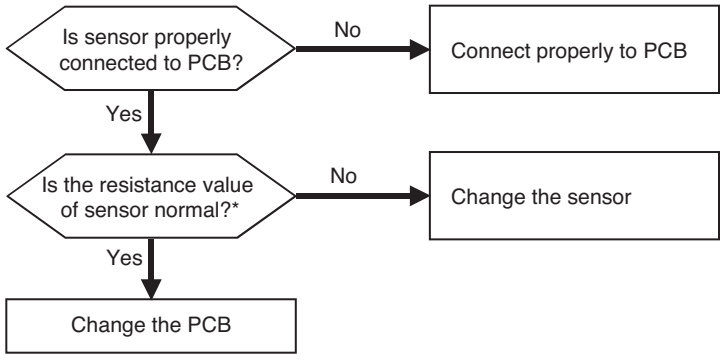
Display				Title	Cause of Error
Indoor unit related error	0	1	-	Air temperature sensor of indoor unit	Communication error: indoor unit ↔ main PCB of outdoor.
	0	2	-	Inlet pipe temperature sensor of indoor unit	Air temperature sensor of indoor unit is open or short
	0	3	-	Communication error:wired remote controller ↔ indoor unit	Inlet pipe temperature sensor of indoor unit is open or short
	0	4	-	Drain pump	Failing to receive wired remote controller signal in indoor unit PCB
	0	5	-	Communication error : Outside unit ↔ indoor unit	Malfunction of drain pump
	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
	1	7	-	Inlet Air temperature sensor of FAU	Air temperature sensor of indoor unit is open or short
Outside unit related error	2	1	*	Master outside unit inverter compressor IGBT Fault	Master outside unit inverter compressor drive IPM error
	2	2	*	Inverter Board Input Over Current(RMS) of Master outside Unit	Master Outside Unit Inverter Board Input Current excess (RMS)
	2	3	*	Master outside unit inverter compressor DC link under-voltage	DC voltage is not charged after master outside unit operating relay is turned on
	2	4	*	Master outside unit high pressure switch	Compressor maintenance by master outside unit high pressure switch Flow rate insufficiency or flow switch trouble of master outside unit
	2	5	*	Master outside unit input voltage over-voltage/under-voltage	Master outside unit input voltage over-voltage or under-voltage
	2	6	*	Master outside unit inverter compressor operation failure error	Initial operation failure due to master outside unit inverter compressor error
	2	8	*	Master outside unit inverter DC link over-voltage error	Compressor turned Off due to master outside unit inverter DC voltage over-charge
	2	9	*	Master outside unit inverter compressor overcurrent	Master outside unit inverter compressor error or operating component (IGBT) error operation
	3	2	*	Master outside unit inverter compressordischarge temperature over-rise	Compressor turned off due to master outside unit inverter compressor discharge temperature over-rise Flow rate insufficiency or flow switch trouble of master outside unit

Display				Title	Cause of Error
Outside unit related error	3	4	*	Master outside unit high pressure over-rise	Compressor turned off due to master outside unit high pressure over-rise Flow rate insufficiency or flow switch trouble of master outside unit
	3	5	*	Master outside unit low pressure over-drop.	Compressor turned off due to master outside unit low pressure overdrop.
	3	6	*	Master Outside Unit Low Compression Ratio Limited	Master Outside Unit stayed under low Compression limit for 3 minutes
	3	9	*	Master Outside unit Communication error between Master outside unit PFC and inverter board	Master Outside unit inverter compressor current detection (CT) sensor disconnection or short circuit
	4	0	*	Master outside unit inverter compressor CT sensor error	Master outside unit inverter compressor current detection (CT) sensor disconnection or short circuit
	4	1	*	Master outside unit inverter compressor discharge temperature sensor error	Master outside unit inverter compressor discharge temperature sensor disconnection or short circuit
	4	2	*	Master Outside Unit Low Pressure Sensor Fault	Master Outside Unit Low Pressure Sensor open or short
	4	3	*	Master Outside Unit High Pressure Sensor Fault	Master Outside Unit High Pressure Sensor open or short
	4	4	*	Master Outside unit air temperature sensor error	Master Outside unit air temperature sensor disconnection or short circuit
	4	6	*	Master outside unit suction temperature sensor error	Master outside unit suction temperature sensor disconnection or short circuit
	4	9	*	Master outside unit IGBT temperature sensor error	Master out side unit IGBT temperature sensor disconnection or short circuit
	5	0	*	Master outside unit 3 phase power missing	Master outside unit power line phase missing
	5	1	*	Over-capacity (Indoor unit capacity sum is excessive) connection	Excessive connection of indoor unit connection display value (Different from outside unit)
	5	2	*	Communication error: inverter PCB → Main PCB	When the inverter controller signal is not received from the master outside unit inverter controller
	5	3	*	Communication error: indoor unit → Main PCB of Outside Unit	When the indoor unit control signal is not received from the master Outside unit controller
	5	7	*	Communication error: Main PCB → inverter PCB	Failing to receive inverter contoroller signal at Master Outside Unit controller
	5	9	*	Wrong setting between master and slave outside unit	When geothermal mode setting is different(Fn 2 setting)
	6	0	*	Master outside unit inverter PCB EEPROM error	Master outside unit inverter PCB EEPROM ACCESS error
	6	2	*	Master outside unit inverter IGBT over-rise error	Master outside unit inverter IGBT when the temperature rises above 110 °C
	6	5	*	Master outside unit inverter IGBT temperature sensor error	Master outside unit inverter IGBT temperature sensor disconnection or short circuit
	7	1	*	PFC CT Sensor Error of Master Outside Unit	Master Outside Unit PFC CT Sensor open or short
	8	6	*	Master outside unit master PCB EEPROM error	Communication error between master outside unit master MICOM andEEPROM or EEPROM missing
	8	8	*	PFC PCB EEPROM error	Communication error between master outside unit master PFC and EEPROM or EEPROM missing

Display					Title	Cause of Error
Outside unit related error	1	0	4	*	Communication Error Between Master Outside Unit and Other Outside Unit	Failing to receive Slave Unit signal at main PCB of Master Outside Unit
	1	1	3	*	Master Outside Unit Liquid pipe Temperature Sensor Error	Liquid pipe temperature sensor of Master Outside Unit is open or short
	1	1	5	*	Master Outside Unit Subcooling Outlet Temperature Sensor Error	Master Outside Unit Subcooling Outlet Temperature Sensor open or short
	1	1	6	*	Master Outside Unit Oil Level Sensor Error	Oil Level Sensor of Master Outside Unit is open or short
	1	4	5	*	Master outside unit Main Board - External Board communication Error	Master outside unit Main Board - External Board communication Error
	1	5	1	*	Failure of operation mode conversion at Master Outside Unit	Failure of operation mode conversion at Master Outside Unit
	1	8	0	*	Plate type heat exchanger freeze prevention	Plate type heat exchanger freeze prevention error
	1	8	1	*	Water temperature sensor error	Water temperature sensor open/short
	1	8	2	*	Communication error between MICOMs of external pcb	Communication error between main MICOM and sub MICOM of external pcb
	2	0	0	1	Searching pipe Error	Failure of automatic addressing of valves
	2	0	1	#h	HR unit1 Liqiud sensor error	Liquid pipe sensor of HR unit open or short
	2	0	2	#h	HR unit1 Sub Cooling Pipe sensor error	Sub Cooling Pipe In sensor of HR unit open or short
	2	0	3	#h	HR unit1 Sub Cooling Pipe Out sensor error	Sub Cooling Pipe Out sensor of HR unit. open or short
	2	0	4	#h	Communication error	Failing to receive HR unit signal at outside unit

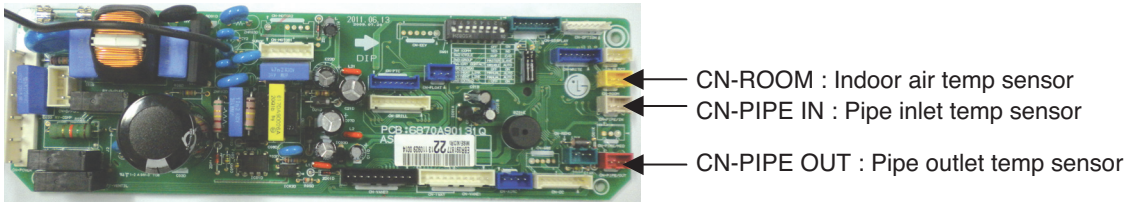
Error No.	Error Type	Error Point	Main Reasons
01	Indoor unit air sensor error	Indoor unit sensor is open/short	1. Indoor unit PCB wrong connection 2. Indoor unit PCB failure 3. Sensor problem (main reason)
01(FAU)	FAU Outlet air sensor error		
02	Indoor unit pipe inlet sensor error		
06	Indoor unit pipe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

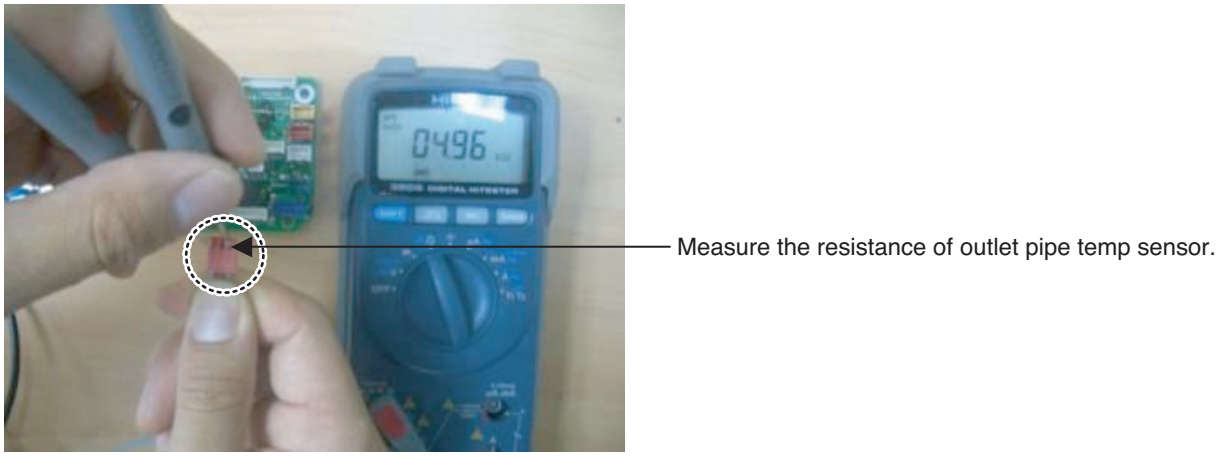
■ Error diagnosis and countermeasure flow chart



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

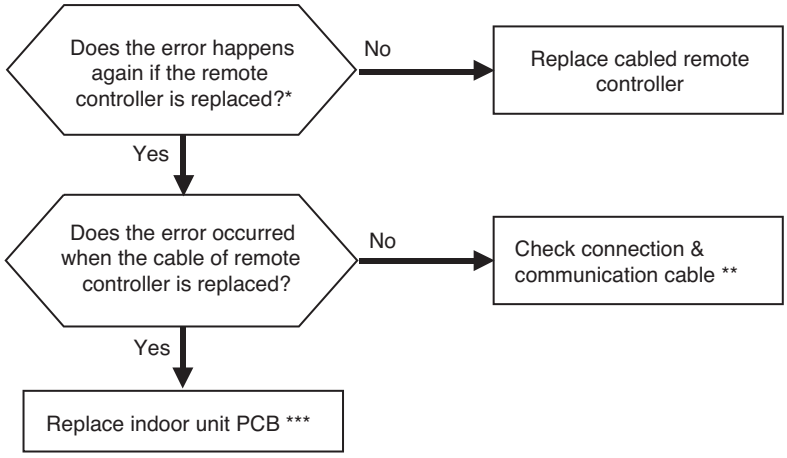
Refer: Resistance value maybe change according to temperature of temp sensor,
It shows according to criteria of current temperature(±5% margin) ➔ Normal
Air temp sensor: 10°C(50°F) = 20.7kΩ : 25°C(77°F) = 10kΩ : 50°C(122°F) = 3.4kΩ
Pipe temp sensor: 10°C(50°F) = 10kΩ : 25°C(77°F) = 5kΩ : 50°C(122°F) = 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

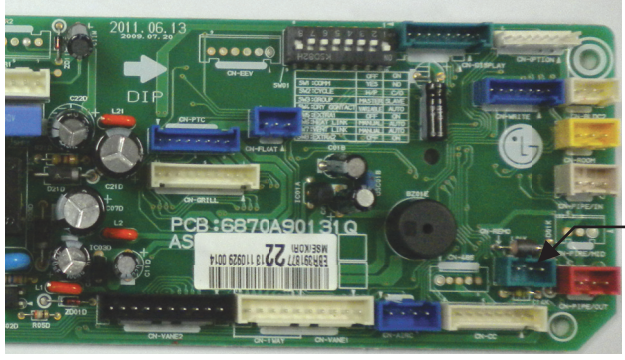
■ Error diagnosis and countermeasure flow chart



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

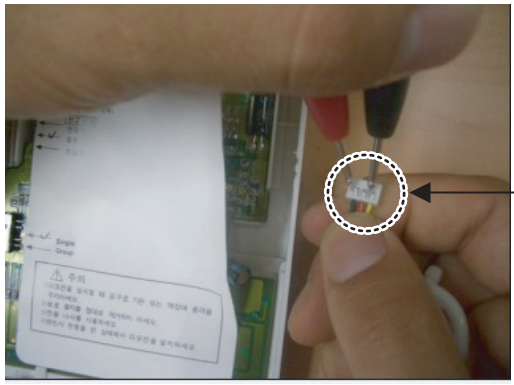
** Check cable : Contact failure of connected portion or extension of cable are main cause
Check any surrounded noise (check the distance with main power cable)
➔ make safe distance from the devices generate electromagnetic wave

*** 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

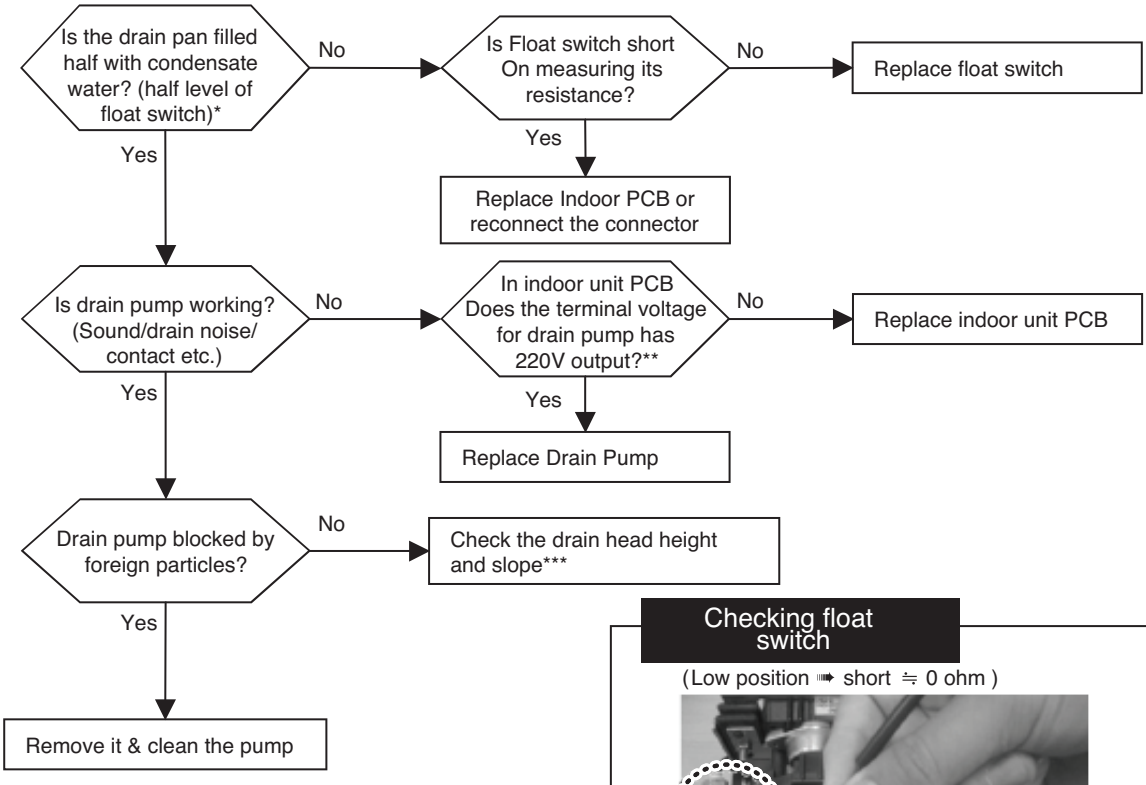
※ The PCB can differ from model to model.
Check from the right source.



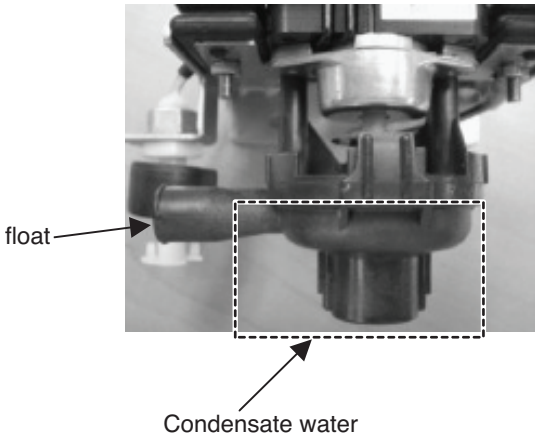
Checking communication cable connection status

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

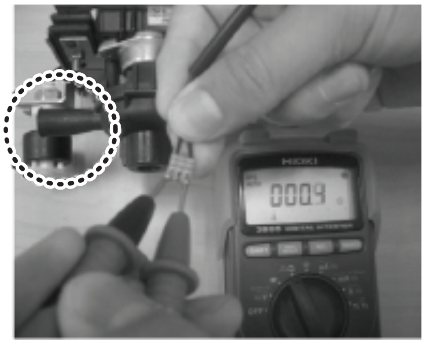


* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.

