Internal Use Only

http://biz.lgservice.com

MULTI V WATER II System

Outside Unit R410A

SERVICE MANUAL R410A

MODEL : ARWN Series
ARWB Series

CAUTION

Before Servicing the units, 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

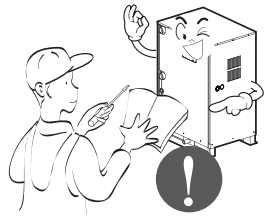
■ Installation

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.

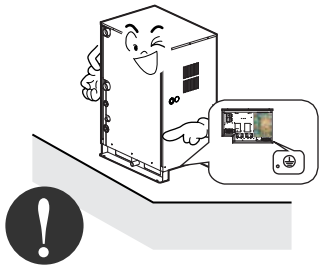
Ask the dealer or an authorized technician to install the air conditioner.

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



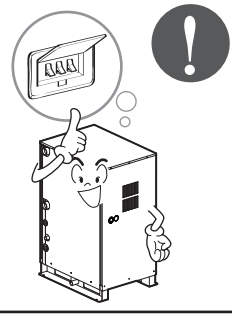
Always ground the product.

- There is risk of fire or electric shock.



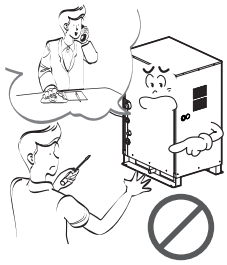
Always intstall a dedicated circuit and breaker.

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



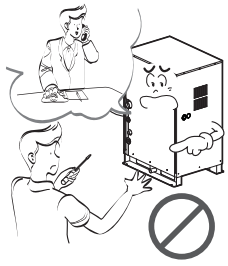
For re-installation of the installed product, always contact a dealer or an Authorized Service Center.

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



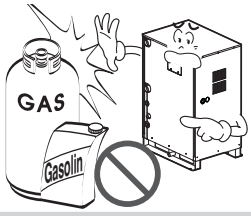
Do not install, remove, or re-install the unit by yourself (customer).

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



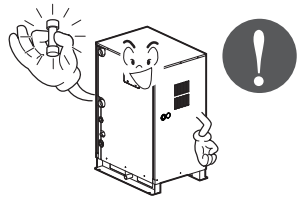
Do not store or use flammable gas or combustibles near the air conditioner.

• There is risk of fire or failure of product.



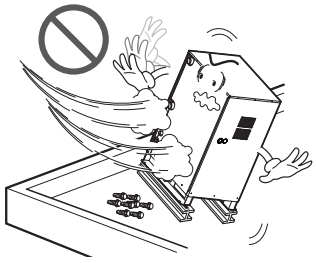
Use the correctly rated breaker or fuse.

• There is risk of fire or electric shock.



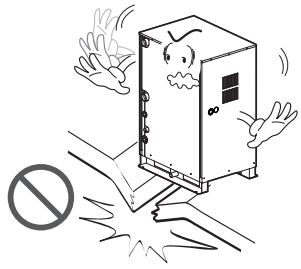
Prepare for strong wind or earthquake and install the unit at the specified place.

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



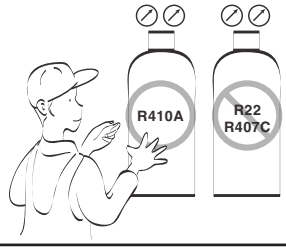
Do not install the product on a defective installation stand.

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



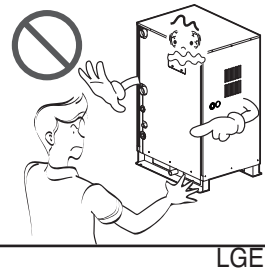
When installing and moving the air conditioner to another site, do not charge it with a different refrigerant from the refrigerant specified on the unit.

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



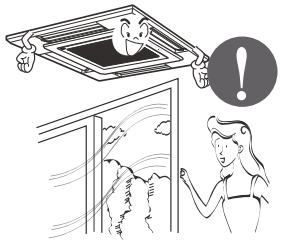
Do not reconstruct to change the settings of the protection devices.

• 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.



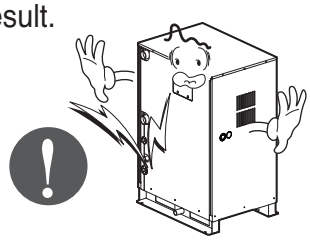
Ventilate before operating air conditioner when gas leaked out.

• It may cause explosion, fire, and burn.



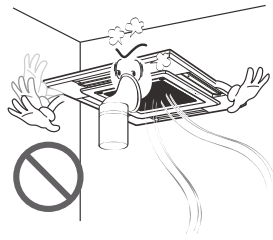
Securely install the cover of control box and the panel.

• 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.

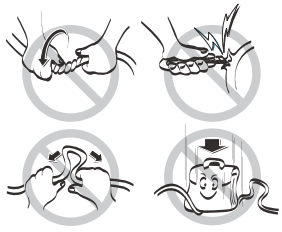
• Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, harzards due to lack of oxygen in the room could result.



■ Operation

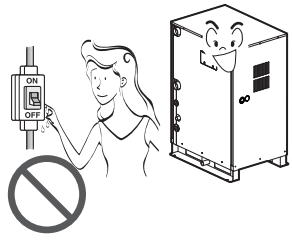
Do not damage or use an unspecified power cord.

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



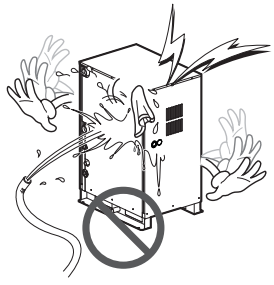
Use a dedicated outlet for this appliance.

• There is risk of fire or electrical shock.



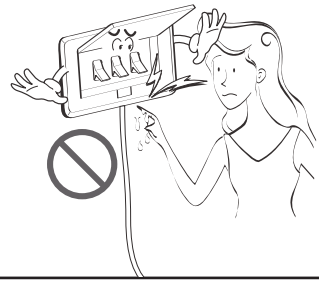
Be cautious that water could not enter the product.

• 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.

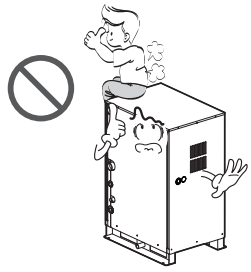


When the product is soaked (flooded or submerged), contact an Authorized Service Center.

• There is risk of fire or electric shock.

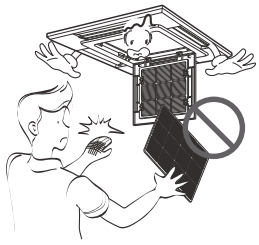
Take care to ensure that nobody could step on or fall onto the outside unit.

• This could result in personal injury and product damage.



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

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

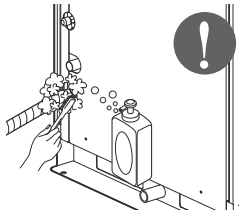


⚠CAUTION

■ Installation

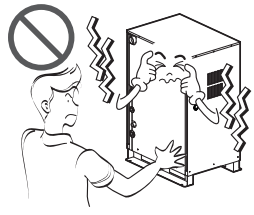
Always check for gas (refrigerant) leakage after installation or repair of product.