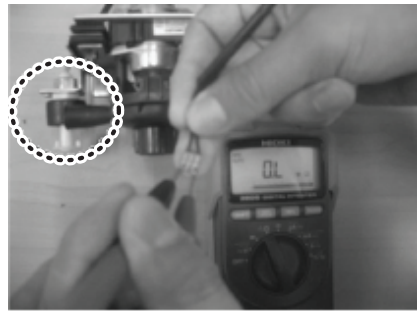


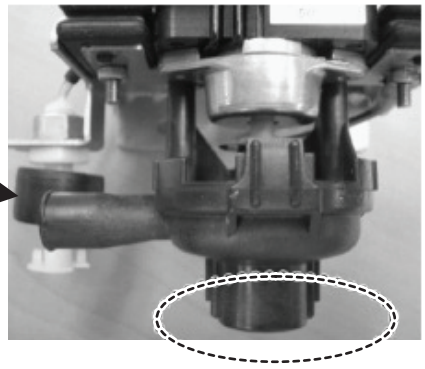
Checking float switch

(Low position ➠ short ≒ 0 ohm)

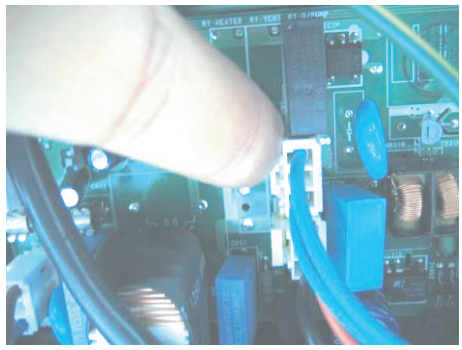


(High position ➠ Open)





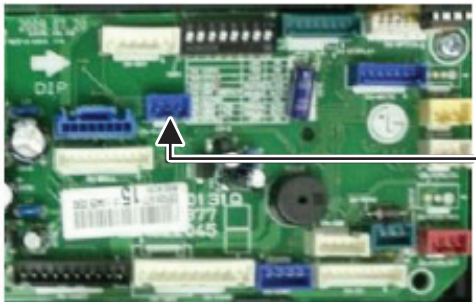
A:Point to check rotating



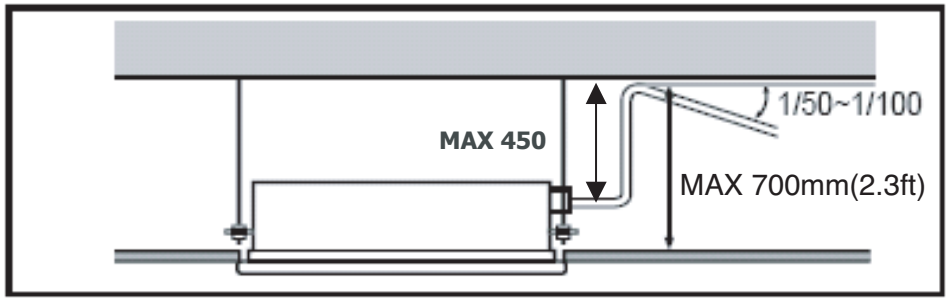
*** Indoor PCB drain pump connector

(Check input of 220V)

(Marked as **CN-DPUMP)**

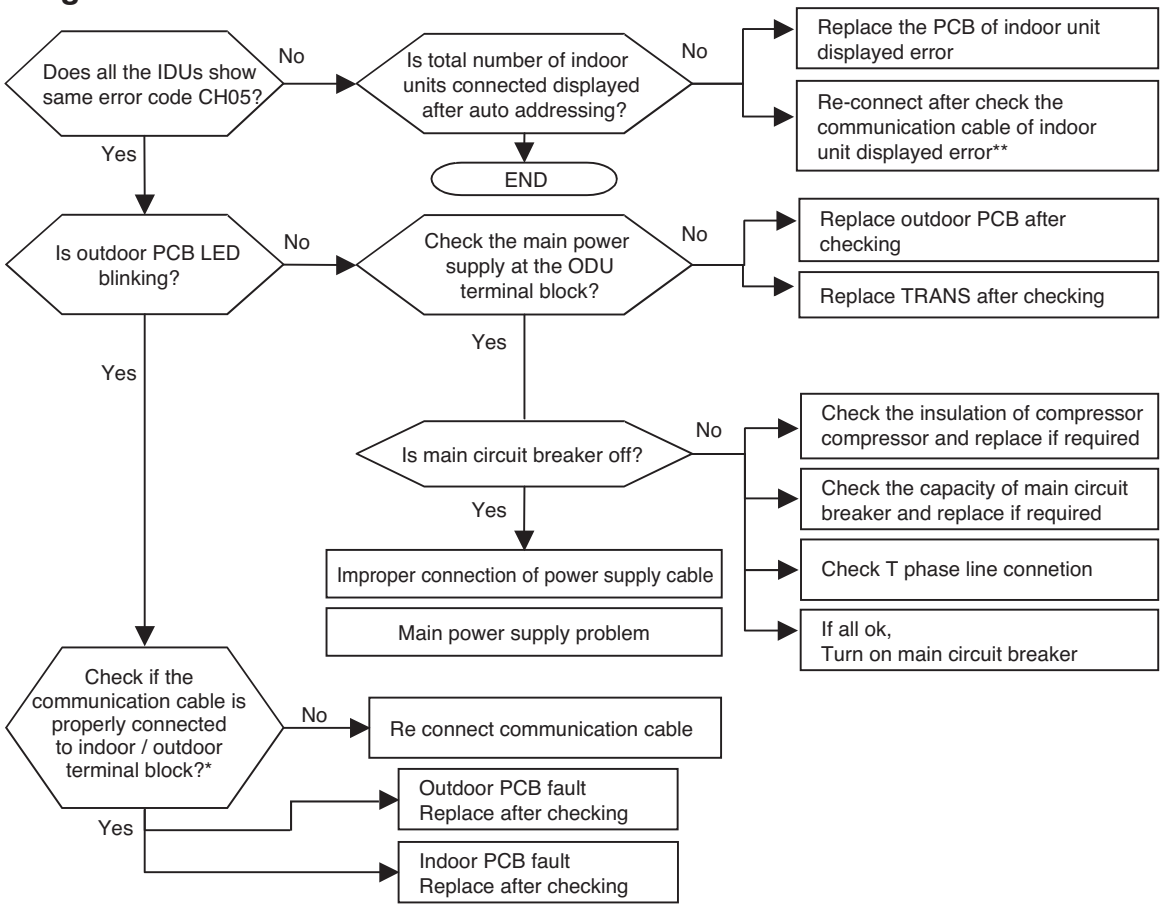


[***] Standard of drain pipe head height / slope

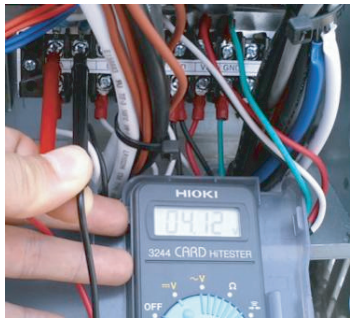


Error No.	Error Type	Error Point	Main Reasons
05	Indoor & Outside unit communication error	No signal communication between indoor & Outside units.	1. Auto addressing is not done 2. Communication cable is not connected 3. Short circuit of communication cable 4. Indoor unit communication circuit fault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

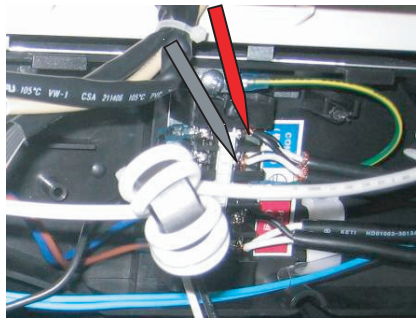
■ Error diagnosis and countermeasure flow chart



* (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 outside unit is normal



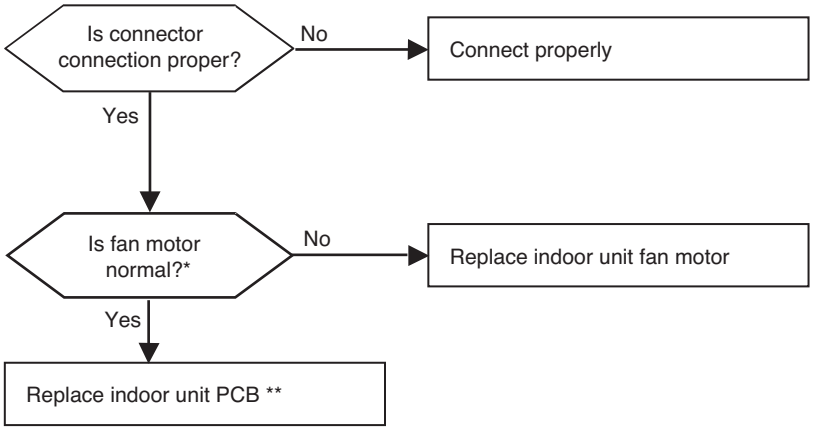
Error No.	Error Type	Error Point	Main Reasons
09	Indoor unit EEPROM error	Error occur in EEPROM of the Indoor PCB	1. Error developed in communication between the micro- processor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage

■ Error diagnosis and countermeasure flow chart

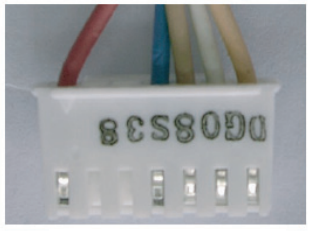
- Replace the indoor unit PCB, and then make sure to perform Auto addressing and input the address of central control

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



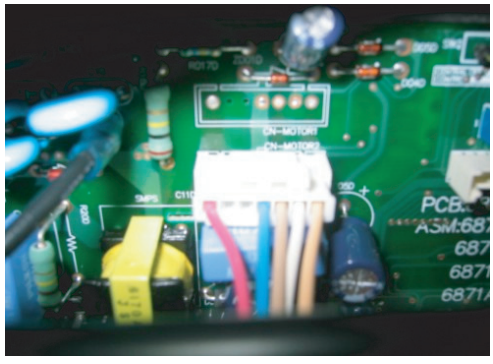
* It is normal when check hall sensor of indoor fan motor as shown below



Each termainl with the tester

Tester		Normal resistance(±10%)
①	④	∞
⑤	④	hundreds kΩ
⑥	④	∞
⑦	④	hundreds kΩ

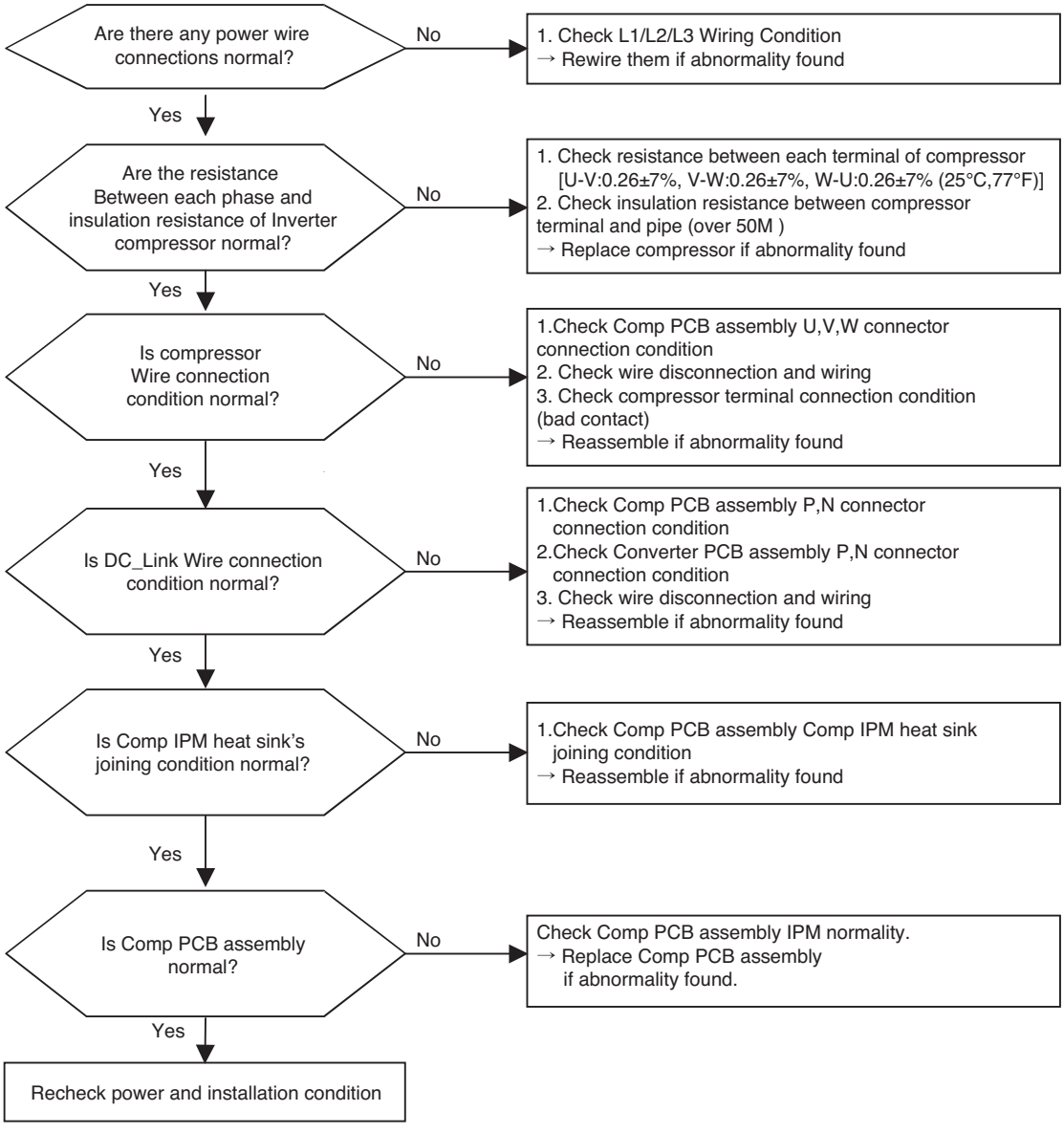
<Checking connection state of fan motor connector>



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

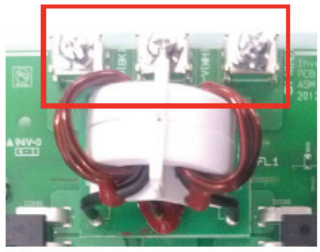
Error No.	Error Type	Error Point	Main Reasons
21* Master 211 Slave1 212 Slave2 213	Comp PCB Assy IPM Fault occur	IPM self protection circuit activation (Overcurrent/IPM overheating/Vcc low voltage)	1.Over current detection at Inverter compressor(U,V,W) 2.Compressor damaged (insulation damaged/Motor damaged) 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

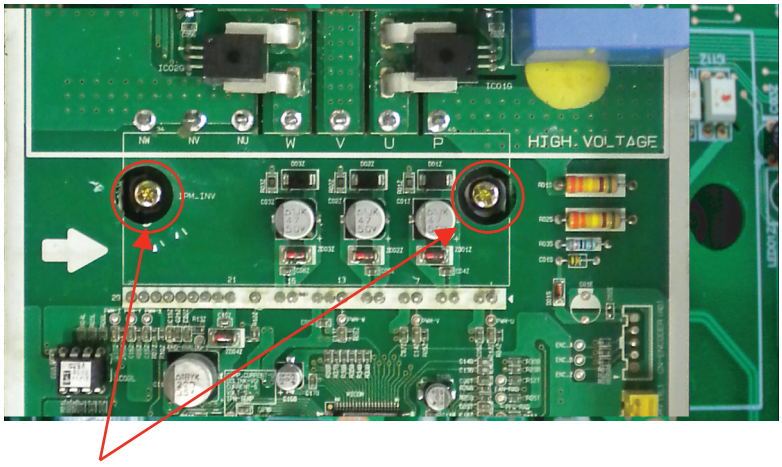


* Measuring resistance between each terminal of compressor

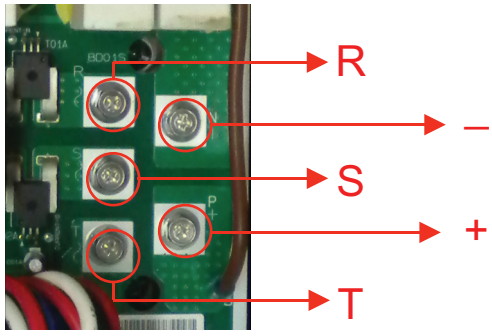
* Compressor wire connector connection point



* IPM joining point



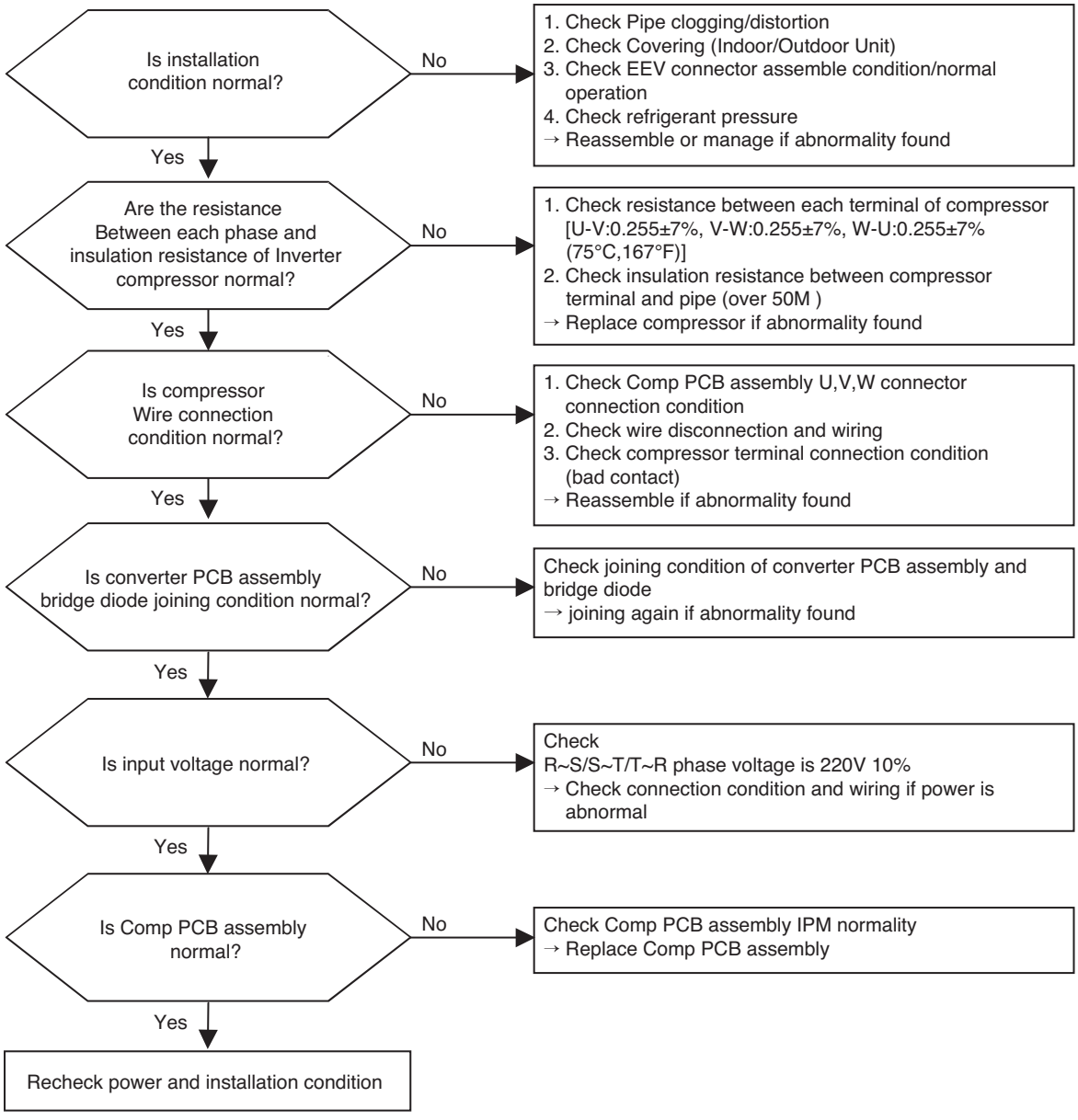
Check joining conditon



Check DC_Link Connector joining condition

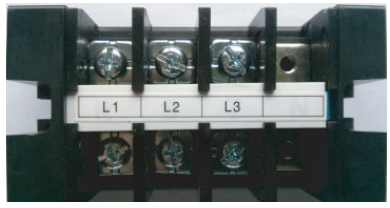
Error No.	Error Type	Error Point	Main Reasons
22* Master 221 Slave1 222 Slave2 223	AC Input Current Over Error	Converter PCB Assembly input 3 phase power current is over limited value(24A)	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. Power Line Misconnection 5. Converter PCB Assembly damage (Input current sensing part)

■ Error Diagnosis and Countermeasure Flow Chart

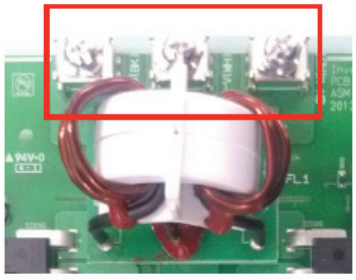


* Measuring resistance between each terminal of compressor

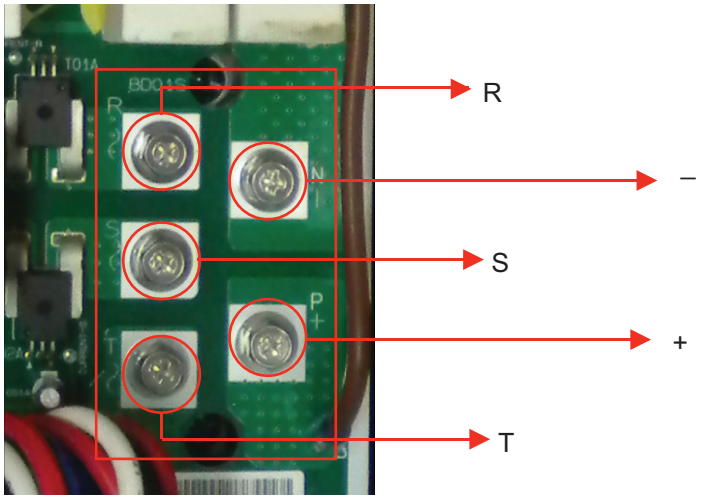
* Measuring input voltage



* Compressor wire connector connection

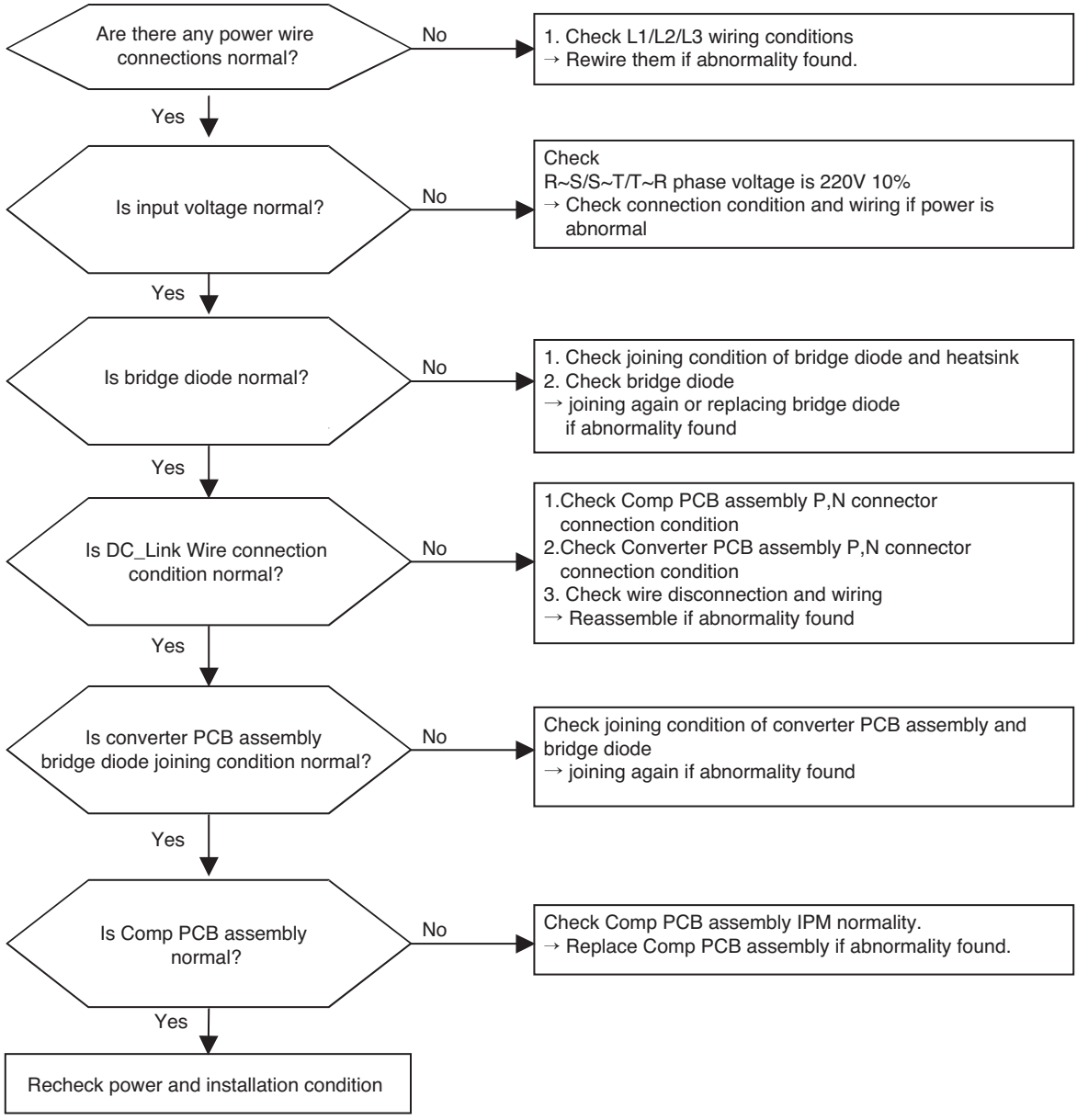


* Check DC_Link Connector joining condition

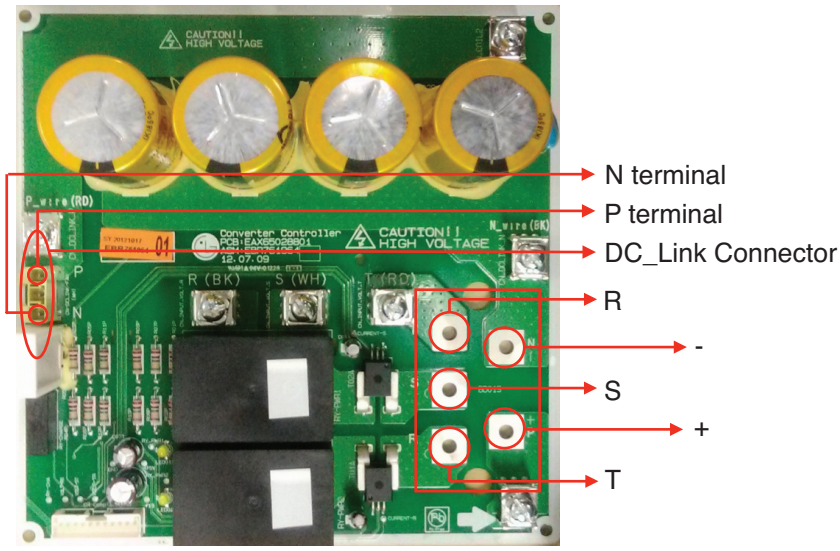


Error No.	Error Type	Error Point	Main Reasons
23* Master 231 Slave1 232 Slave2 233	Inverter Compressor DC Link Low Voltage	DC Voltage isn't charged after starting relay on	1. DC Link terminal misconnection/terminal contact fault 2. Starting relay damage 3. Condenser damage 4. Comp PCB assembly damage (DC Link voltage sensing part) 5. Input voltage low

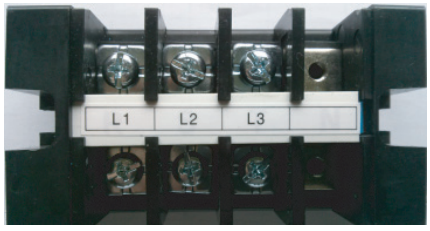
■ Error Diagnosis and Countermeasure Flow Chart



* Check DC_Link Connector joining condition

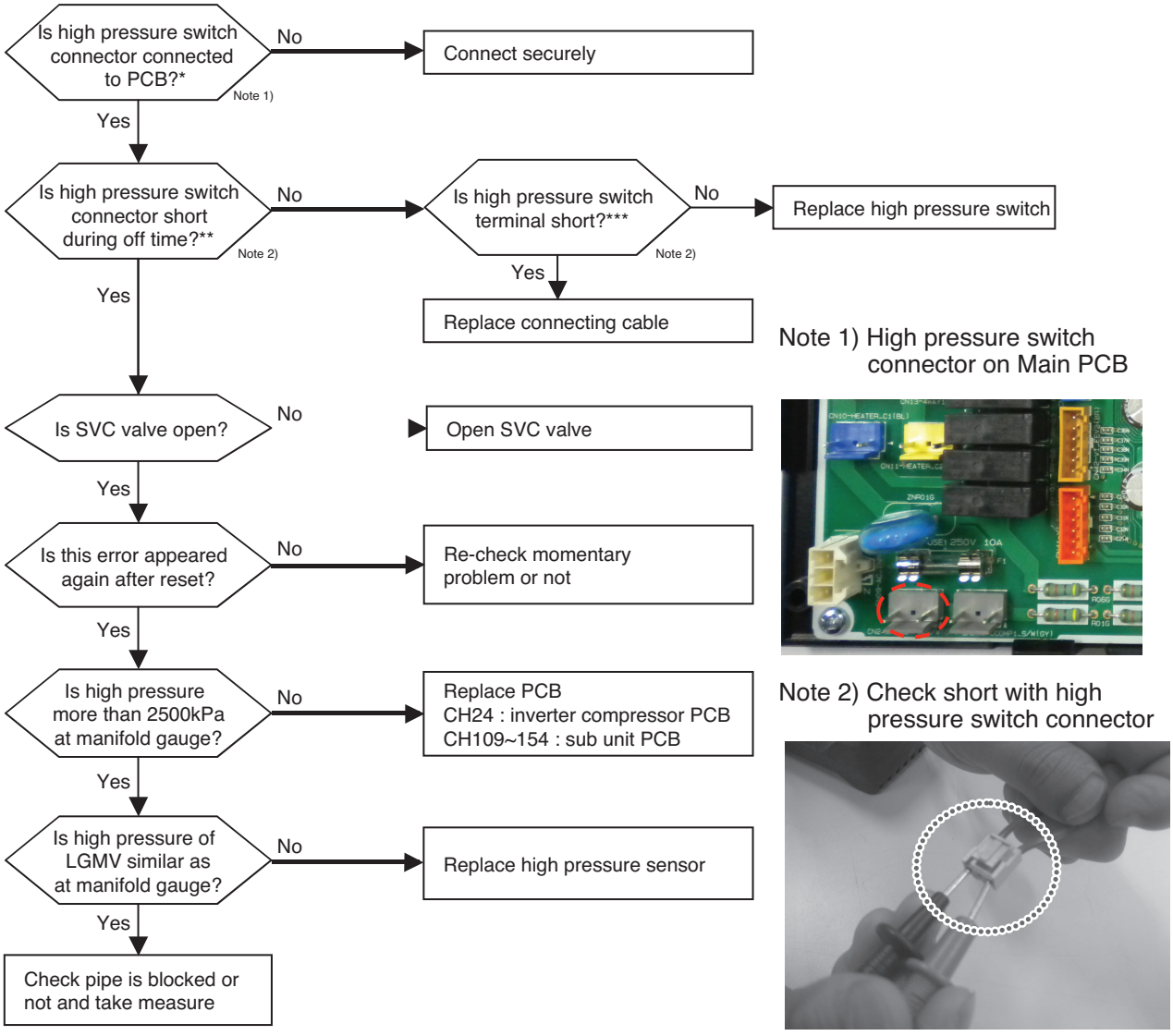


* Measuring input voltage



Error No.	Error Type	Error Point	Main Reasons
24* Master 241 Slave1 242 Slave2 243	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

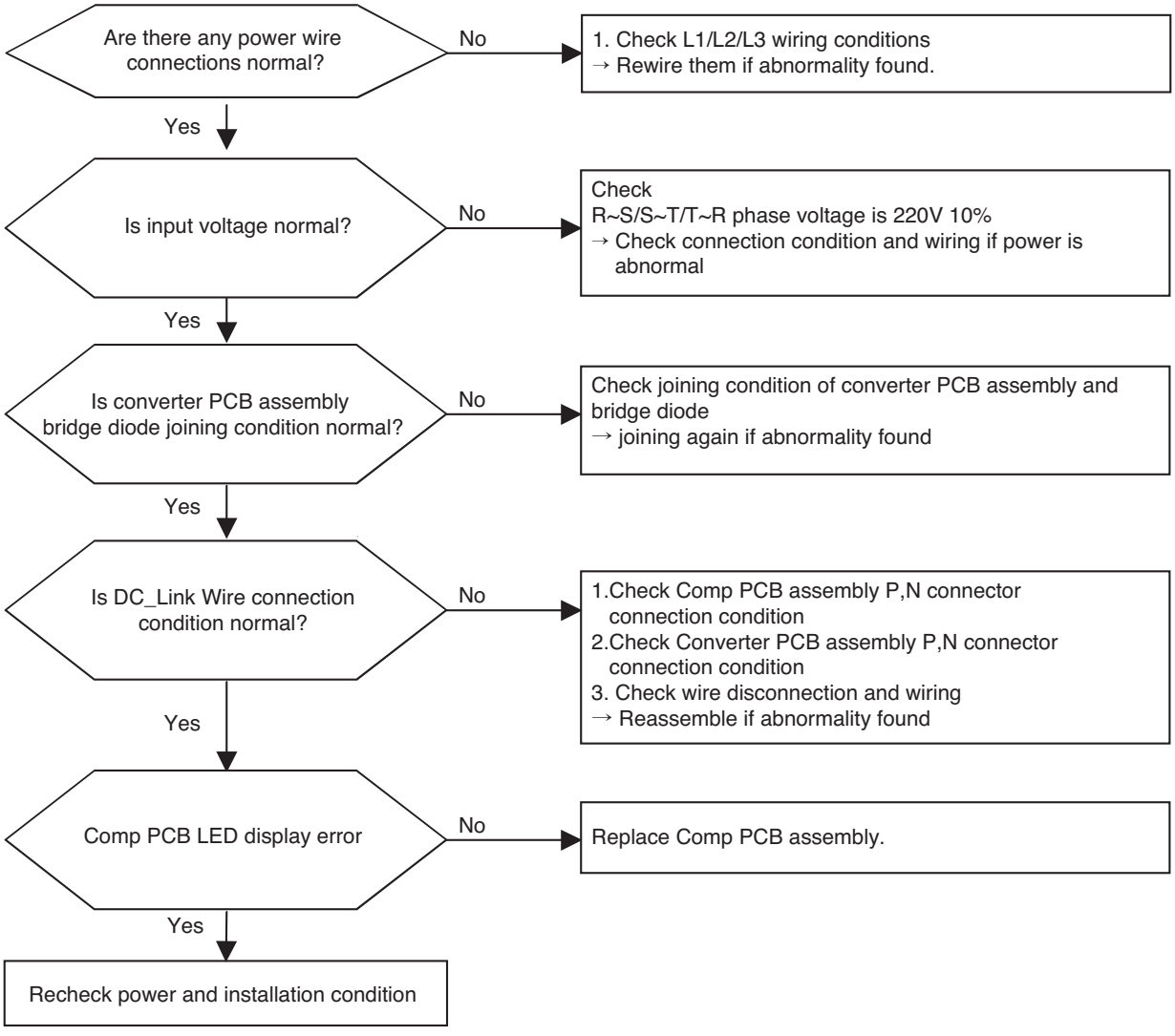


Note 1) High pressure switch connector on Main PCB

Note 2) Check short with high pressure switch connector

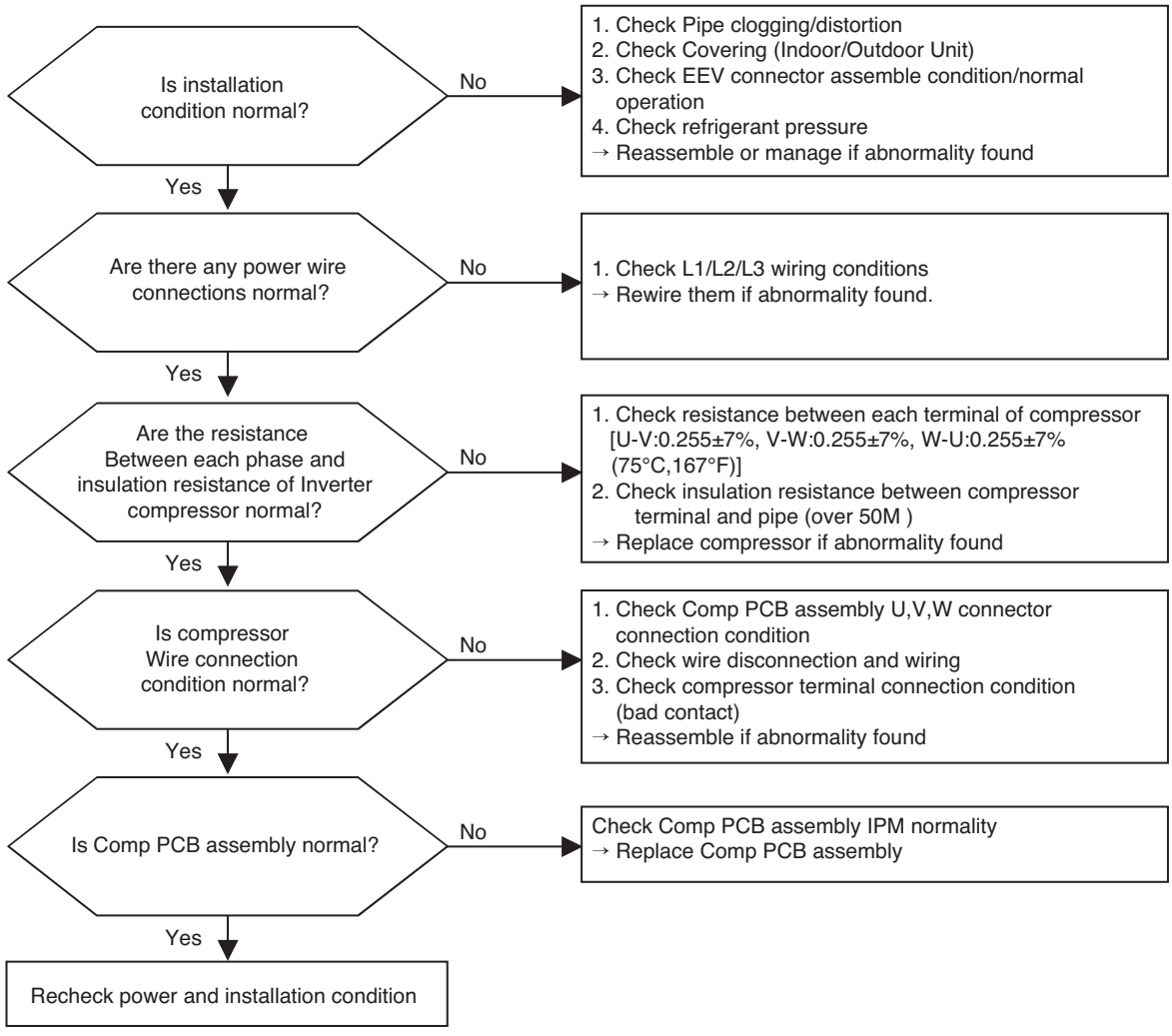
Error No.	Error Type	Error Point	Main Reasons
25* Master 251 Slave1 252 Slave2 253	Input Voltage high/low	Input voltage is over limited value of the product. (414V or less, 506 or more)	1. Input voltage abnormal (R-T) 2. Outdoor unit Converter PCB assembly damage (input voltage sensing part) 3. N phase line disconnection