• Low refrigerant levels may cause failure of product.



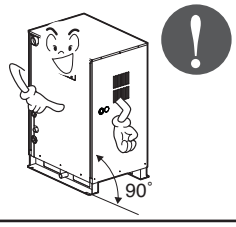
Do not install the product where the noise or hot air from the outside unit could damage the neighborhoods.

• It may cause a problem for your neighbors.



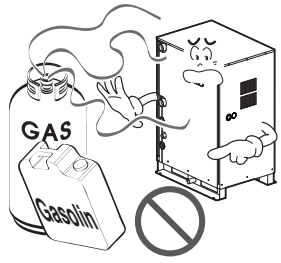
Keep level even when installing the product.

• To avoid vibration or water leakage.



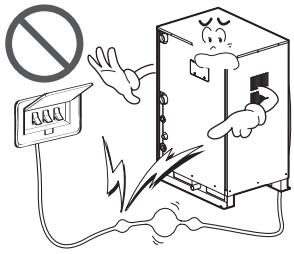
Do not install the unit where combustible gas may leak.

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



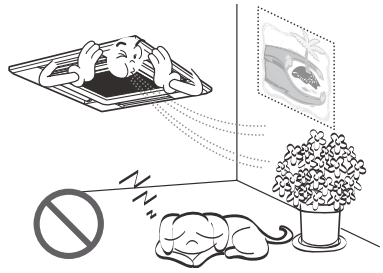
Use power cables of sufficient current carrying capacity and rating.

- 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.

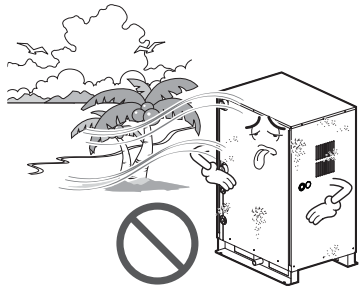


When installting the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.

- 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.

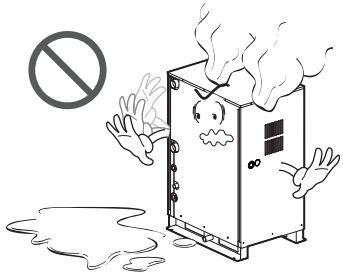
- It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.



■ Operation

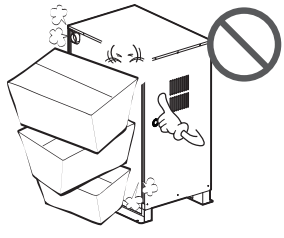
Do not use the air conditioner in special environments.

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



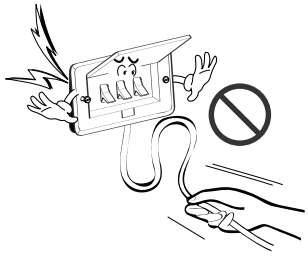
Do not block the inlet or outlet.

- It may cause failure of appliance or accident.



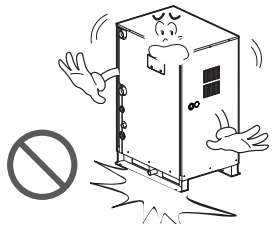
Make the connections securely so that the outside force of the cable may not be applied to the terminals.

• 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.

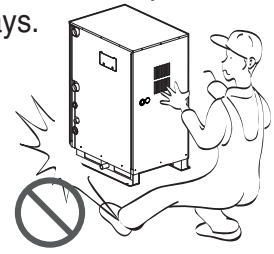


Install and insulate the drain hose to ensure that water is drained away properly based on the installation manual.

• 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.

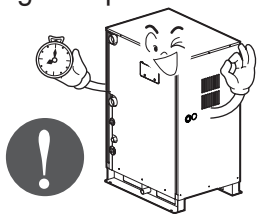


Safely dispose of the packing materials.

• 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.

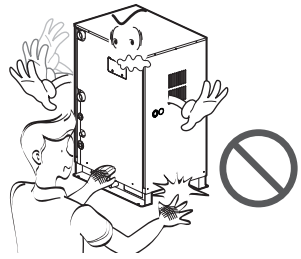
Turn on the power at least 6 hours before starting operation.

• 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.



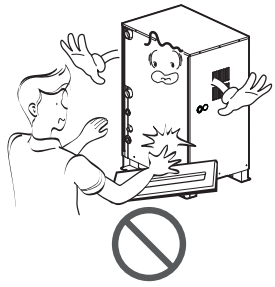
Do not touch any of the refrigerant piping during and after operation.

• It can cause a burn or frostbite.



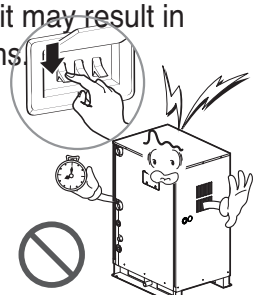
Do not operate the air conditioner with the panels or guards removed.

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

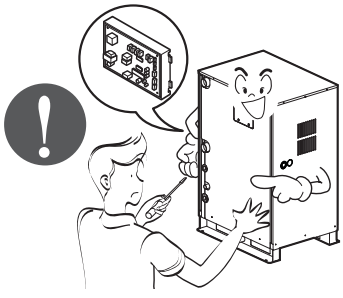


Do not directly turn off the main power switch after stopping operation.

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

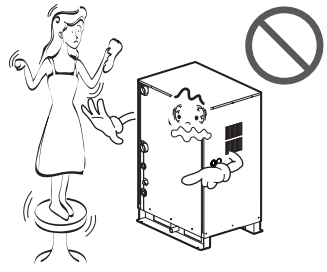


Auto-addressing should be done in condition of connecting the power of all indoor and outdoour units. Auto-addressing should also be done in case of changing the indoor unit PCB.



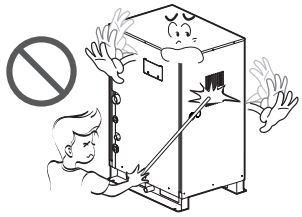
Use a firm stool or ladder when cleaning or maintaining the air conditioner.

• 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

1. Model Names

1.2 Outside Unit

■ Heat Pump

Power Supply	8HP (6.5 Ton)	16HP (12.5 Ton)	24HP (19.0 Ton)	32HP (25.5 Ton)	40HP (32.0 Ton)	48HP (38.0 Ton)
3Φ, 208/230V, 60Hz	ARWN072BA2	ARWN144BA2	ARWN216BA2	ARWN288BA2	ARWN360BA2	ARWN432BA2

Power Supply	10HP (8.0 Ton)	20HP (16.0 Ton)	30HP (24.0 Ton)	40HP (32.0 Ton)	50HP (40.0 Ton)	60HP (48.0 Ton)
3Φ, 460V, 60Hz	ARWN096DA2	ARWN192DA2	ARWN290DA2	ARWN390DA2	ARWN480DA2	ARWN580DA2

■ Heat Recovery

Power Supply	8HP (6.5 Ton)	16HP (12.5 Ton)	24HP (19.0 Ton)	32HP (25.5 Ton)	40HP (32.0 Ton)	48HP (38.0 Ton)
3Φ, 208/230V, 60Hz	ARWB072BA2	ARWB144BA2	ARWB216BA2	ARWB288BA2	ARWB360BA2	ARWB432BA2