■ Error Diagnosis and Countermeasure Flow Chart



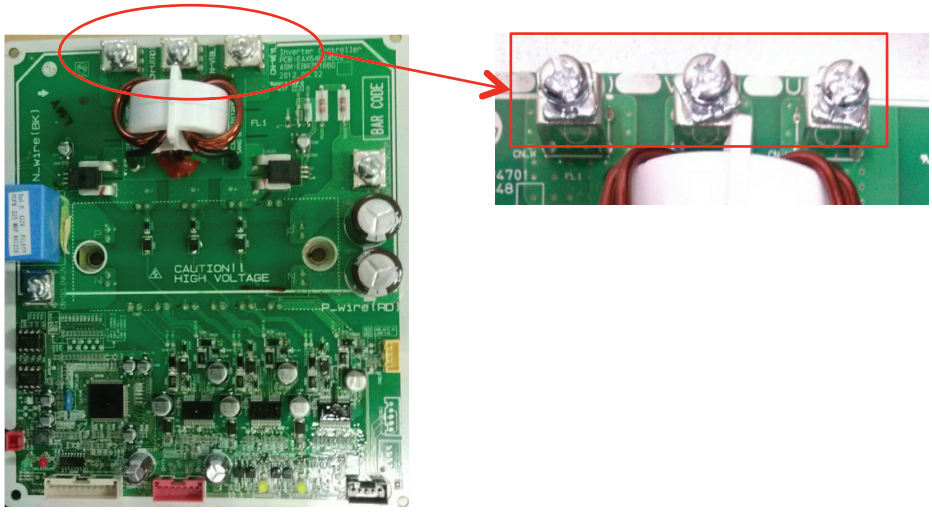
Error No.	Error Type	Error Point	Main Reasons
26* Master 261 Slave1 262 Slave2 263	Inverter compressor starting failure Error	Starting failure because of compressor abnormality	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage (Insulation damage/Motor damage) 3. Compressor wiring fault 4. ODU Comp PCB damage (CT)

■ Error Diagnosis and Countermeasure Flow Chart



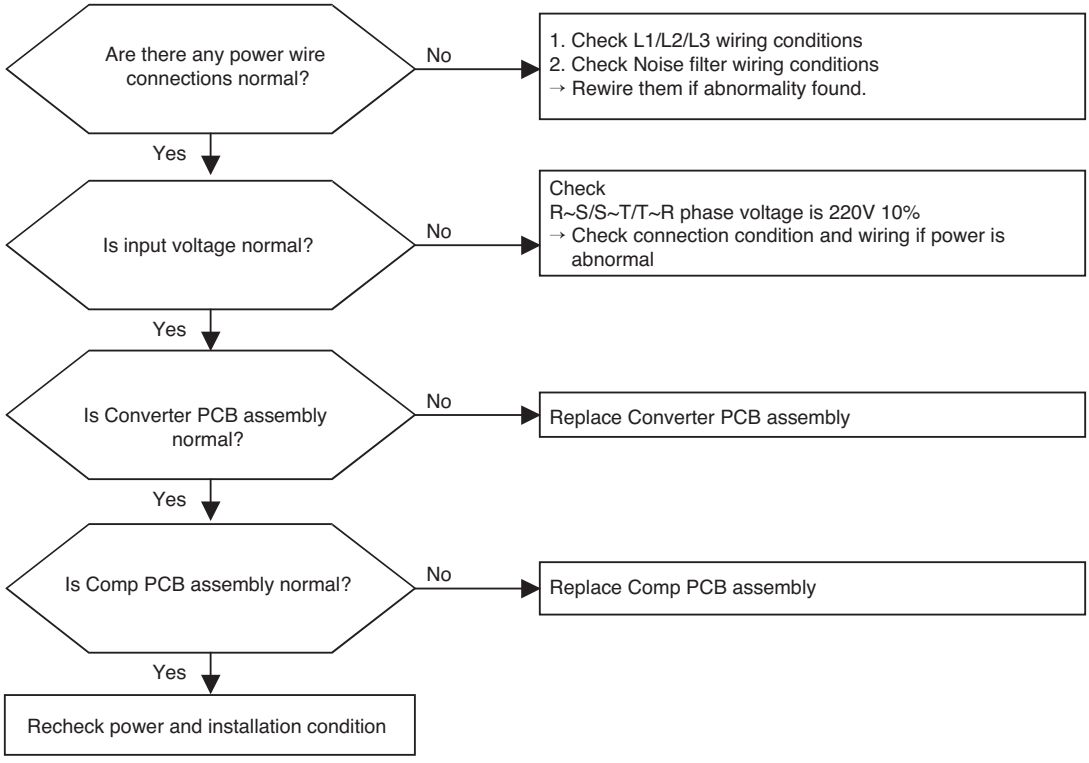
* Measuring resistance between each terminal of compressor

* Compressor wire connection

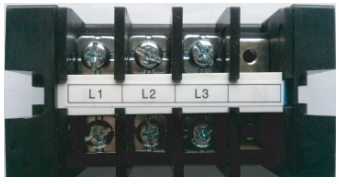


Error No.	Error Type	Error Point	Main Reasons
28* Master 281 Slave1 282 Slave2 283	Inverter DC link high voltage error	Inv PCB DC link voltage supplied over 780V	1. Input voltage abnormal (R-T) 2. ODU Comp PCB damage (DC Link voltage sensing part)

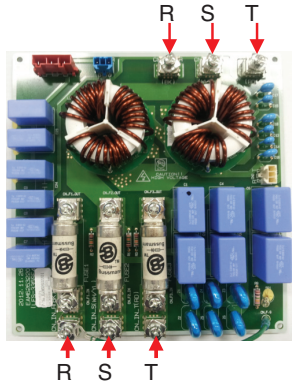
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring input voltage

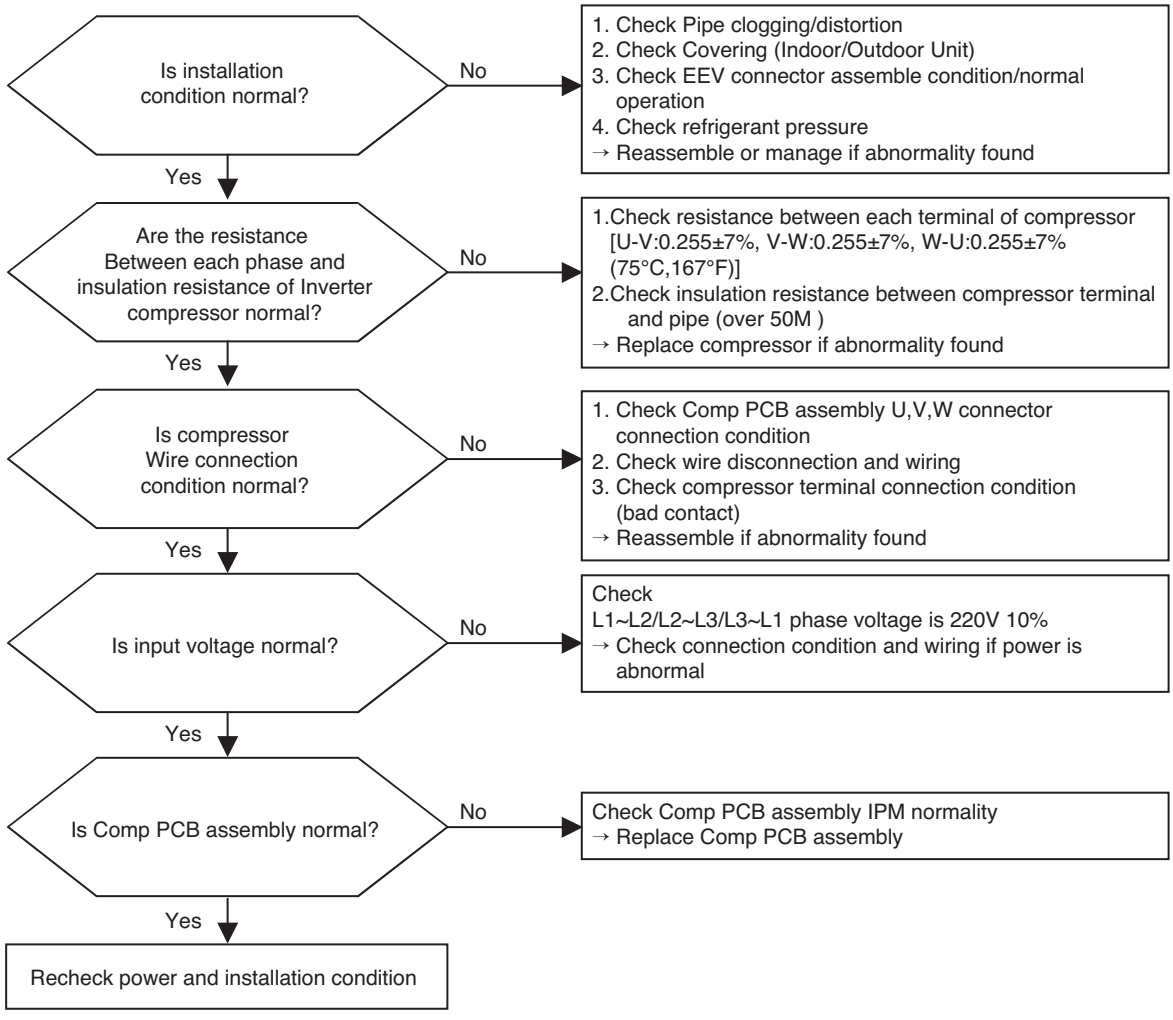


* Noise filter wiring



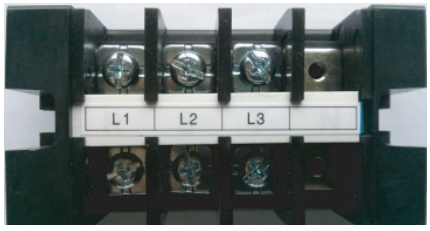
Error No.	Error Type	Error Point	Main Reasons
29* Master 291 Slave1 292 Slave2 293	Inverter compressor over current	Inverter compressor input current is over 30A	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. ODU Comp PCB assembly damage

■ Error Diagnosis and Countermeasure Flow Chart

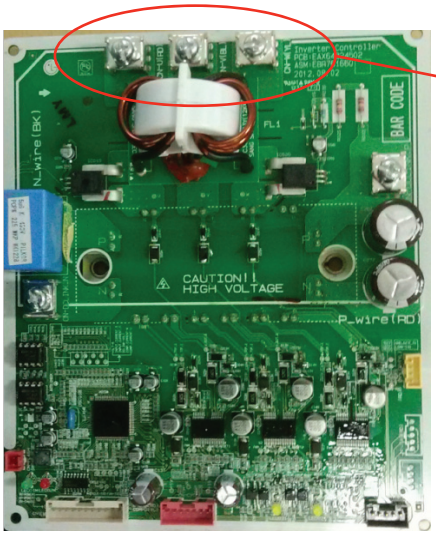


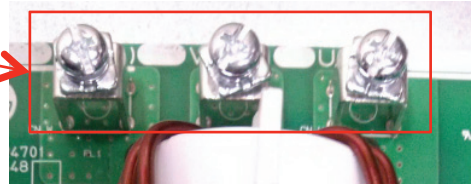
*** Measuring resistance between each terminal of compressor**

*** Measuring input voltage**



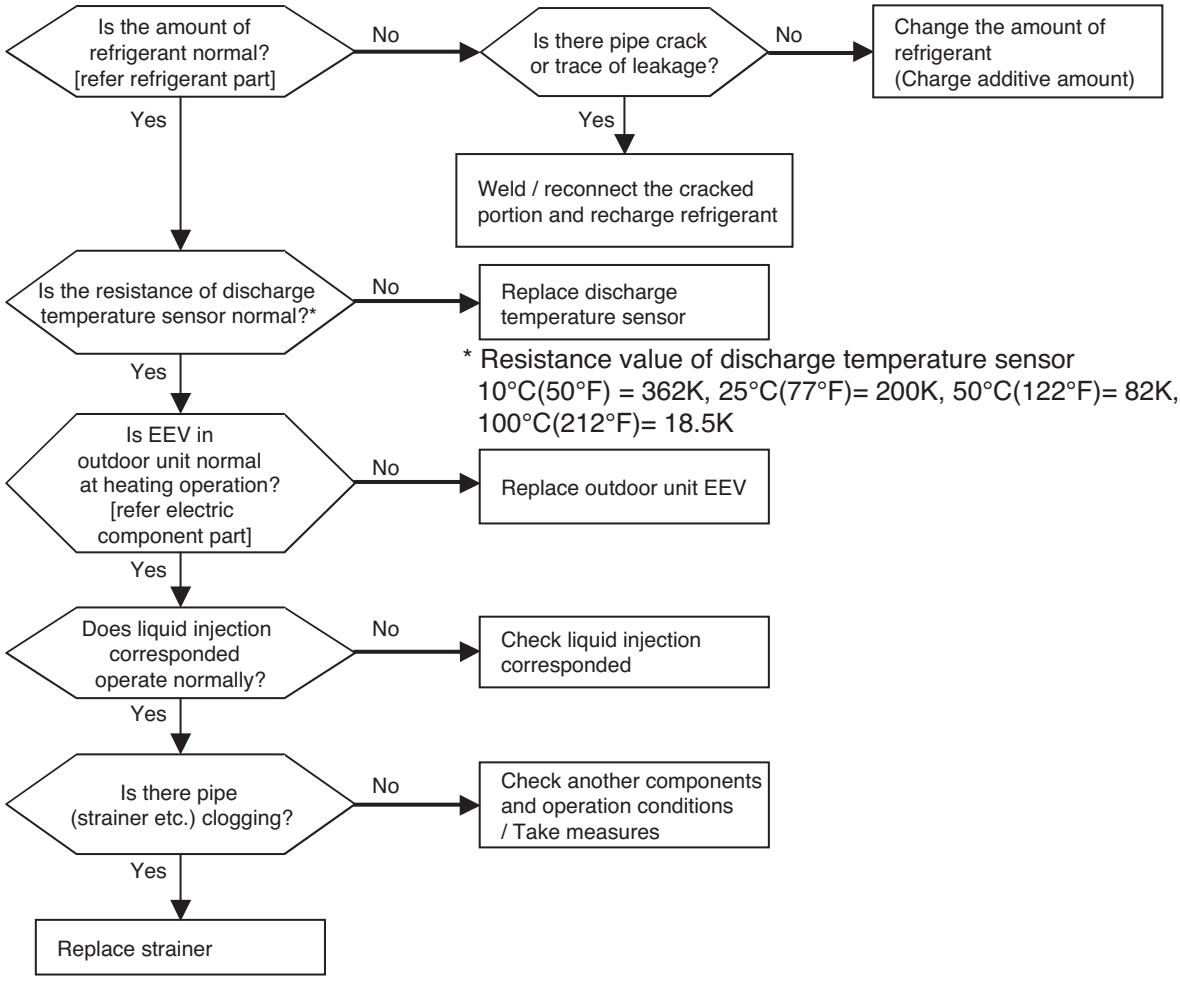
*** Compressor wire connection**





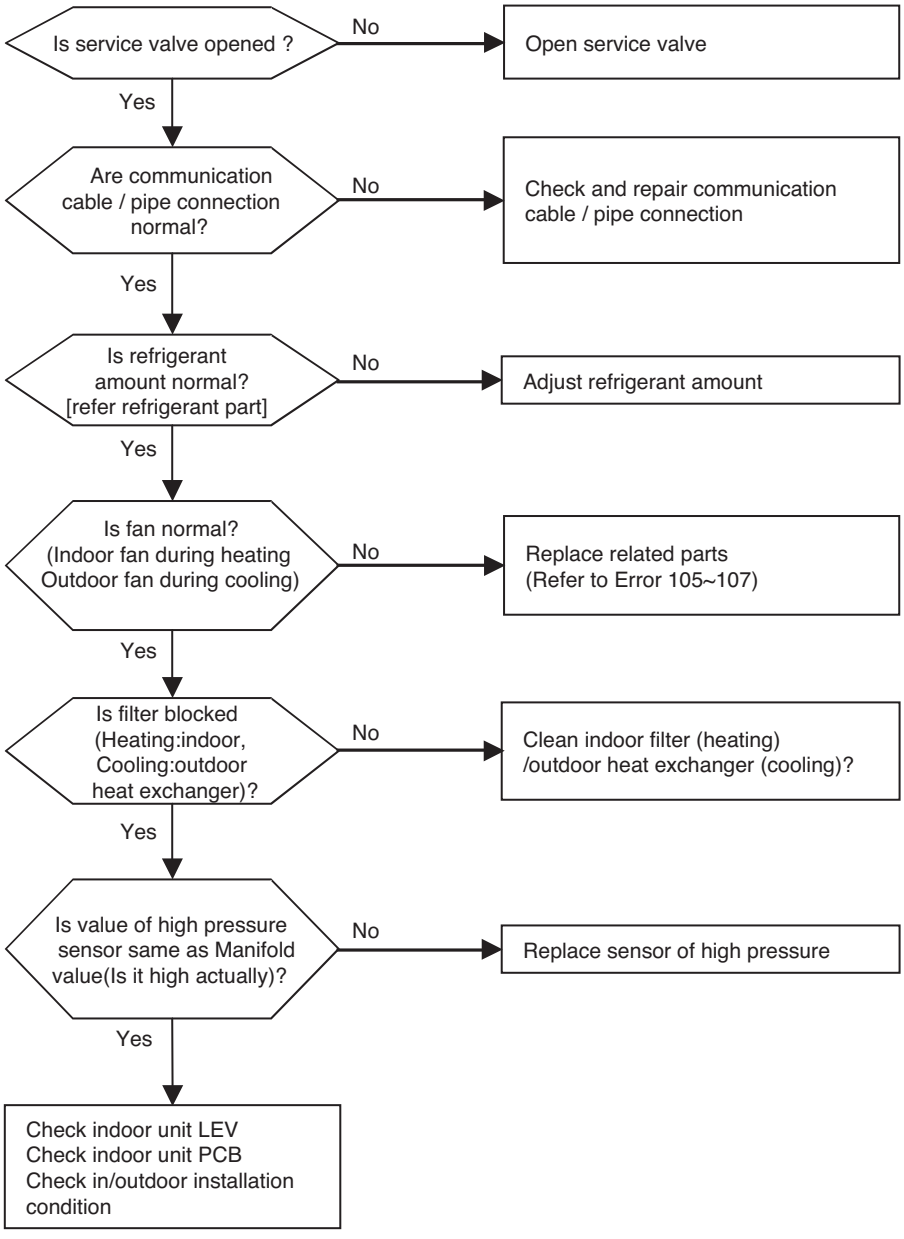
Error No.	Error Type	Error Point	Main Reasons
32* Master 321 Slave1 322 Slave2 323	Over-increase discharge temperature of inverter compressor 1 at main outdoor unit	Compressor is off because of over-increase discharge temperature of inverter compressor 1	1. Temperature sensor defect of inverter compressor 1 discharge pipe 2. Refrigerant shortage / leak 3. EEV defect 4. Liquid injection valve defect