Power Supply	10HP (8.0 Ton)	20HP (16.0 Ton)	30HP (24.0 Ton)	40HP (32.0 Ton)	50HP (40.0 Ton)	60HP (48.0 Ton)
3Φ, 460V, 60Hz	ARWB096DA2	ARWB192DA2	ARWB290DA2	ARWB390DA2	ARWB480DA2	ARWB580DA2

1.2 HR Unit

Power supply	2 rooms	3 rooms	4 rooms
1Ø, 220-240V, 50/60 Hz	PRHR020	PRHR030	PRHR040

2. External Appearance

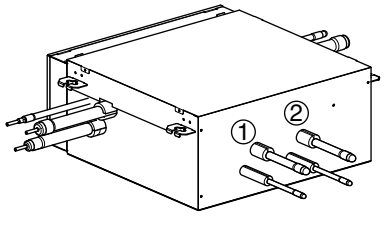
2.1 Outside Unit

ARWN072BA2 / ARWN144BA2
ARWN096DA2 / ARWN192DA2
ARWB072BA2 / ARWB144BA2
ARWB096DA2 / ARWB192DA2

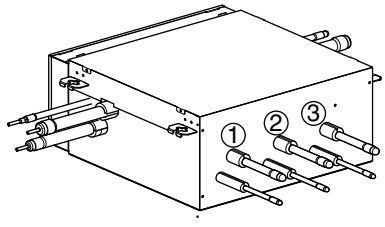
ARWN216BA2 / ARWN288BA2
ARWN290DA2 / ARWN390DA2
ARWB216BA2 / ARWB288BA2
ARWB290DA2 / ARWB390DA2

ARWN360BA2 / ARWN432BA2
ARWN480DA2 / ARWN580DA2
ARWB360BA2 / ARWB432BA2
ARWB480DA2 / ARWB580DA2

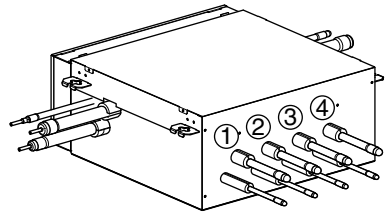
2.2 HR Unit



(For 2 rooms)



(For 3 rooms)



(For 4 rooms)

3. Combination of Outside Unit

■ 3Φ, 203/230V, 60Hz Heat Pump

System Capacity (HP)	Number of Units	Module(HP)	
		8	16
8	1	1	
16	1		1
24	2	1	1
32	2		2
40	3	1	2
48	3		3

■ 3Φ, 460V, 60Hz Heat Pump

System Capacity (HP)	Number of Units	Module(HP)	
		10	20
10	1	1	
20	1		1
30	2	1	1
40	2		2
50	3	1	2
60	3		3

■ 3Φ, 203/230V, 60Hz Heat Recovery

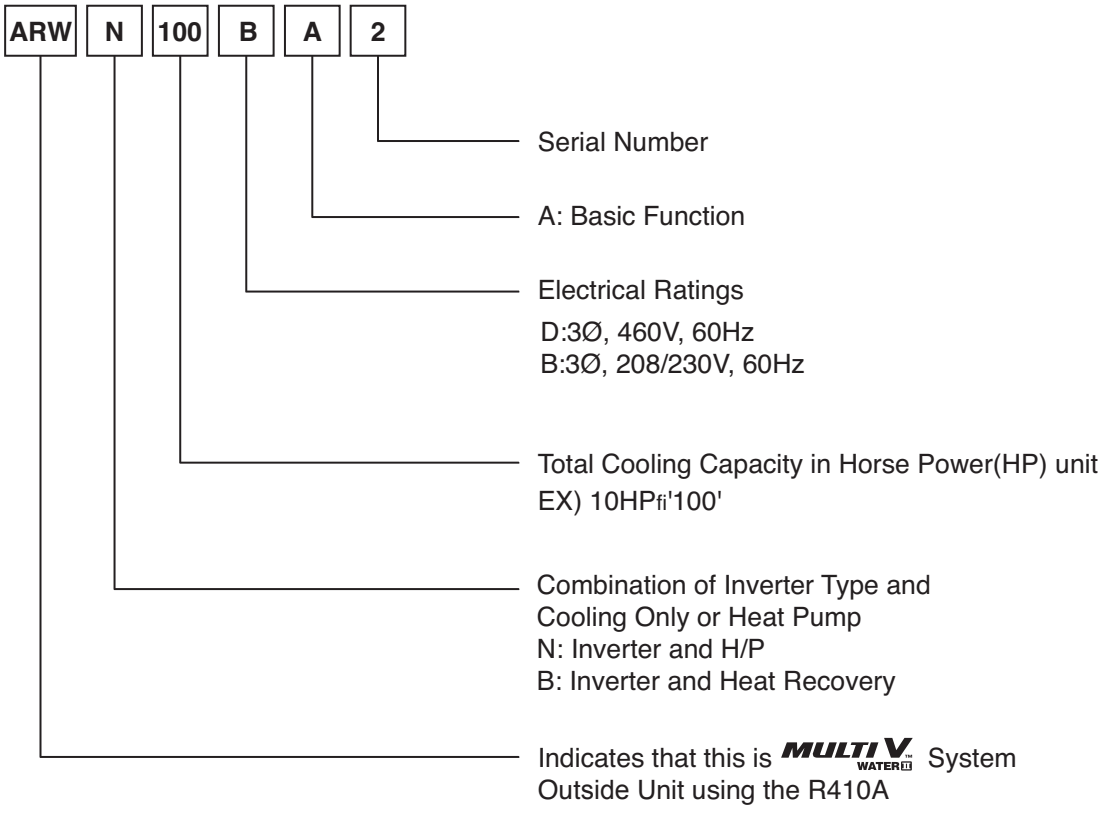
System Capacity (HP)	Number of Units	Module(HP)	
		8	16
8	1	1	
16	1		1
24	2	1	1
32	2		2
40	3	1	2
48	3		3

■ 3Φ, 460V, 60Hz Heat Recovery

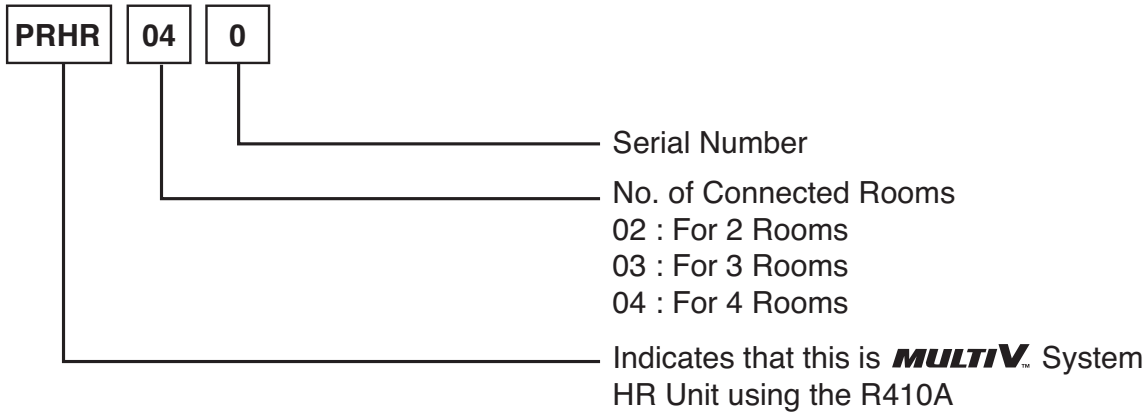
System Capacity (HP)	Number of Units	Module(HP)	
		10	20
10	1	1	
20	1		1
30	2	1	1
40	2		2
50	3	1	2
60	3		3

4. Nomenclature

4.1 Outside Unit



4.2 HR Unit



Part 2
Outside Unit

ARWN / ARWB Series

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	Before 15 min. : Max. pulse After 15 min. : Min. pulse
4 way valve	Off	On	After 60 min. : Off
Subcooling EEV	Fuzzy control	• Normal : minimum pulse • Avoiding control of high discharge temperature	Before 15 min : Min. pulse After 15 min : initial state
Indoor Unit EEV	Superheat fuzzy control	Subcooling fuzzy control	Before 10 min. : Min. pulse After 10 min. : Max. pulse

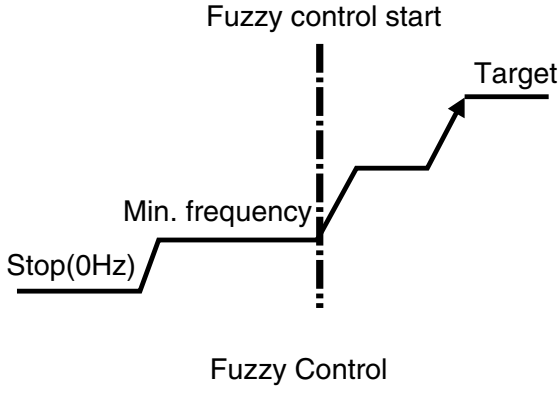
Note : Heating operation is not functional at an outside air temperature of 27°C or more.
Cooling operation is not functional at an outside air temperature of 2°C or less with indoor unit combination of 10% or less

1.2 Compressor control

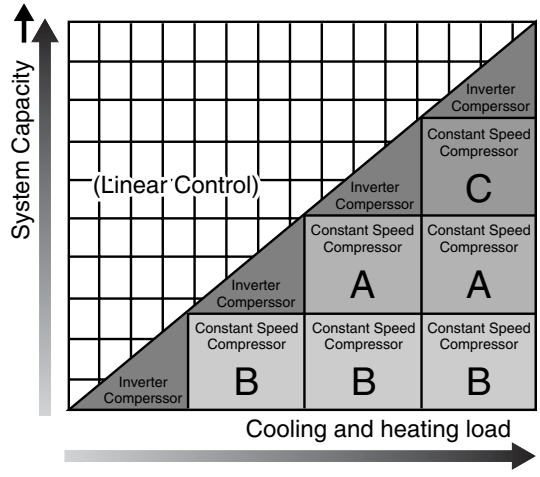
Fuzzy control : Maintain evaporating temperature(Te) to be constant on cooling mode and condensing temperature(Tc) on heating mode by Fuzzy control to ensure the stable system performance.
(Tc:47 ~51°C, Te:2 ~ 5°C)
(1) Cooling mode
Te can be set by initial dip switch setting. (Normal mode, capacity up mode, and energy save mode)

(2) Heating mode
Tc can be set by initial dip switch setting. (Normal mode, capacity up mode, and energy save 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)at the evaporator outlet stable during heating mode
The degree of Superheat = Tsuction - Tevaporation
Tsuction : temperature at suction pipe sensor(°C)
Tevaporation : evaporation temperature equivalent to low pressure(°C)

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

(3) Avoiding excessive high discharge temperature : when main EEV opens some given opening (R22 : 1000pls, R410A : 800 pls) and discharge temperature is above 85°C in heating operation, subcooling EEV may control the "subcooling out temperature-evaporating temperature" to be some given difference.

2. Special control

2.1 Oil return control

2.1.1 Oil return control on cooling mode

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

Outside Unit

Component	Starting	Running	Ending
Inv Compressor	25Hz	Setting Value	40Hz
Constant Speed Compressor	OFF	ON	OFF
Main EEV	Max. pulse	Max. pulse	Max. pulse
Subcooling EEV	Normal control	Min. pulse	100 pulse
4way valve	OFF	OFF	OFF
Hot gas bypass valve	Normal control	Normal control	Normal control

Indoor Unit

Component	Starting	Running	Ending
Thermo on unit EEV	Normal control	1200 pulse	Normal control
Thermo off unit EEV	Min. pulse	1200 pulse	Min. pulse
Oil return signal	OFF	ON	OFF

- Oil return operation time : 3 min for running step
- Starting condition:every 6 hours operate
- 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	25Hz	Setting Value	25Hz
Constant Speed Compressor	OFF	ON	OFF
Main EEV	Max. pulse	Max. pulse	Max. pulse
Subcooling EEV	Normal control	Min. pulse	100 pulse
4way valve	OFF	OFF	ON
Hot gas bypass valve	Normal control	Normal control	Normal control

Indoor Unit

Component	Starting	Running	Ending
Thermo on unit EEV	Normal control	1200 pulse	Normal control
Thermo off unit EEV	Min. pulse	1200 pulse	Min. pulse
Oil return signal	OFF	ON	OFF

- 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	0Hz	-
Constant Speed Compressor	OFF	-
Main EEV	Max. pulse	After 15 min. (Before 15 min. : Min. pulse)
Subcooling EEV	Min. pulse	After 15 min. (Before 15 min. : Min. pulse)
4way valve	OFF	-
Hot gas bypass valve	OFF	After 15 min. (Before 15 Min. : ON)

2.2.2 Stopping operation on heating mode

Component	Operation	Note
Inv Compressor	0Hz	-
Constant Speed Compressor	OFF	-
Main EEV	Max. pulse	After 15 min. (Before 15 min. : Min. pulse)
Subcooling EEV	Min. pulse	After 15 min. (Before 15 min. : Min. pulse)
4way valve	OFF	After 60 min.
Hot gas bypass valve	OFF	After 15 min. (Before 15 Min. : ON)

3. Protection control

3.1 Pressure protection control

3.1.1 Pressure control on cooling mode

■ **High pressure control**

Pressure Range	Compressor	Hot_gas
$P_d \geq 4003$ kPa	Stop	-
$P_d > 3676$ kPa	-5Hz/4sec.	
$P_d \geq 3448$ kPa	Frequency holding	
$P_d < 3284$ kPa	Normal control	-

■ **Low pressure control**

Pressure Range	Compressor	Hot_gas
① $P_s \leq 229$ kPa after 1min	Stop	On
② $P_s \leq 229$ kPa before 1min	-5Hz/4sec.	
③ $P_s \leq 242$ kPa	Normal control	
$P_s \geq 399$ kPa	Normal control	Off

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

3.1.2 Pressure control on heating mode

■ **High pressure control**

Pressure Range	Compressor	Hot_gas
P_d 4003kPa	Stop	On
$P_d > 3676$kPa	-5Hz/4sec.[1)]	On
P_d 3448kPa	Normal control	
P_d Target press	Normal control	off

■ **Low pressure control**

Pressure Range	Compressor	Hot_gas
① P_s 686 kPa after 3min	Stop	On
② P_s 739 kPa	-5Hz/7sec.	