■ Error diagnosis and countermeasure flow chart



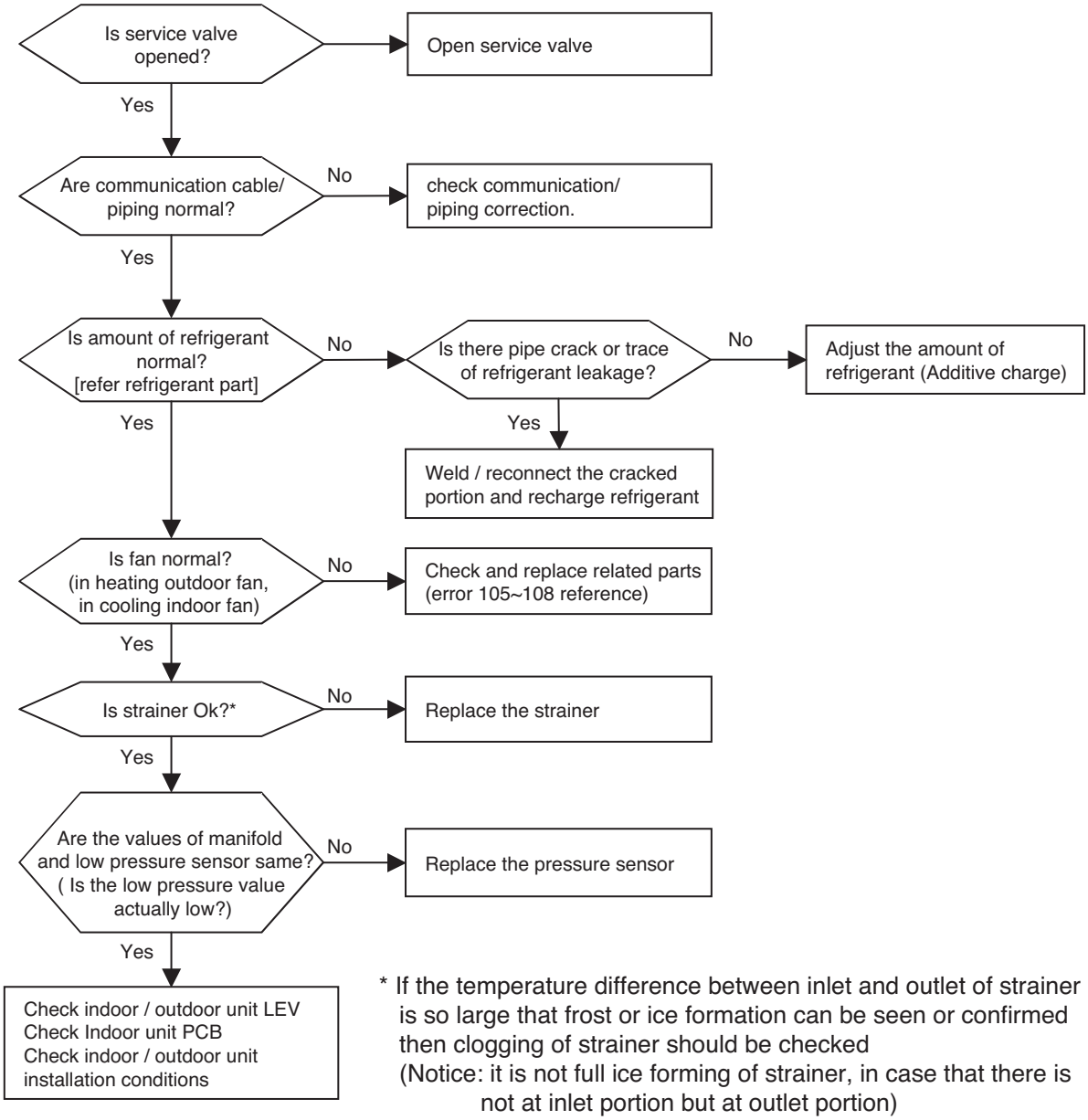
Error No.	Error Type	Error Point	Main Reasons
34* Master 341 Slave1 342 Slave2 343	Over-increase of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to over-increase of high pressure by high pressure sensor	1. Defect of high pressure sensor 2. Defect of 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
35* Master 351 Slave1 352 Slave2 353	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

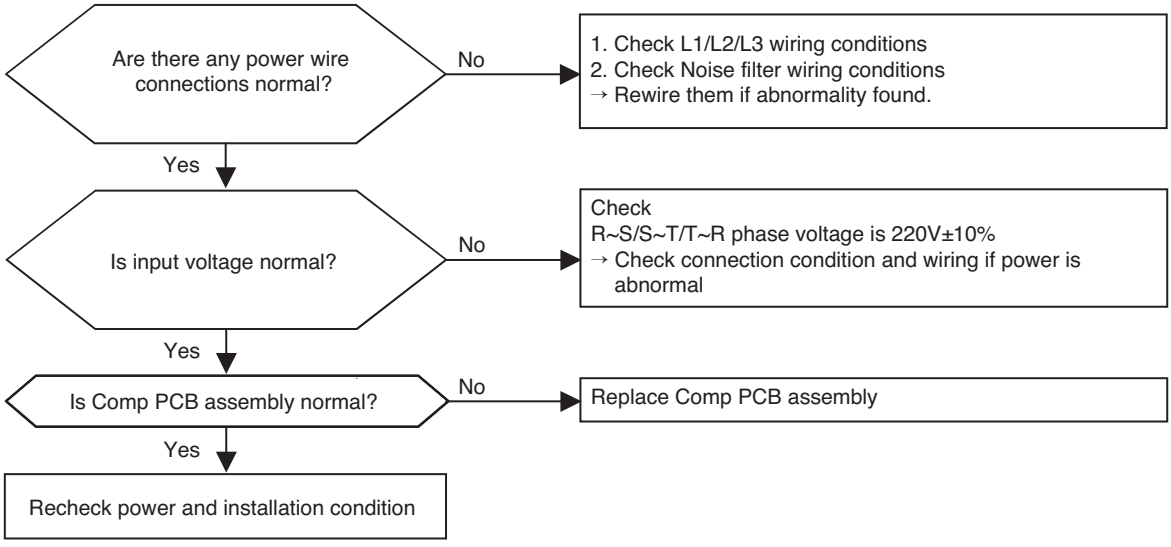
■ Error diagnosis and countermeasure flow chart



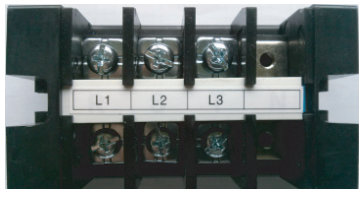
* If the temperature difference between inlet and outlet of strainer is so large that frost or ice formation can be seen or confirmed then clogging of strainer should be checked
(Notice: it is not full ice forming of strainer, in case that there is not at inlet portion but at outlet portion)

Error No.	Error Type	Error Point	Main Reasons
40* Master 401 Slave1 402 Slave2 403	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 (R-T) 2. ODU Comp PCB damage (CT sensing part)

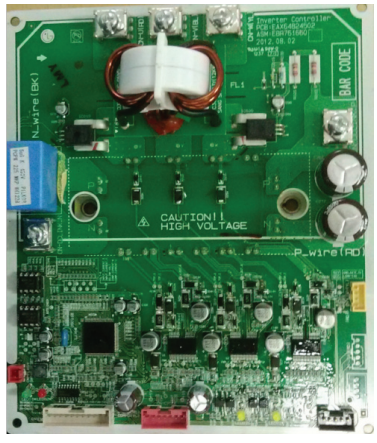
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring input voltage

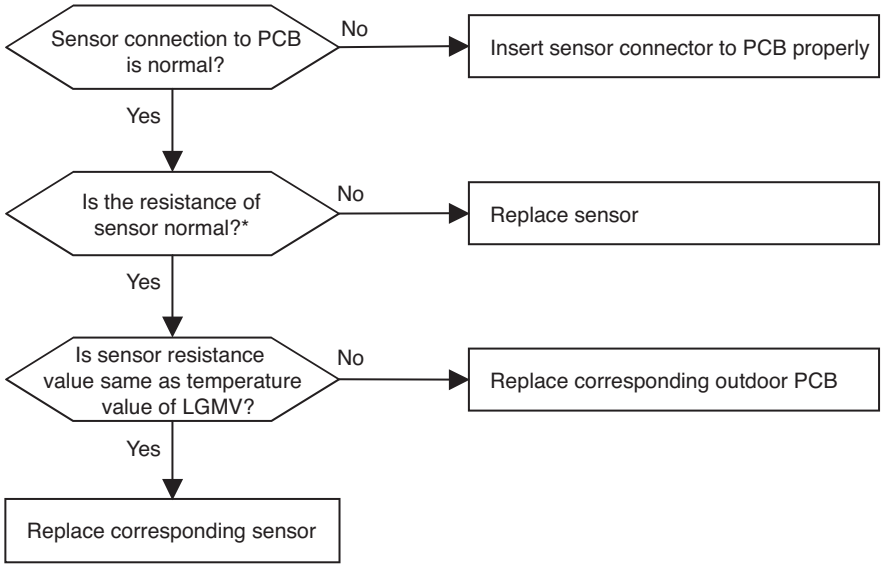


* Comp PCB assembly



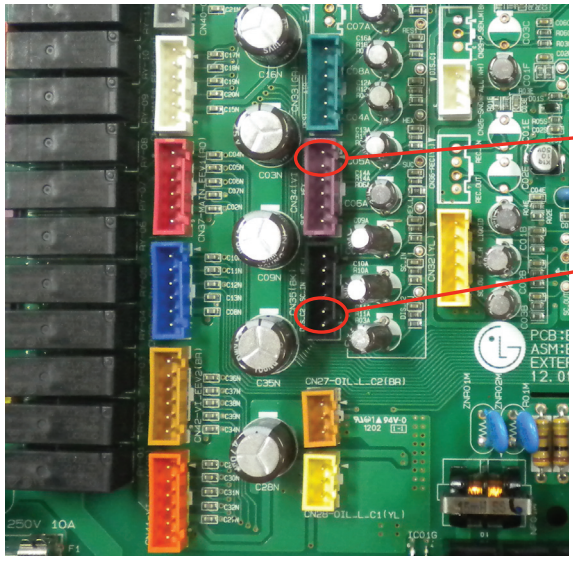
Error No.	Error Type	Error Point	Main Reasons
41* (Inverter1) Master 411 Slave1 412 Slave2 413	Compressor1 discharge pipe temperature sensor error	Sensor measurement value is abnormal (Open/Short)	1. Defective connection of the compressor discharge pipe temperature sensor 2. Defective discharge pipe compressor sensor of the compressor1 (open/short) 3. Defective outdoor PCB

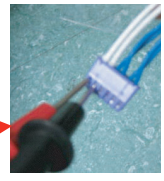
■ Error diagnosis and countermeasure flow chart

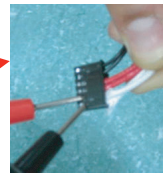


* Error is generated if the resistance is more than 5M(open) and less than 2k (short)

Note: Standard values of resistance of sensors at different temperatures (5% variation)
10°C(50°F) = 362K : 25°C(77°F) = 200K : 50°C(122°F) = 82K : 100°C(212°F) = 18.5K



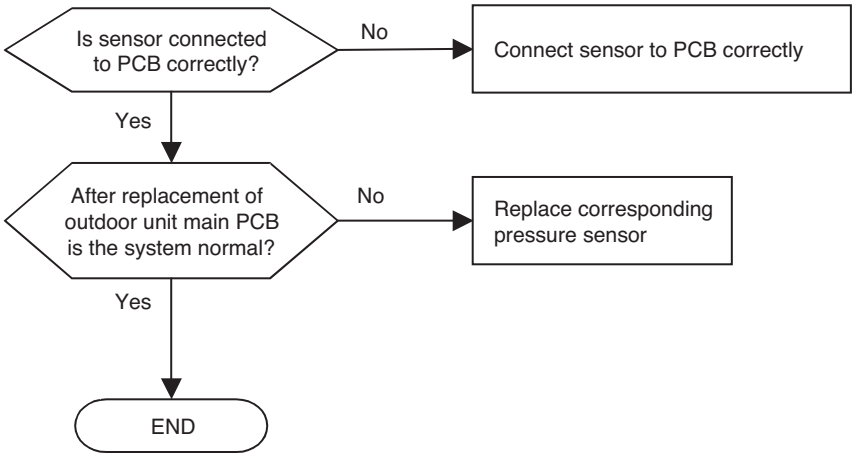




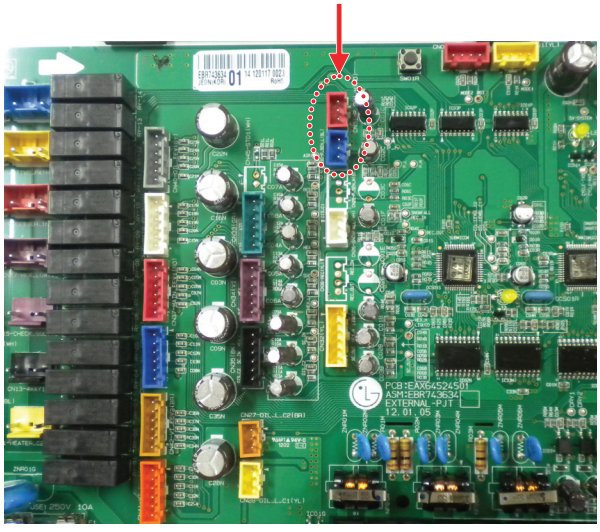
Check the resistance inverter compressor discharge temperature sensor

Error No.	Error Type	Error Point	Main Reasons
42* Master 421 Slave1 422 Slave2 423	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
43* Master 431 Slave1 432 Slave2 433	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

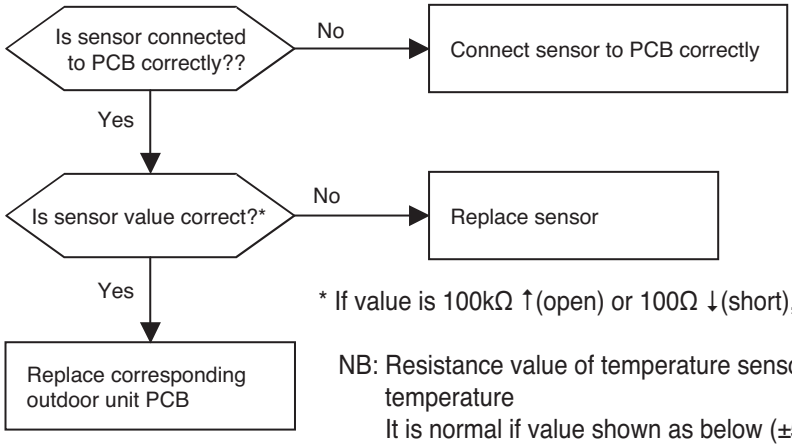


Pressure sensor connector



Error No.	Error Type	Error Point	Main Reasons
44* Master 441 Slave1 442 Slave2 443	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
46* Master 461 Slave1 462 Slave2 463	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
49* Master 491 Slave1 492 Slave2 493	Outdoor Unit IPM Temperature Sensor Fault	Outdoor Unit IPM Temperature Sensor Open or 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

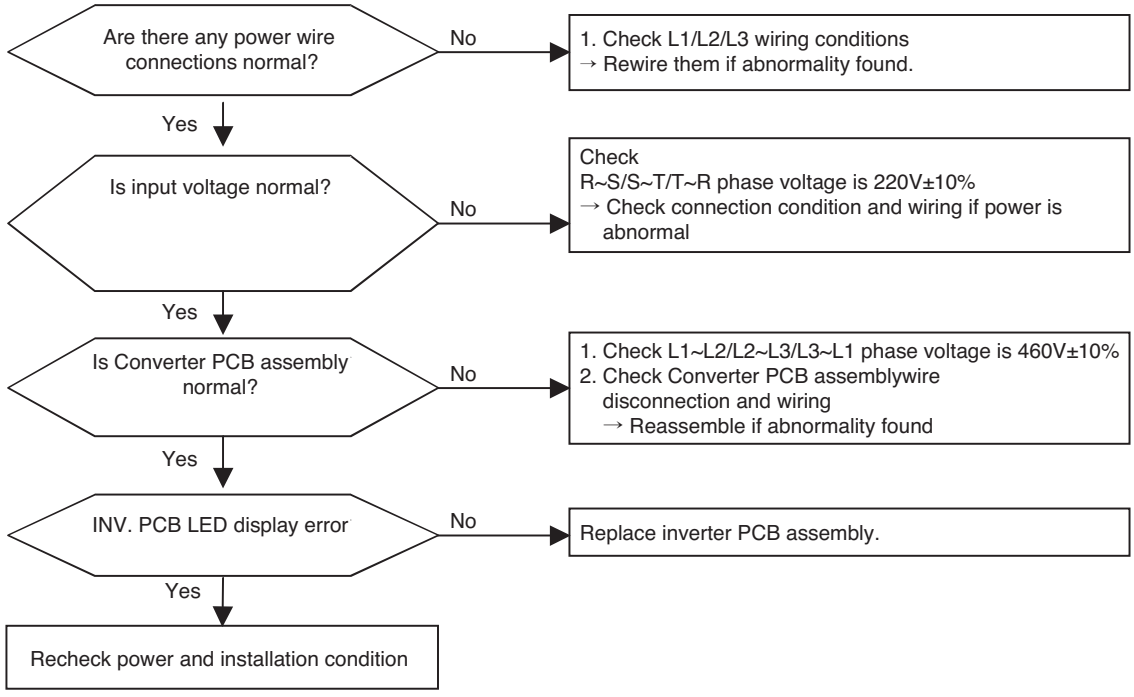


* If value is 100kΩ ↑(open) or 100Ω ↓(short), error occurs

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(50°F) = 20.7kΩ : 25°C(77°) = 10kΩ : 50°C(122°F) = 3.4kΩ
Sensor of piping temperature: 10°C(50°F) = 10kΩ : 25°C(77°F) = 5Ωk : 50°C(122°F) = 1.8kΩ

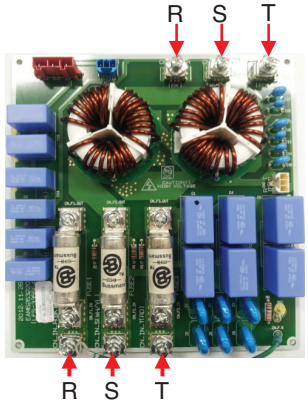
Error No.	Error Type	Error Point	Main Reasons
50* Master 501 Slave1 502 Slave2 503	ODU 3phase power omission error	Omitting one or more of R,S,T input power	1. Input Voltage abnormal (R,S,T) 2. Check power Line connection condition 3. Converter PCB damage 4. Converter PCB input current sensor fault

■ Error Diagnosis and Countermeasure Flow Chart

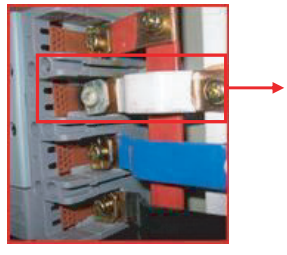


* Measuring input voltage

* Noise filter wiring



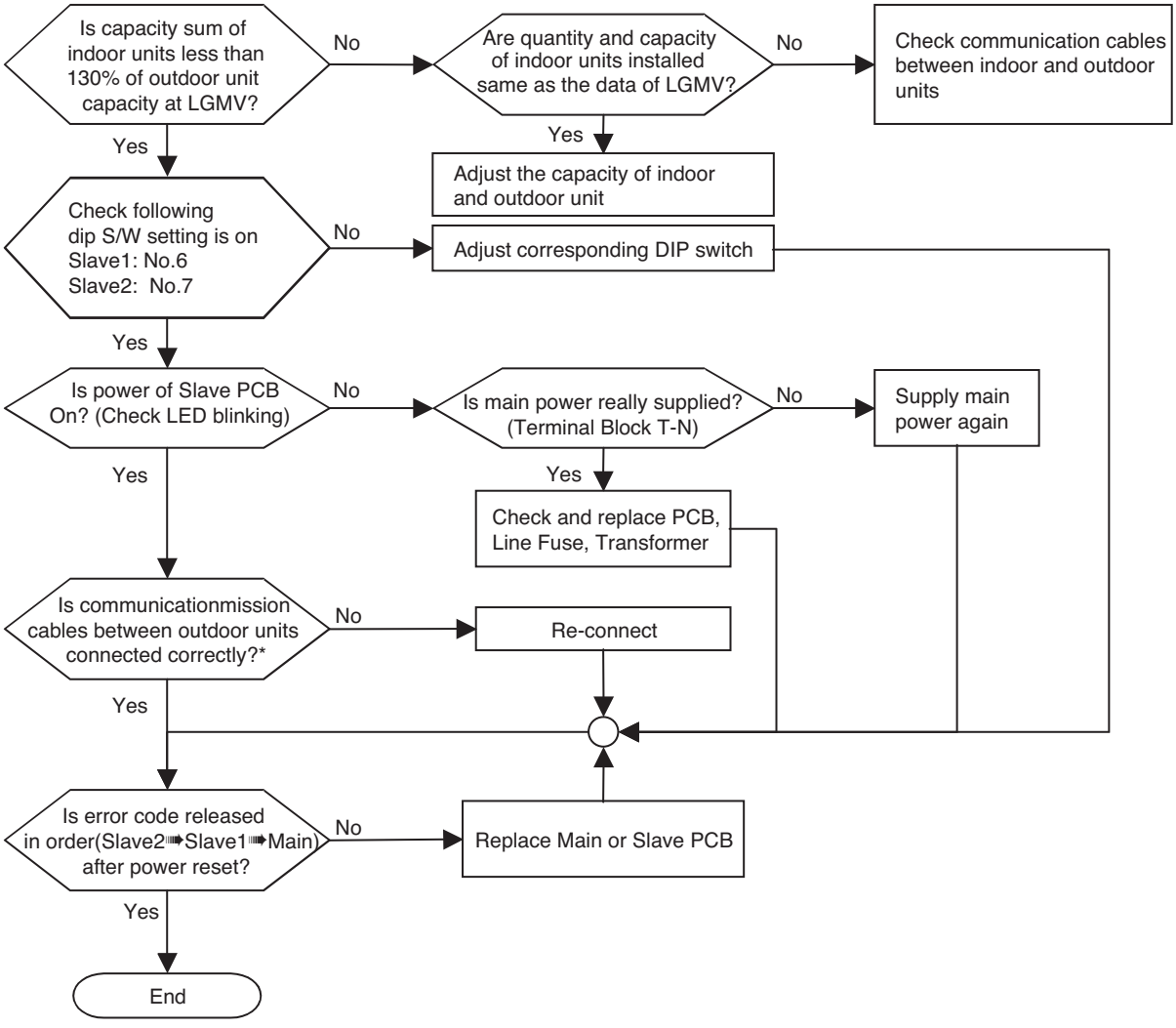
* Field Fault Case



* R-Phase Terminal Changed Color.

Error No.	Error Type	Error Point	Main Reasons
51* Master 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 communication cable/piping 3. Control error of slave outdoor unit Dip switch 4. Power supply defect of slave unit PCB 5. Defect of outdoor unit PCB

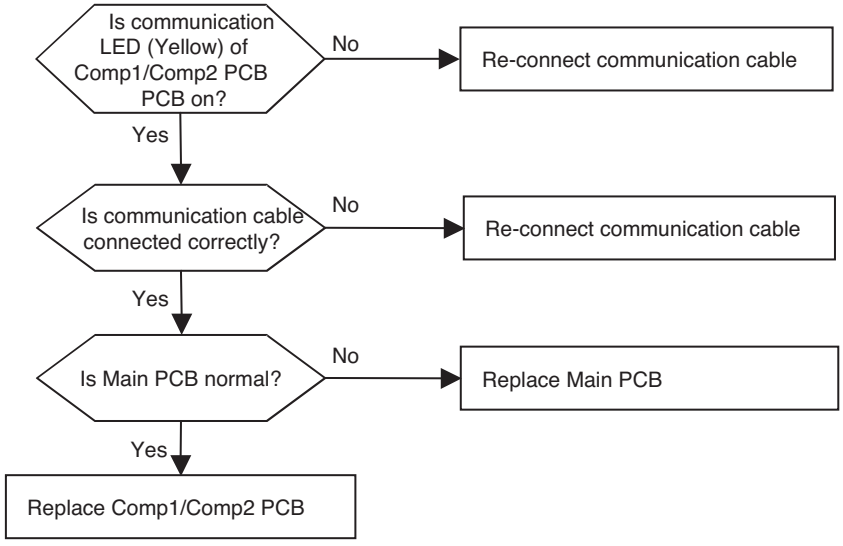
■ Error diagnosis and countermeasure flow chart



* In order to check communication cables between outdoor units,
check in order as below : PCB connectors ➠ terminal block ➠ communication cables

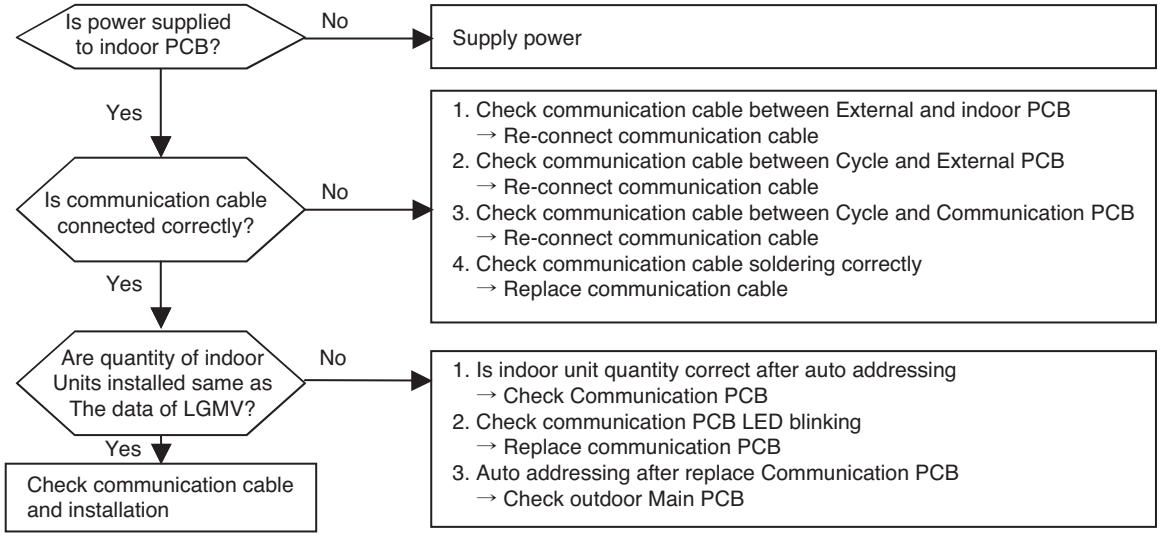
Error No.	Error Type	Error Point	Main Reasons
52* Master 521 Slave1 522 Slave2 523	Communication error between	Main PCB of Master unit of Master unit can't receive signal from controller	1. Power cable or communication cable is not connected 2. Defect of outdoor Main PCB

■ Error diagnosis and countermeasure flow chart



Error No.	Error Type	Error Point	Main Reasons
53* Master 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

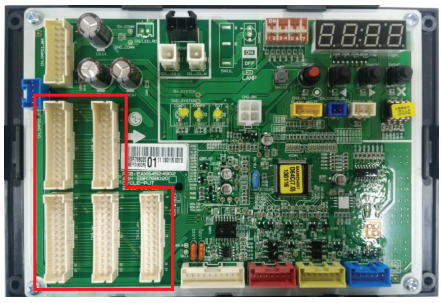


In case of CH53, almost happened with CH05, the indoor units not operated actually are normal so check with same method of CH05. and additionally check as shown as below and above flow chart

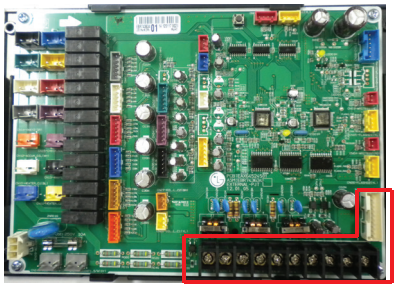
- Although the quantity of indoor units installed is same as LGMV data there may be a few indoor units with which the number of communication is not increased with LGMV
- Although the quantity of indoor units installed is not same as LGMV data, and if communication of the indoor unit displayed at LGMV 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



Communication Part in External PCB



❉ Remark : IDU A/IDU B

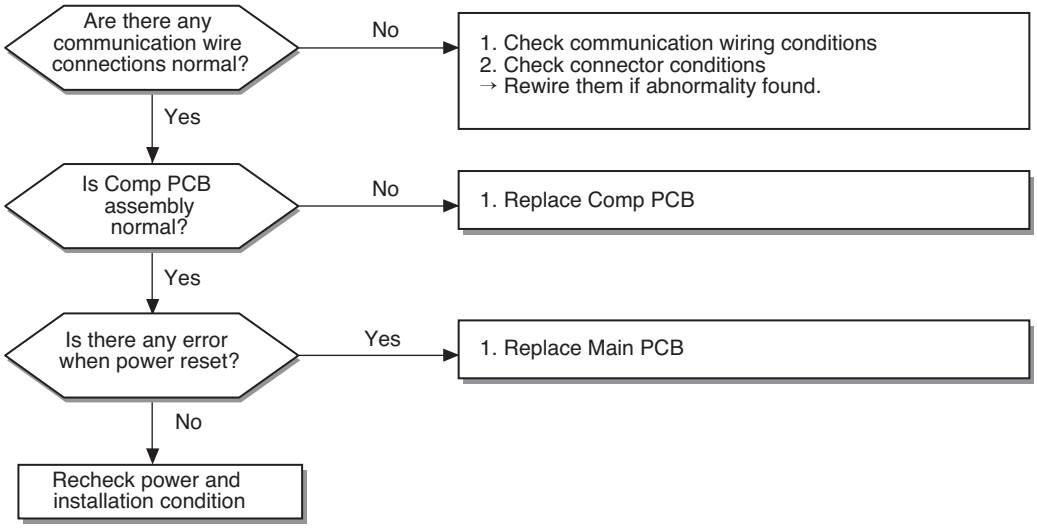
Wiring Fault Case

Indoor Unit
Communication PCB

❉ 1 time/10 sec Turn on/off

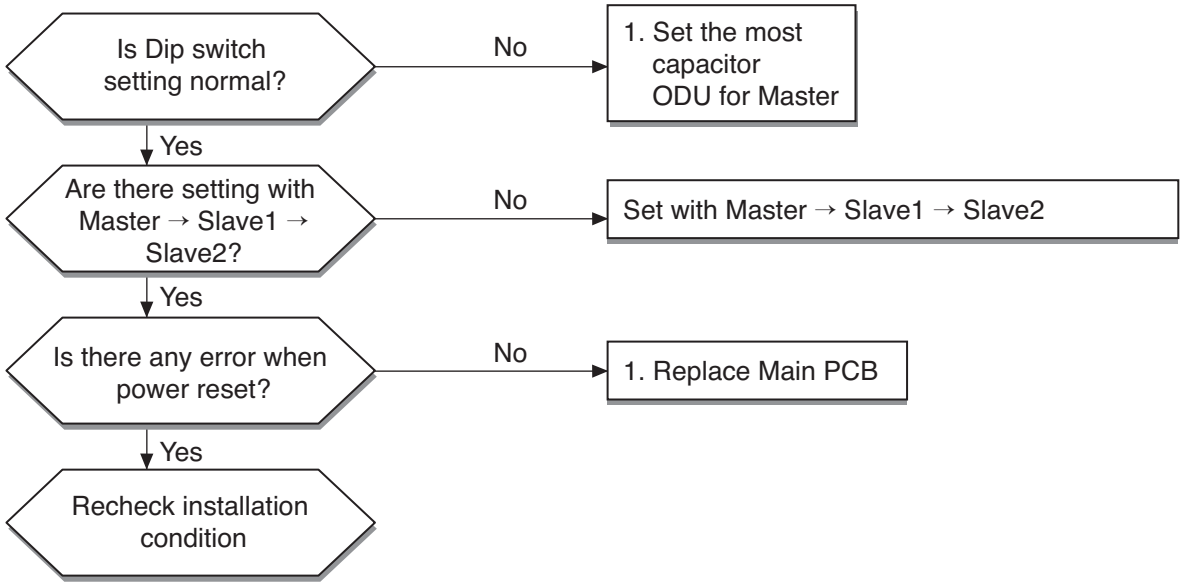
Error No.	Error Type	Error Point	Main Reasons
57* Master 571 Slave1 572 Slave2 573	Communication error : Main PCB --> Comp PCB	Failing to receive inverter signal at main PCB of Outdoor Unit	1. Bad Connection Between Comp PCB and Comp PCB 2. Communication Wire Noise Effect 3. ODU Main PCB Damage 4. ODU Main PCB Damage

■ Error diagnosis and countermeasure flow chart

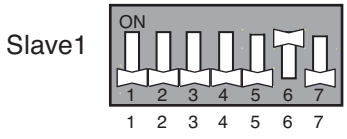


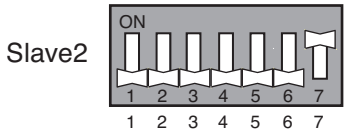
Error No.	Error Type	Error Point	Main Reasons
59* Master 591 Slave1 592 Slave2 593	Series Installation Error	Series Installation of Slave Outdoor Unit Larger Than Master Capacity	1. Dip Switch Setting Error

■ Error Diagnosis and Countermeasure Flow Chart



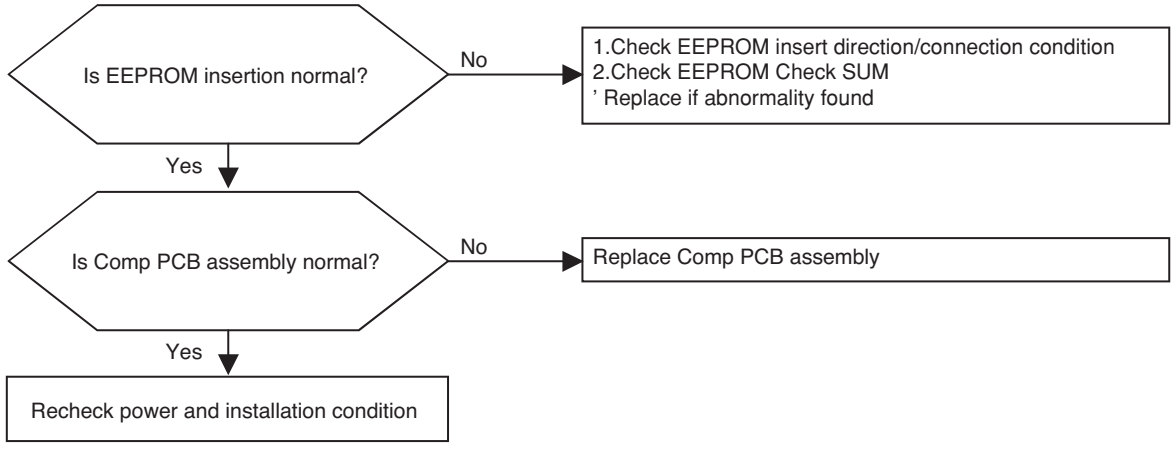
* Dip Switch Setting



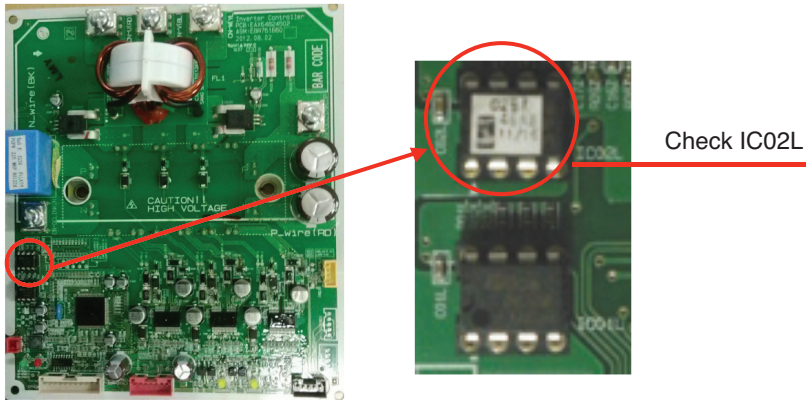


Error No.	Error Type	Error Point	Main Reasons
60* Master 601 Slave1 602 Slave2 603	Comp PCB EEP-ROM error	EEPROM Access error and Check SUM error	1. EEPROM contact defect/wrong insertion 2. Different EEPROM Version 3. ODU Comp PCB assembly damage

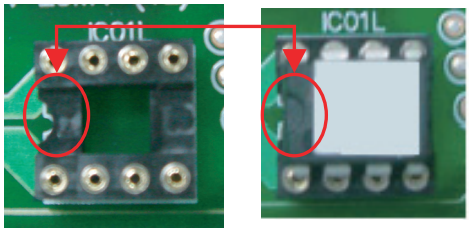
■ Error Diagnosis and Countermeasure Flow Chart



* Inverter EEPROM inserting point



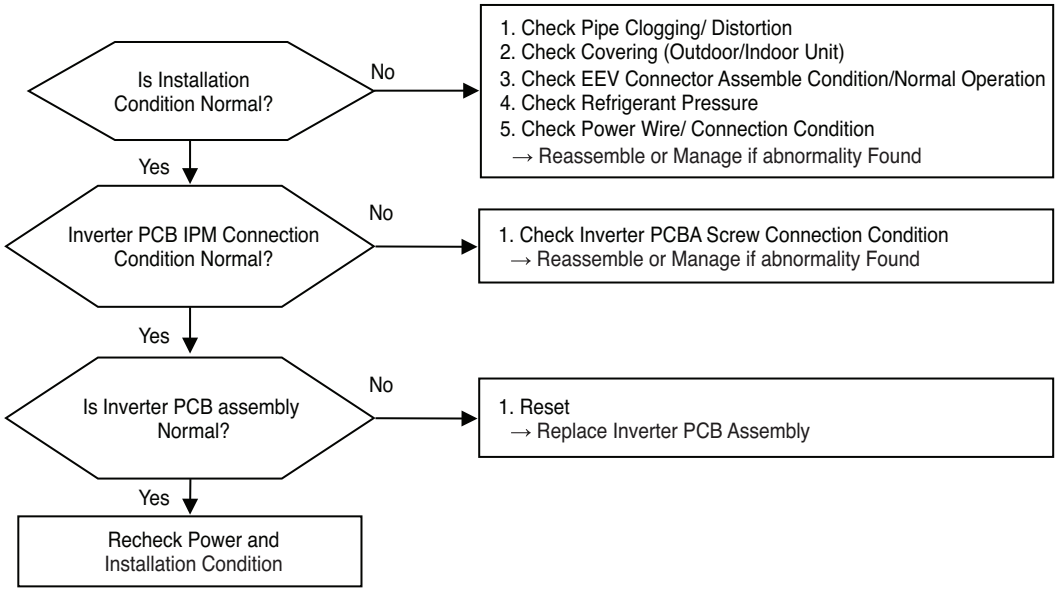
* Right inserting direction of inverter EEPROM



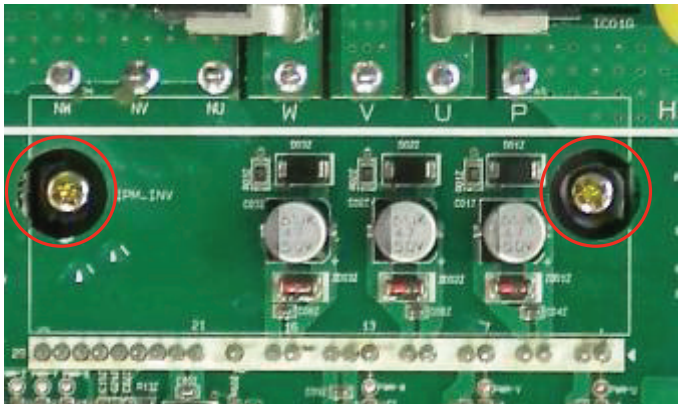
※ Note : Replace after power off

Error No.	Error Type	Error Point	Main Reasons
62* Master 621 Slave1 622 Slave2 623	Inverter PCB Heatsink Temperature High	Heatsink Temperature is Over 90°C(194°F)	1. Inverter PCBA IPM Connection Condition Abnormal 2. Outdoor Unit Inverter PCB Assembly Defect 3. Overload Operation (Pipe Clogging/ Covering/EEV Defect/Ref. Overcharge)