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

3.2 Discharge temperature control

■ **Outside unit control**

Temperature range	Compressor	Liquid injection	Subcooling EEV
Tdis >115˚C	System stop		
105˚C<Tdis ≤112˚C	Frequency down + const. Comp off	On	Max. limit 490 pulse
98 ˚C<Tdis ≤103˚C	Liquid injection on No frequency up	Keep state OFF (below 100°C)	Max. limit 490 pulse
Tdis ≤98˚C	Pressure control	Off	Max. limit 300 pulse
Tdis >95˚C	Pressure control	Off	10 pulse open /10sec

■ **Indoor unit control**

Temperature range	EEV
Tdis >115 ˚C	System stop
103˚C < Tdis ≤115˚C	Emergency SH control
98 ˚C<Tdis ≤103 ˚C	Keep current control
Tdis ≤98 ˚C	SH control

3.3 Inverter protection control

	Normal Operation	Frequency Down	System Stop
AC Input Current	18A or less	18A or more	20A or more
Compressor Current	28A or less	28A or more	30A or more

❊ AC input current is inverter input current except constant speed compressor current(Noise filter passed current)

3.4 Liquid back control

■ **Cooling mode**

Discharge temperature	Indoor unit's EEV
Tdis < Tc + 12˚C	SH increasing control
Tdis > Tc + 16˚C	Normal SH control

■ **Heating mode**

Discharge temperature	Outside unit's EEV
Tdis < Tc + 17˚C	SH increasing control
Tdis > Tc + 18˚C	Normal SH control

※ The logic starts after 9 min. on heating mode and 4 min. on cooling mode from the compressor running.

3.5 Phase detection

■ Main unit

If a phase is missed, 7-segment displays 50* on main PCB.
If phases are reversed, 7-segment displays 54* on main PCB.

3.6 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 pump : Display 2 is default value Cooling only : no display	
Factory setting(25 is normal)	
Refrigerant display	

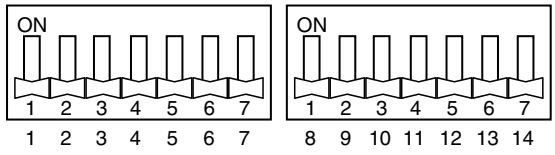
2) Step 2 : Communication check
- If all model code is displayed in 7 segment including all Slave unit, communication between outside units is normal.
- If 104* is displayed in 7-segment, check communication wires between outside units and Dip switch setting.

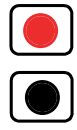
3) Step 3 : PCB error check
- After 40 sec, error check begins.

■ 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 communication between main PCB and fan PCB isn't normal, 105* 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.

Push address(red) button for 6 sec.





Auto address starts

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

The number of indoor units is displayed for 30 sec.

(35 indoor units found)

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

4.2 Emergency operation

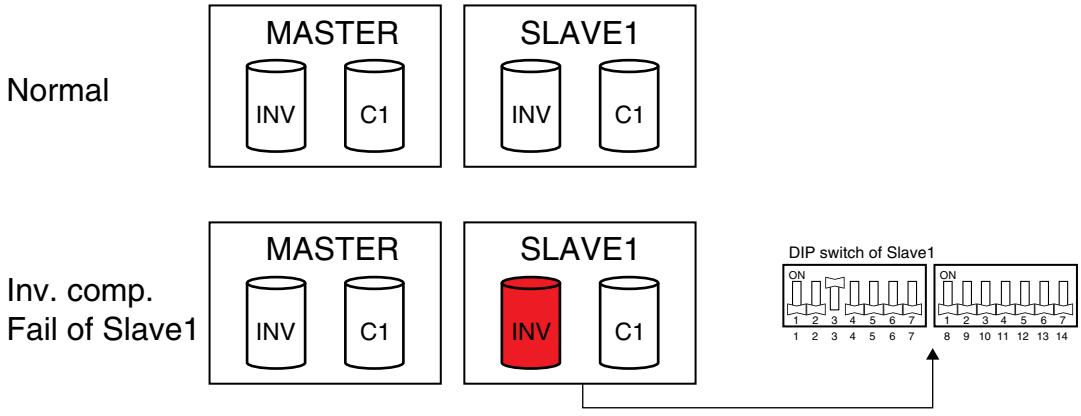
- If a compressor is out of order, the system can be run except the defective compressor by backup function.

■ Automatic emergency operation(automatic back up function)
If outside unit detect comp defect during operation,, automatic back up mode is set.

1) Inverter compressor automatic emergency operation(refer to ** page)
2) Constant compressor automatic emergency operation(refer to ** page)

■ Manual emergency operation(Manual back up function)

1) Check which compressor is broken.(refer to °∞Trouble Shooting Guide°±)
2) Turn off the power.
3) Set the dip S/W of defective outside unit.
   - Inverter compressor defect : dip S/W No.3
   - Unit defect : dip S/W No.4
4) Turn on the power.



CAUTION

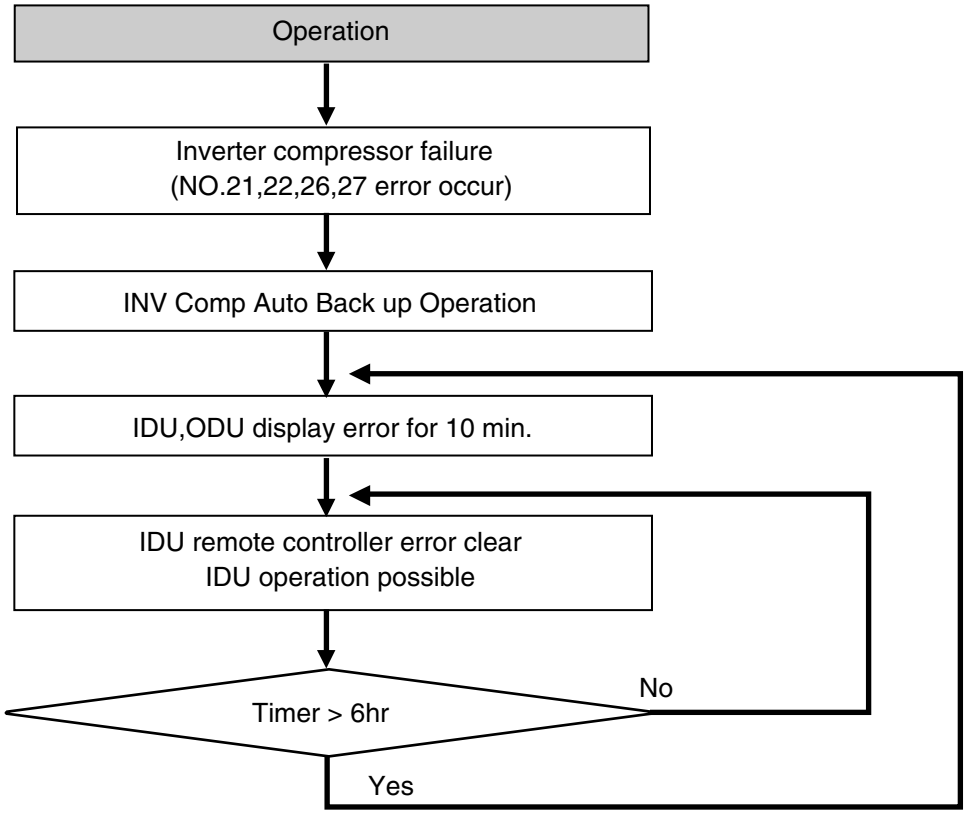
Emergency operation with inverter compressor failure should not last 48 hours. ➔ It causes other compressor failure.