■ Error diagnosis and countermeasure flow chart



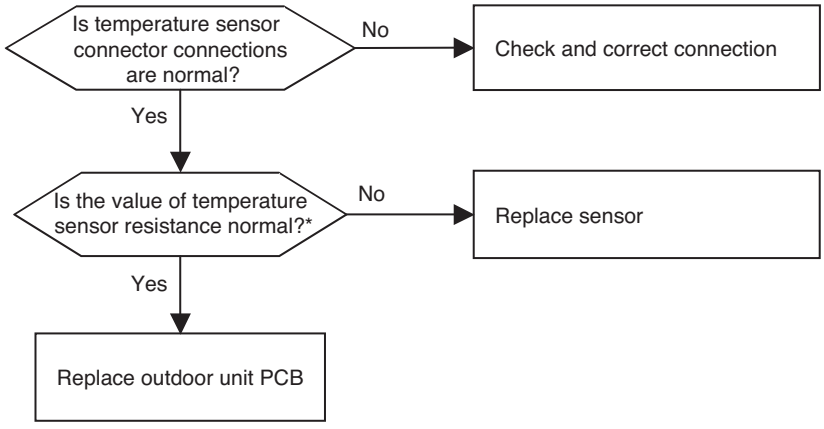
■ Check Inverter PCB Screw Connection Condition



Check Screw Connection Condition

Error No.	Error Type	Error Point	Main Reasons
65* Master 651 Slave1 652 Slave2 653	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

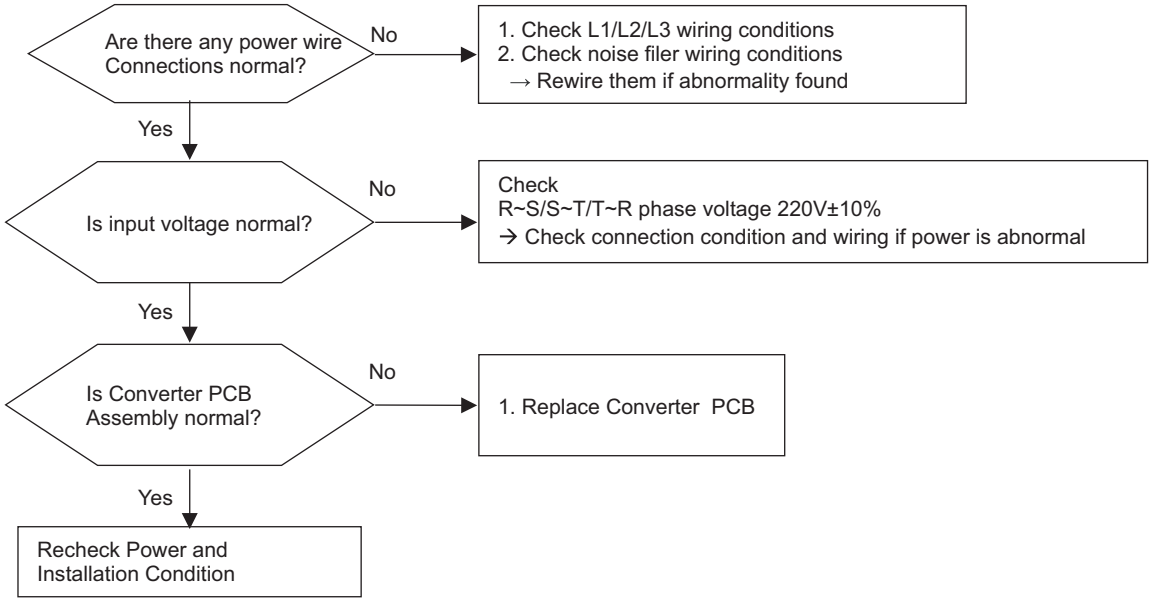


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

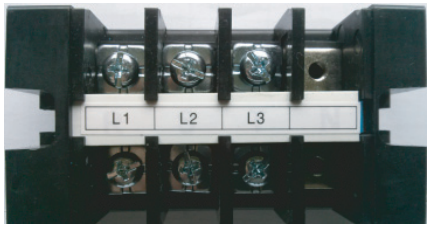
Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10 °C(50 °F) = 20.7kΩ : 25 °C(77 °F) = 10kΩ : 50 °C(122 °F) = 3.4kΩ
Pipe temperature sensor: 10 °C(50 °F) = 10kΩ : 25 °C(77 °F) = 5kΩ : 50 °C(122 °F) = 1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
71* Master 711 Slave1 712 Slave2 713	Converter CT Sensor Error	Micom input voltage isn't within 2.5V±0.3V at initial state of power supply	1. Input Voltage is abnormal (R-T) 2. ODU Converter PCB damage (CT sensing part)

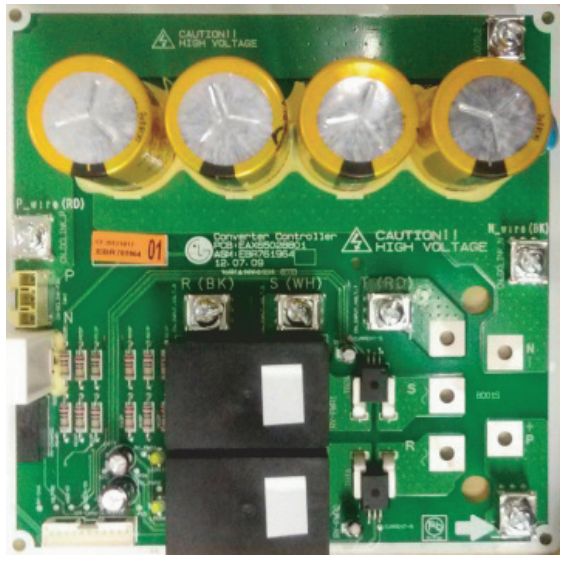
■ Error diagnosis and countermeasure flow chart



*** Measuring input voltage**

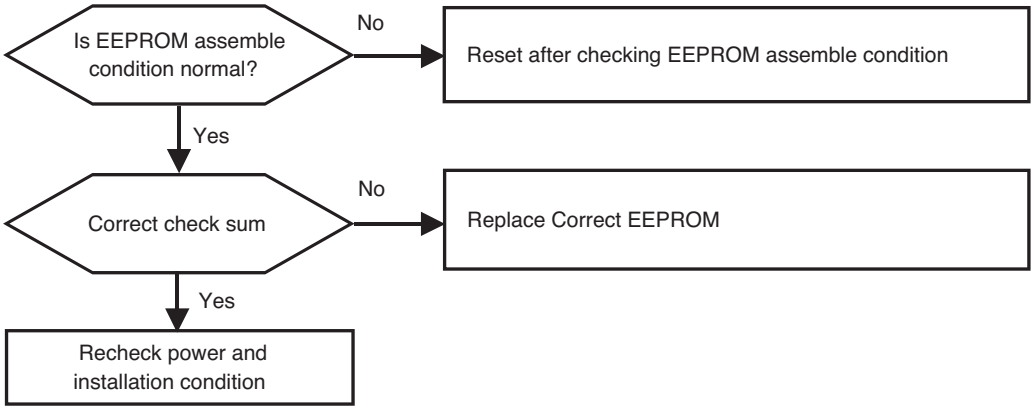


*** Converter PCB assembly**

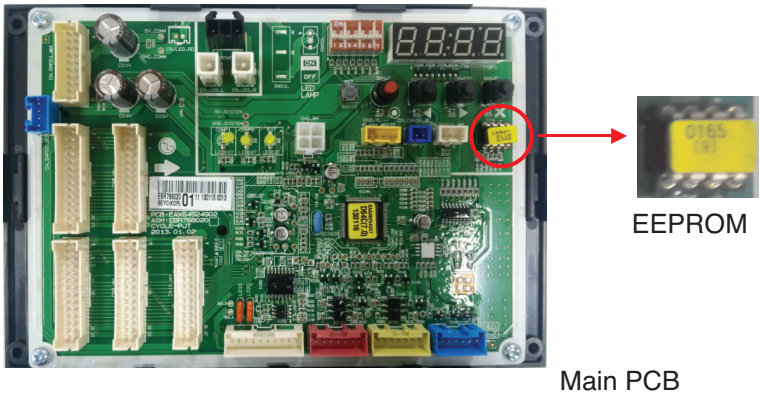


Error No.	Error Type	Error Point	Main Reasons
86* Master 861 Slave1 862 Slave2 863	Main PCB EEPROM	EEPROM Access Error	1. No EEPROM 2. EEPROM wrong insertion

■ Error Diagnosis and Countermeasure Flow Chart



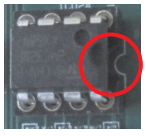
EEPROM Insertion



EEPROM

Main PCB

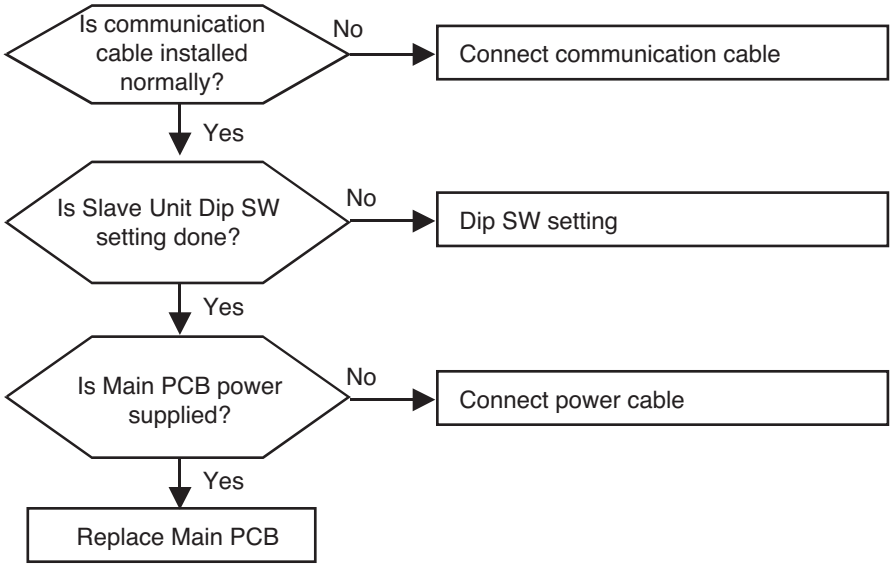
* Note : Replace after power off



Same direction both socket hole and EEPROM hole

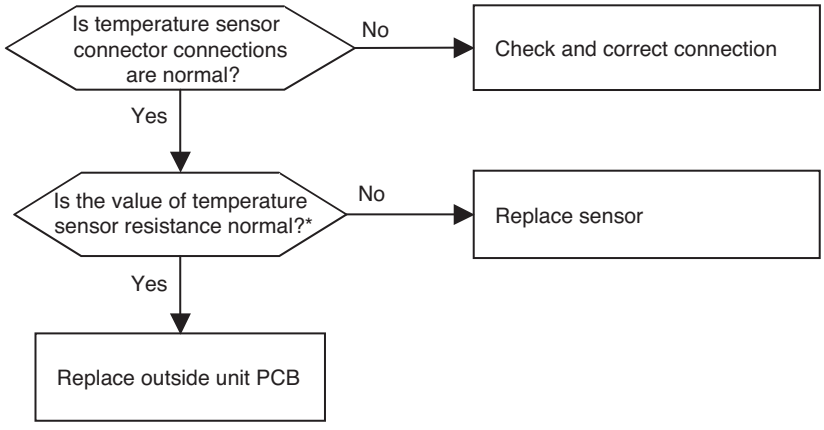
Error No.	Error Type	Error Point	Main Reasons
104* Master 1041 Slave1 1042 Slave2 1043	Communication Error Between Outdoors	Master displays ODU number which is not communicated. Slave displays own error number	1.Loose connection of power cable/ communication cable¸(Open/Short) 2.Defect of each outdoor unit PCB

■ Error Diagnosis and Countermeasure Flow Chart



Error No.	Error Type	Error Point	Main Reasons
113* Master 1131 Slave1 1132 Slave2 1133	Outside 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 Outside unit PCB
115* Master 1151 Slave1 1152 Slave2 1153	Outside 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

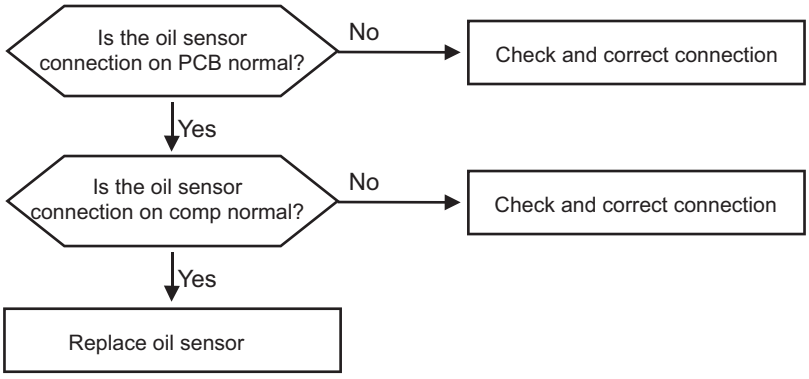


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to Outside 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

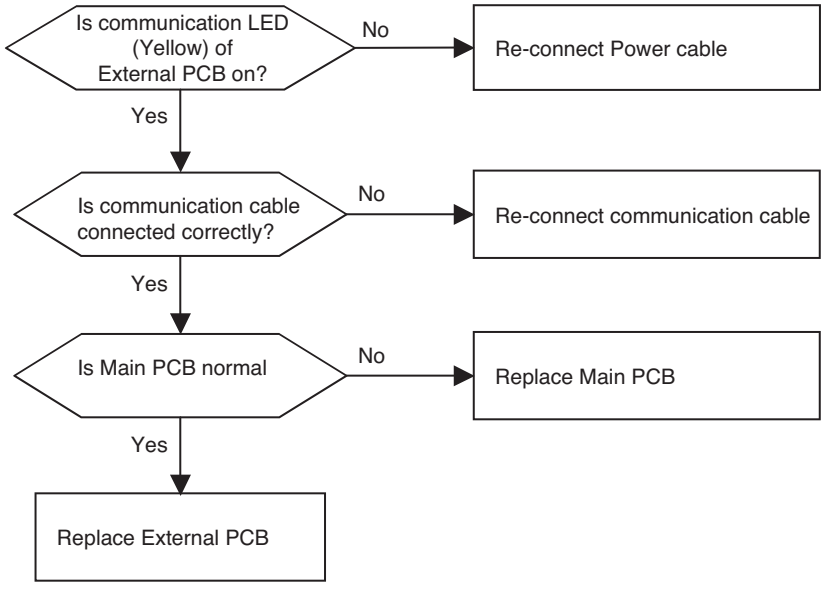
Error No.	Error Type	Error Point	Main Reasons
116 Master (1161) Slave1 (1162) Slave2 (1163)	Outside unit Oil level Sensor Error	Lack of comp. oil Abnormal sensor resistance value (Open/Short)	1. Lack of Comp. Oil 2. Defective oil sensor (Open/Short)

■ Error diagnosis and countermeasure flow chart

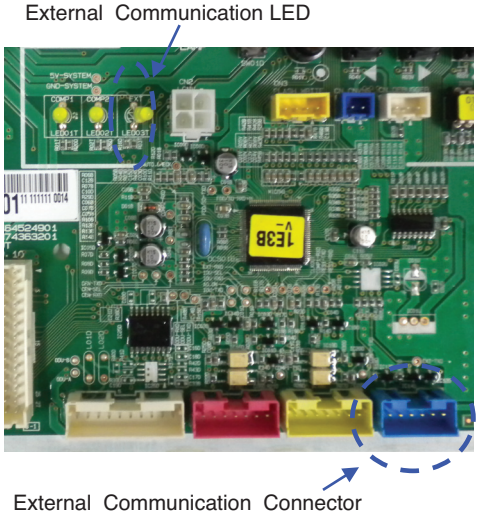


Error No.	Error Type	Error Point	Main Reasons
145* Master 1451 Slave1 1452 Slave2 1453	Communication Error between (Main PCB → External PCB)	Cycle controller of Master unit of Master unit can't receive signal from External controller	1. Power cable or communication cable is not connected 2. Defect of outdoor Cycle/External PCB

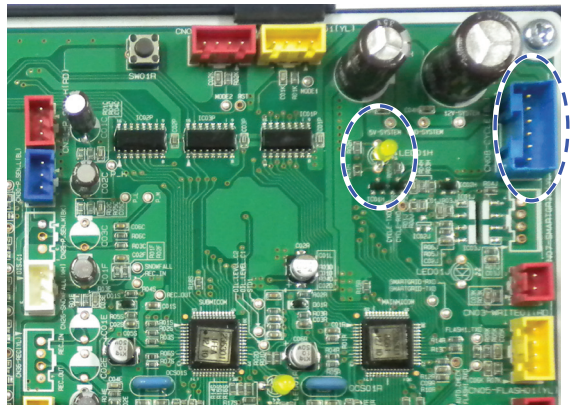
■ Error diagnosis and countermeasure flow chart



* The Method of checking Main PCB and External PCB (If normal, communication LED blinks)



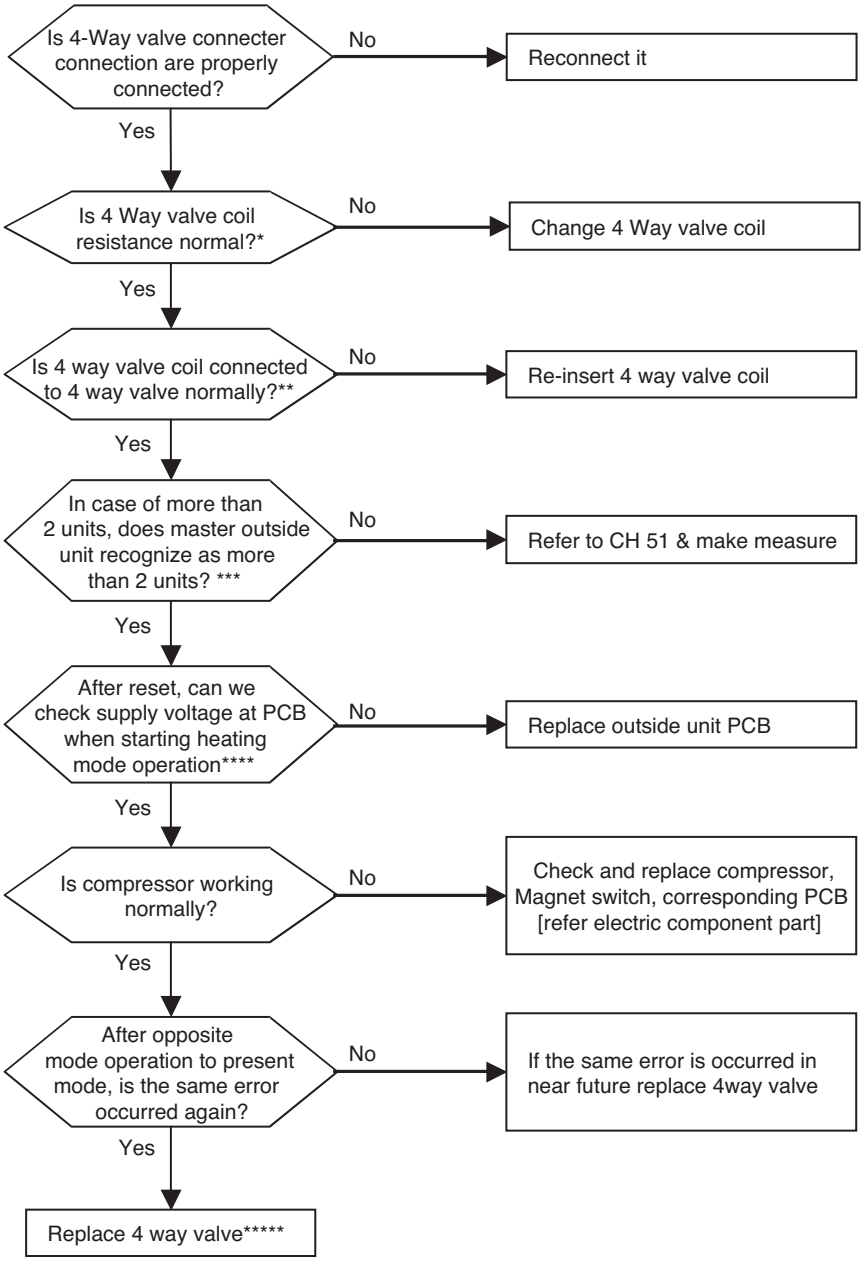
Communication Connector & LED in Main PCB