During the emergency operation, cooling/heating capacity may be lower.

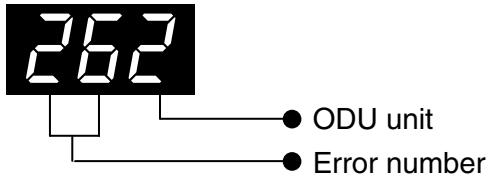
4.3 Auto Back Up Function_Inverter compressor

This function allows the system to operate in case of inverter compressor failure by backing up compressor automatically.

SVC can be asked by displaying error to the customer every 6 hours.



Example) Slave1 Unit INV Comp start failure error occur

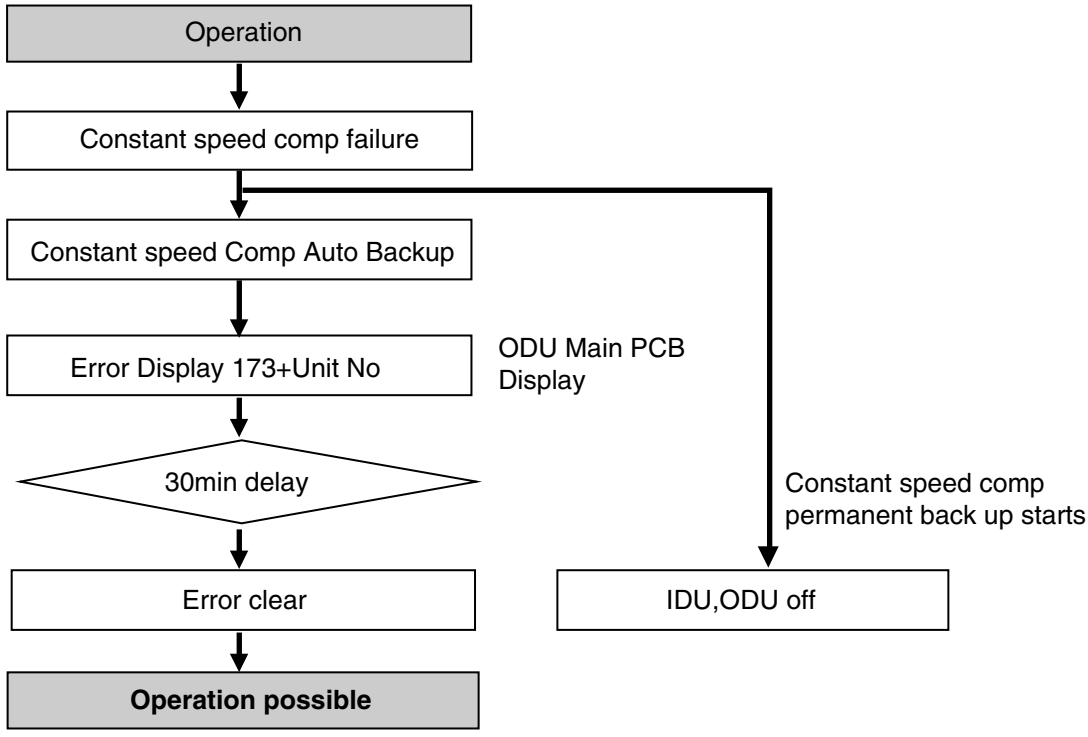


⚠ Caution

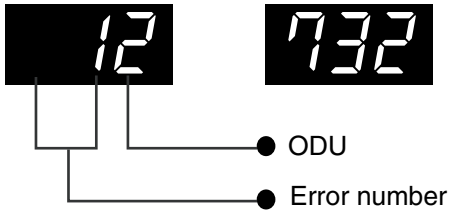
1. Request SVC immediately if error occurs.
2. Auto back up is set up to 1 inverter Comp
3. If Inverter Comp Auto Back up starts, error displays for 10 min. every 6 hours.
4. Error displays continuously at the corresponding ODU.

4.4 Auto Back Up Function_constant speed compressor

This function allows the system to operate in case of constant speed compressor failure by backing up compressor automatically.



Example) Slave1 Unit constant speed Comp failure(No.173)