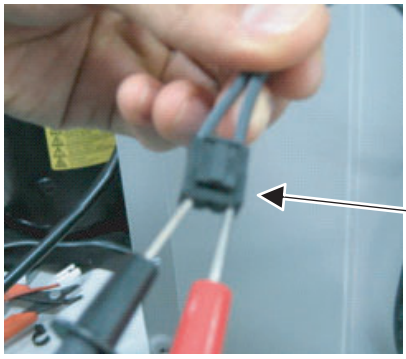
Communication Connector & LED in External PCB

Error No.	Error Type	Error Point	Main Reasons
151* Master 1511	Function error of outdoor 4way (reversing valve)	Function error of 4way (reversing valve) in Main or Slave Outside 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

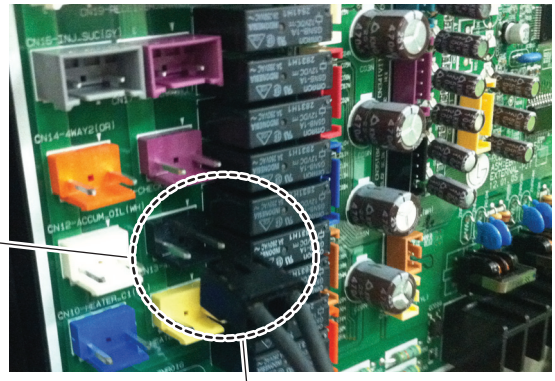
■ Error diagnosis and countermeasure flow chart



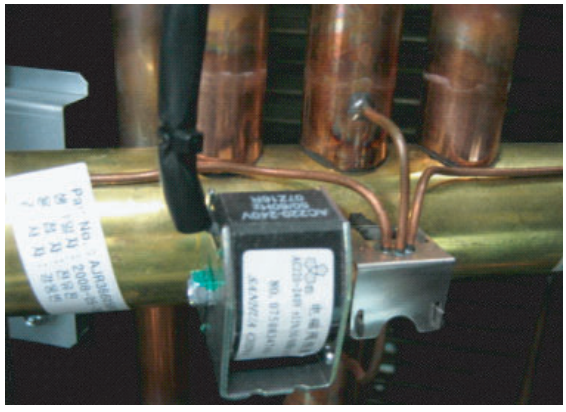
* Measure the resistance of 4way valve



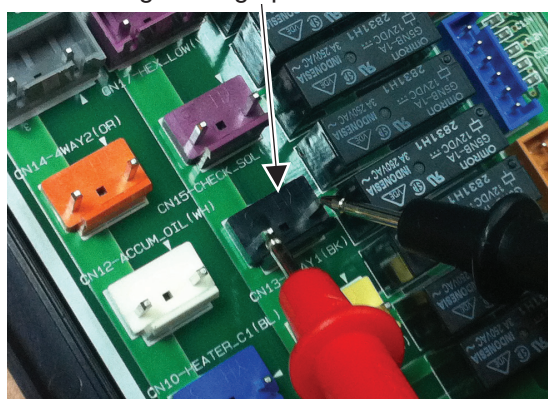
Location of 4way valve connector on Main PCB(marked as 4way,CN09)



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



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



*** When power is supplied in order as follow
(Slave2 → Slave1 → Mater)
ODU information is displayed one after the other at main PCB 7-segment

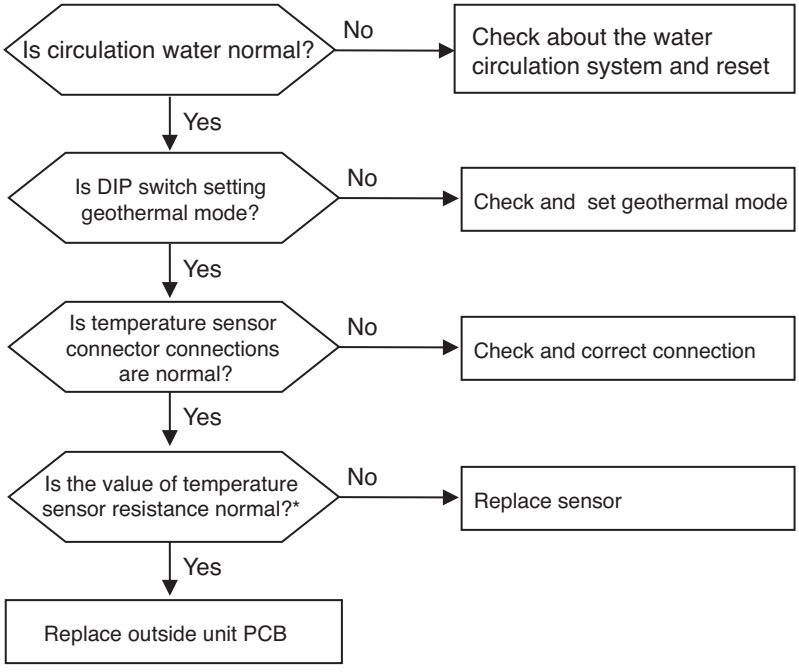
1. Model ID
   → 8HP : 8, 10HP : 10, 12HP : 12, 14HP : 14, 16HP : 16, 18HP : 18, 20HP : 20
2. Total Capacity
   → Displayed with HP
3. ODU Type
   → Cooling only :1
   → Heat pump :2
4. Power type
   → 380V : 38
5. Model type
   → LAS4:1

***** Checking method for Outside unit of 3unit system
(Master + Slave1 + Slave2)

① Close all the SVC valves of high / low pressure
② Operate system
③ Check the difference of high and low pressure with LGMV for each unit (Master, Slave1, Slave2)
④ If there is a unit in which the difference is not increased then the 4way valve of that unit is defective

Error No.	Error Type	Error Point	Main Reasons
180 Master (1801) Slave1 (1802) Slave2 (1803)	Plate type heat exchanger freeze prevention	Plate type heat exchanger freeze prevention	1. Lack of circulation water 2. Inlet water temperaure is low 3. Defective water temperature sensor (Open/Short)

■ Error diagnosis and countermeasure flow chart

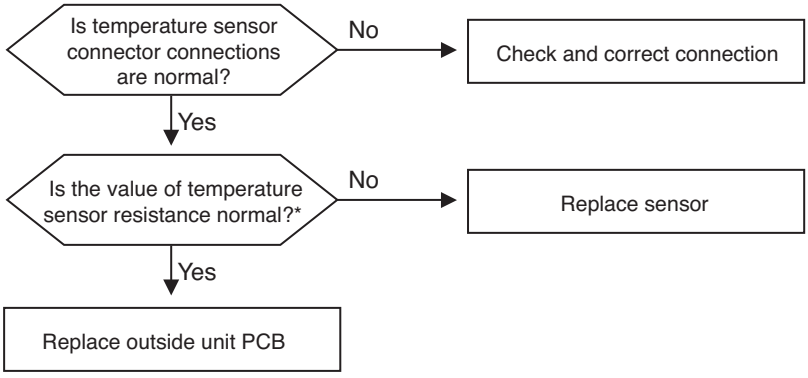


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to Outside unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10 °C(50 °F) = 20.7kΩ : 25 °C(77 °F) = 10kΩ : 50 °C(122 °F) = 3.4kΩ
Pipe temperature sensor: 10 °C(50 °F) = 10kΩ : 25 °C(77 °F) = 5kΩ : 50 °C(122 °F) = 1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
181 Master (1811) Slave1 (1812) Slave2 (1813)	Water 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

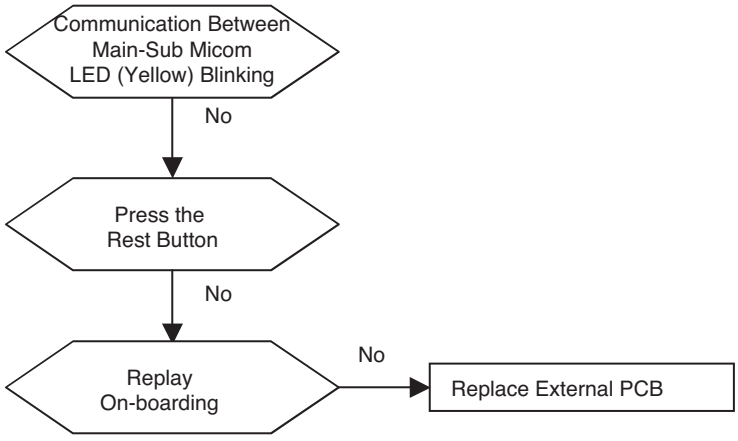


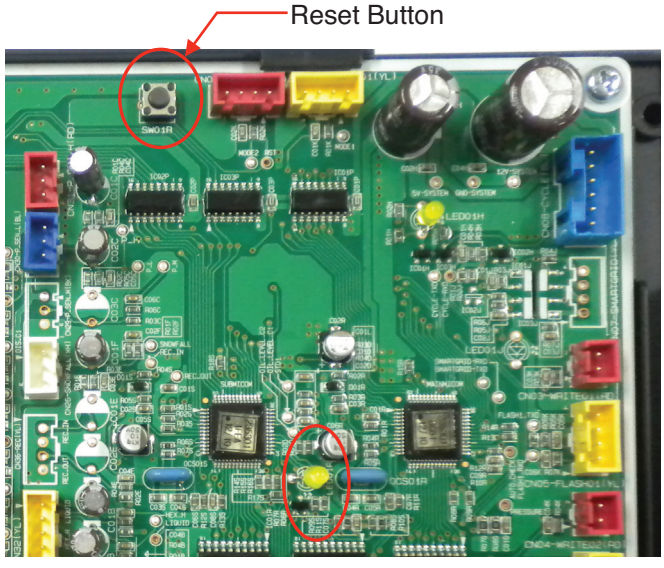
* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to Outside unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10 °C(50 °F) = 20.7kΩ : 25 °C(77 °F) = 10kΩ : 50 °C(122 °F) = 3.4kΩ
Pipe temperature sensor: 10 °C(50 °F) = 10kΩ : 25 °C(77 °F) = 5kΩ : 50 °C(122 °F) = 1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
182* Master 1821 Slave1 1822 Slave2 1823	Communication Error Between Main and Sub Micom of External PCB	Failure Receiving Signal Between Main and Sub Micom	1. Failure Receiving Signal Between Main and Sub Micom

■ Error diagnosis and countermeasure flow chart





Communication LED
Between Main and Sub Micom

Error No.	Error type	Error point	Main reasons
201C#h	HR unit liquid pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	• Defective temperature sensor connection • Defective temperature sensor (Open/Short) • Defective Outside unit PCB

Error No.	Error type	Error point	Main reasons
202C#h	HR unit Sub-cooling inlet pipe temperature sensor error	Abnormal value of sensor measurement(Open / Short)	• Defective temperature sensor connection • Defective temperature sensor (Open/Short) • Defective Outside unit PCB

Error No.	Error type	Error point	Main reasons
203C#h	HR unit Sub-cooling discharge pipe temperature sensor error	Abnormal value of sensor measurement(Open / Short)	• Defective temperature sensor connection • Defective temperature sensor (Open/Short) • Defective Outside unit PCB

■ Error diagnosis and countermeasure flow chart

1) Check connection condition of temperature sensor and lead cable

2) Is value of temperature sensor normal? If not replace sensor
   - Piping temperature sensor : 10°C(50°F) = 10kΩ : 25°C(77°F)= 5kΩ : 50°C(122°F)= 1.8kΩ

3) If connection of sensor and value is correct, replace Outside unit PCB

■ HR unit error display No.

HR Unit	HR #1	HR #2	HR #3	HR #4	HR #5	HR #6	HR #7	HR #8	HR #9	HR #10	HR #11	HR #12	HR #13	HR #14	HR #15	HR#16
Error display	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16

■ Example of HR unit error display.

#16 HR unit Sub-cooling inlet pipe temperature sensor error 200 ➔ C16 (Repeat)

C: HR unit

#: HR unit Nuber

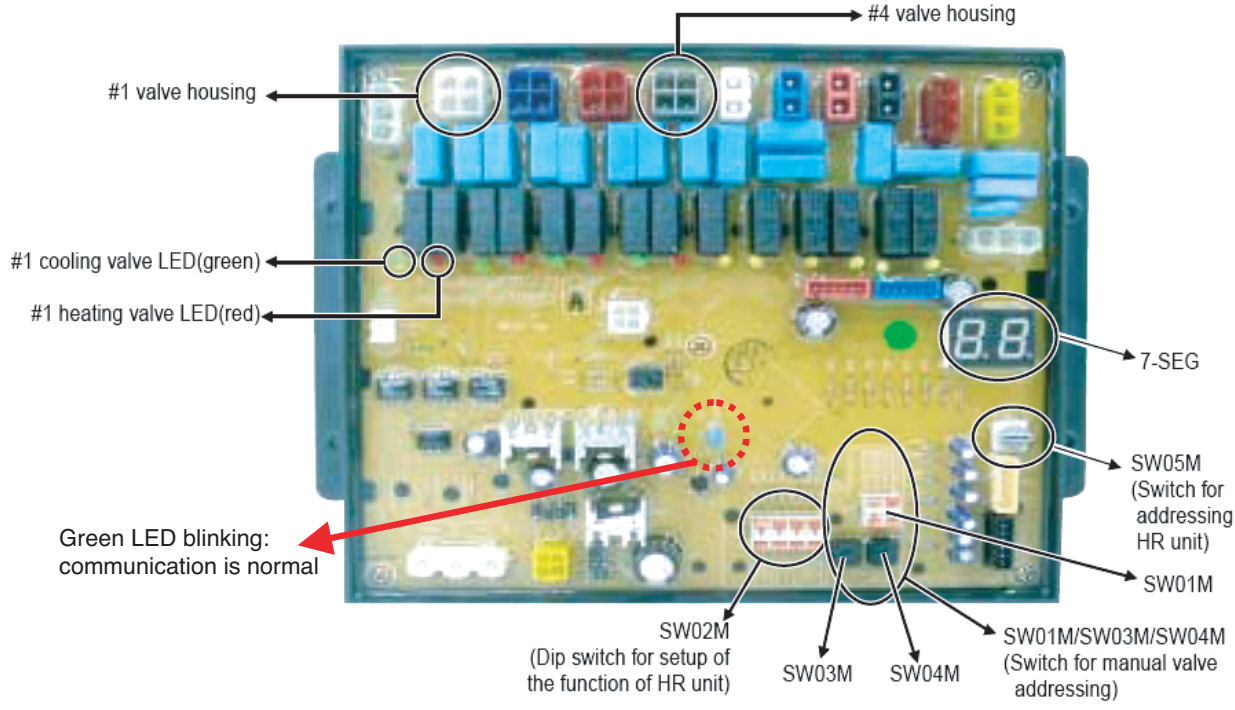
Error No.	Error type	Error point	Main reasons
204C#h	Transmission error between the HR unit and Outside unit	Transmission error between the HR unit and Outside unit	1. Defective connection in HR unit power supply and communication connection 2. Wrong setting of the HR unit rotary switch and dip switch 3. Defective HR unit PCB

■ Error diagnosis and countermeasure flow chart

1) Check connection between power cables and communication cables, check communication green LED blink of HR unit PCB
2) If communication green LED blink of HR unit PCB is normal, check setting of rotary switch of HR unit and dip switch(Refer to CH200),
   Reset power of outdoor and HR unit
   (If communication error of HR unit occurs, it can't be released until reset of outdoor power)
3) If communication green LED blink of HR unit PCB is abnormal(not blinking,just on), check communication condition of total indoor units(Refer to CH05)
   If communication green LED blink of HR unit PCB is abnormal(not blinking, just on) even if communication condition is normal, replace HR unit PCB

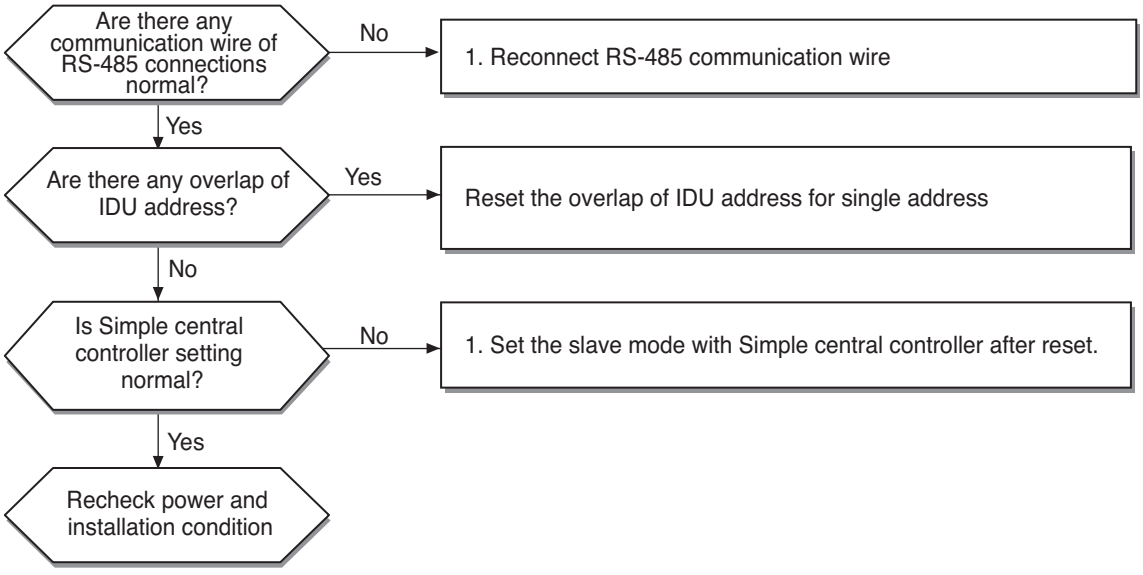
[NB] If Indoor units/communication cables of HR unit and cables of power 220V has been changed each other, communication parts and indoor will be burnt

HR Unit PCB

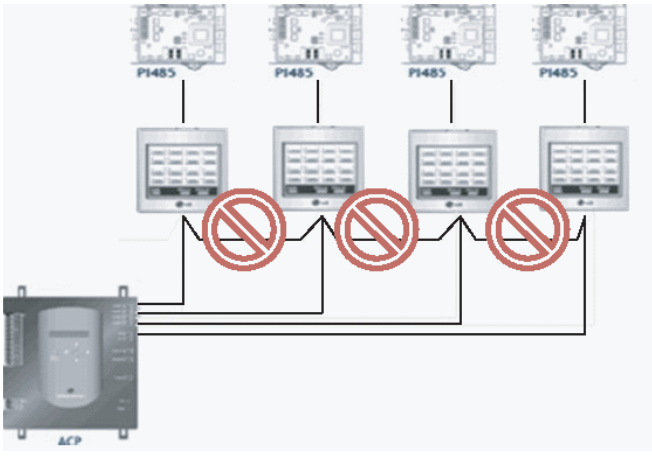


Error No.	Error Type	Error Point	Main Reasons
242* Master 2421	Network Error	Network error of central controller	1. RS-485 communication wiring defect 2. Communication defect between remote controller and indoor unit 3. RS-485 dip switch setting error 4. Indoor unit addressing ssetting error on central controller

■ Error diagnosis and countermeasure flow chart



<RS-485 communication wire miss connection>



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