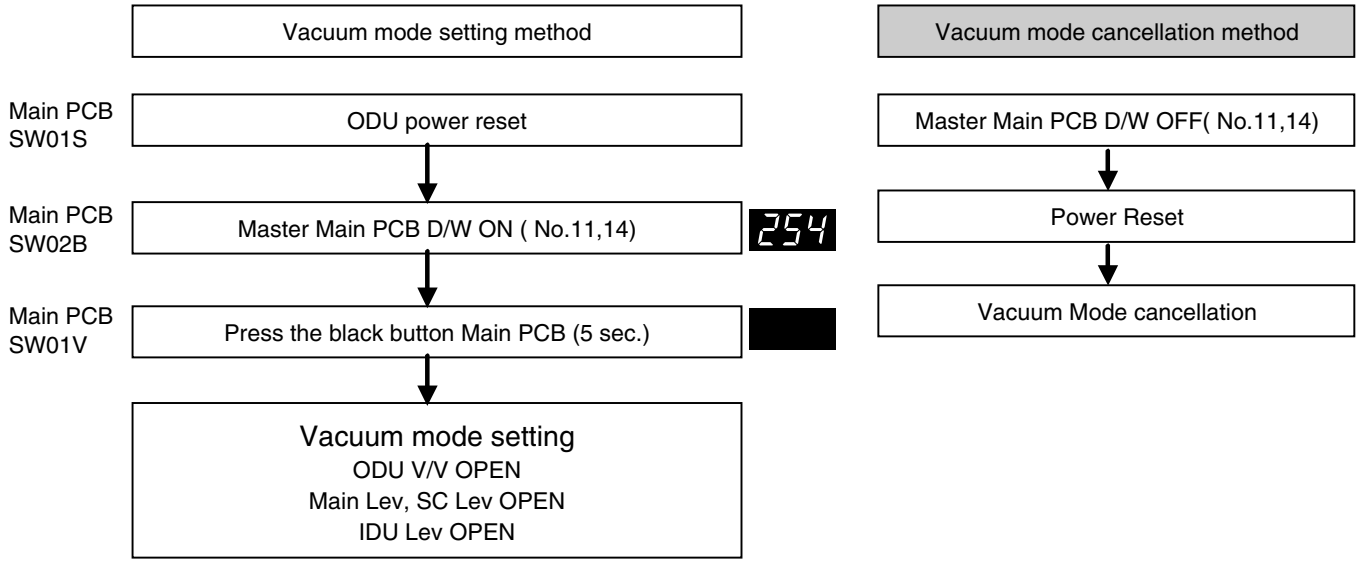


⚠ Caution

1. Request SVC immediately if error occurs

4.5 Vacuum Mode

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



⚠ Caution

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

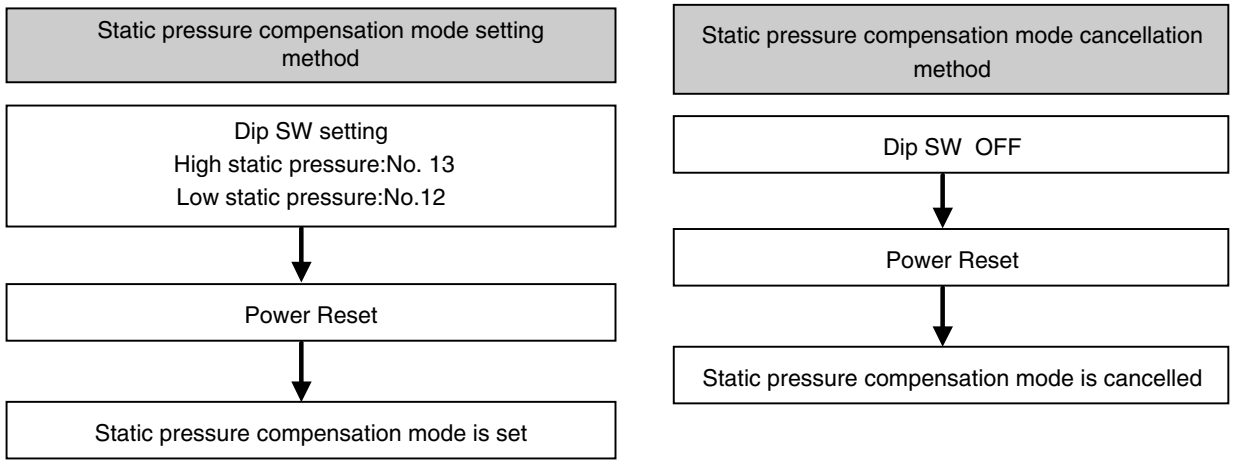
4.12 Static pressure compensation mode

This function secures the air flow rate of ODU, in case static pressure has been applied like using duct at fan discharge of ODU.

■ Static pressure compensation dip S/W setting method

High static pressure mode (Max. RPM 930) : Master ODU Main PCB SW02B NO.13 Dip S/W

Low static pressure mode (Max. RPM 900) : Master ODU Main PCB SW02B NO.12 Dip S/W



4.6 Black Box Function

This function saves data immediately before the error occurs in ODU main PCB, and thus making error analysis cause possible.

Data Loading Method

IDU, ODU stop

↓

Press the black button (5 sec.)

↓

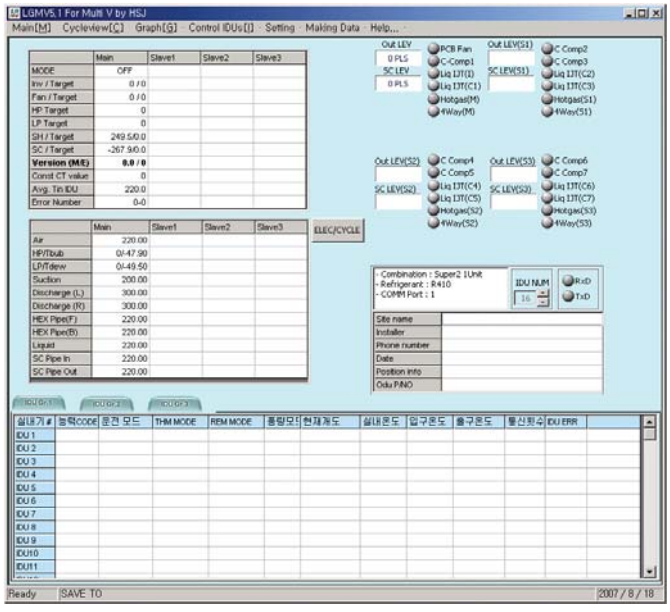
EEPROM ➠ Main Micom data Loading

Yellow LED(LED01C) stops when data is loading
After completion, it is starts blinking (about 20 sec.).

↓

EEPROM data save to PC by using
<Save EEP data> in LGMV

■ Saving process : Making Data ➠ Save EEP data ➠ data saving place select ➠ file save



Part 3
PCB Setting and Test Run

Test Run

1. Checks Before Test Run

1	Check to see whether there is any refrigerant leakage, and slack of power or transmission 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

- **Always apply main power of the outside unit during use of product (cooling season/heating season).**
- **Always apply power before 6 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 6 hours.(In case of the outside temperature below 10°C)**
- **When operating the unit after powering off, automatically run into in the preheat mode for 3 hours and "PH" is indicated on the outside unit 7-Segment.**

CAUTION

Preheat of compressor

- **Start preheat operation for 3 hours after supplying main power.**
- **In case that the outside temperature is low, be sure to supply power 6 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 amount 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 connector
	No operating sound at applying power	Coil failure	Check resistance between terminals
	Heating failure, frozen outside heat exchanger part	EEV clogged	Service necessary
	Low pressure error or discharge temperature error	EEV clogged	Service necessary

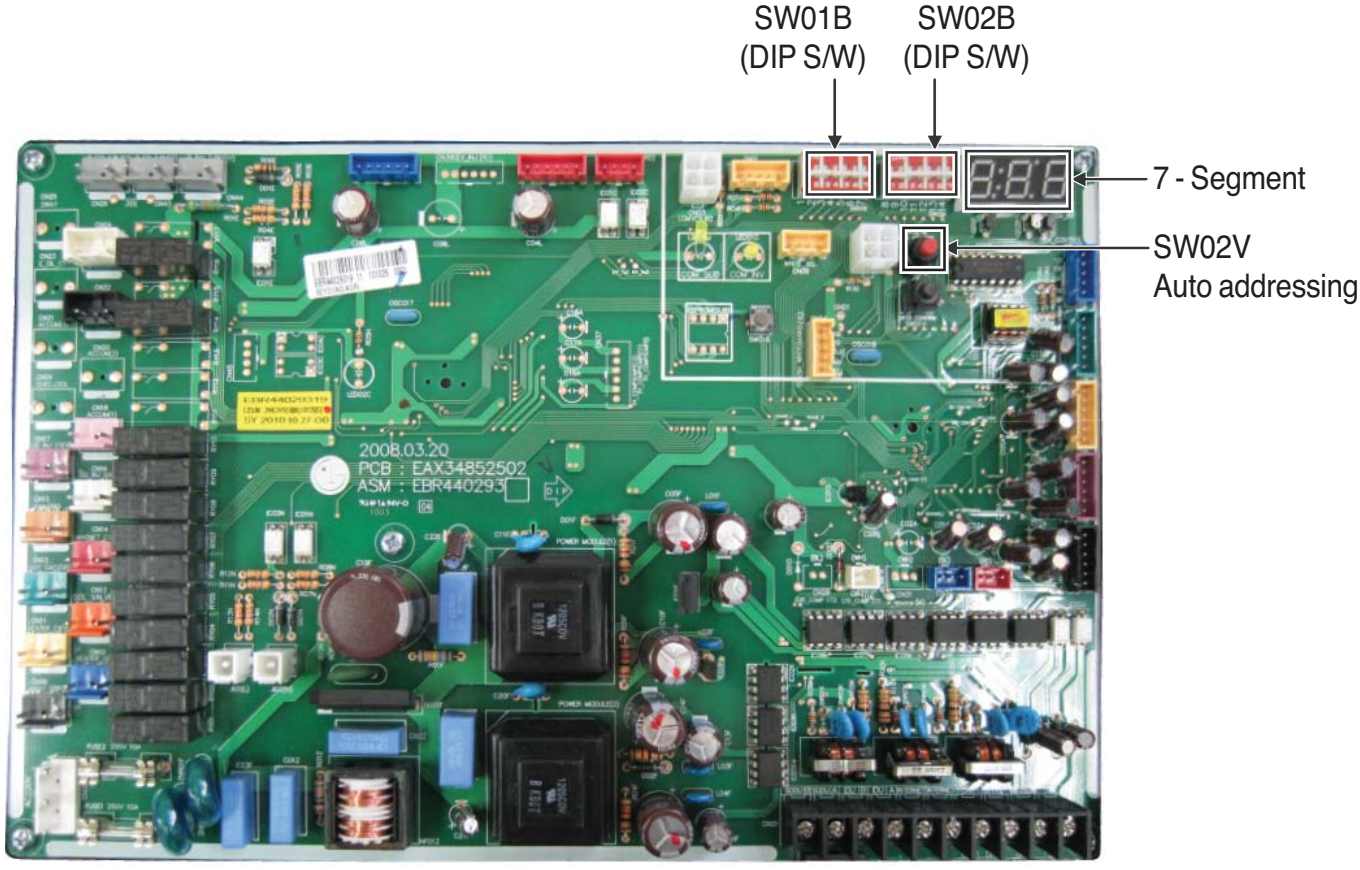
When system fault occurs, the error code is displayed at indoor unit display or remote control display, the trouble shooting guide is in the service manual

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

3. DIP Switch Setting

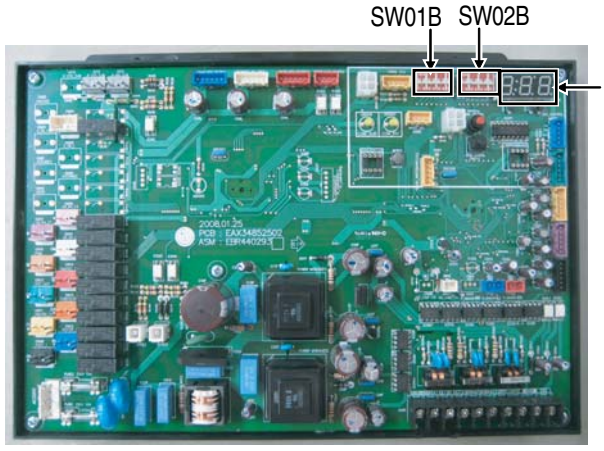
3.1 Location of setting Switch

Main PCB

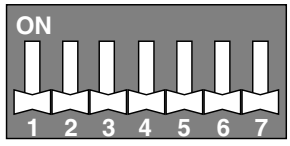


3.2 Dip switch setting

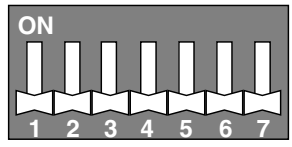
3.2.1 Location of setting switch



SW01B



SW02B



⚠CAUTION

If the applicable dip switch is not set correctly, the product may not operate properly.

3.2.2 Dip switch setting

1. Set the dip switch and turn on the power of the outside unit to check whether the set value is correctly entered in the 7 segment.
2. This function is shown for only 2 seconds after the power is connected.

■ Check outside unit setting

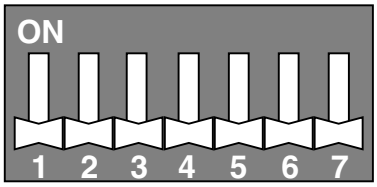
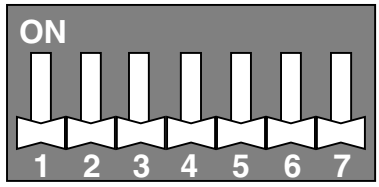
• The number on the 7 segment is displayed in order after the power is connected.
• This number represents the setting condition.

Order	Number	Item
1	-	Model code
2	-	Total capacity in horsepower (Ex)
3	2	-
4	25	Normal mode display (If the dip switch is set incorrectly, it is not displayed.)
5	41	Refrigerant type (R410A)

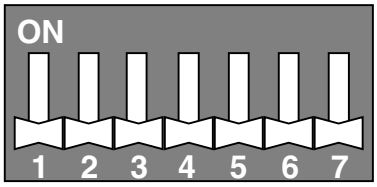
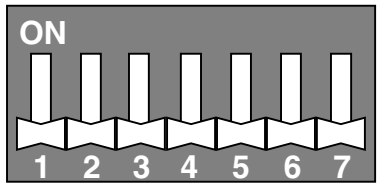
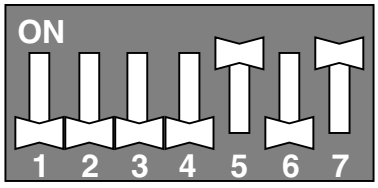
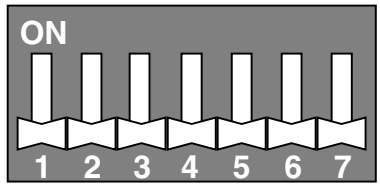
■ Mode code

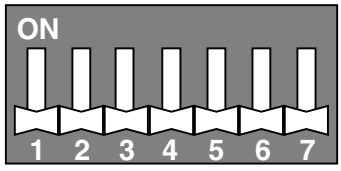
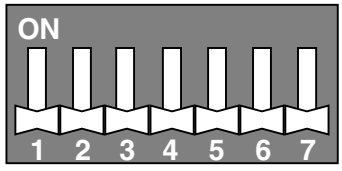
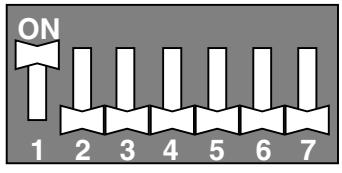
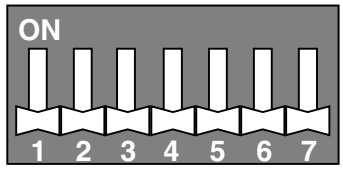
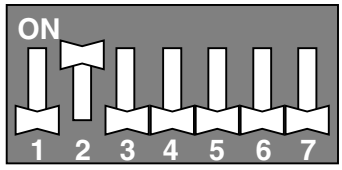
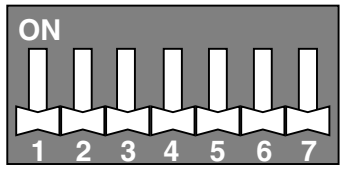
Model Code	Capacity	Refrigerant
34	29	R410A
35	58	
36	87	
37	116	

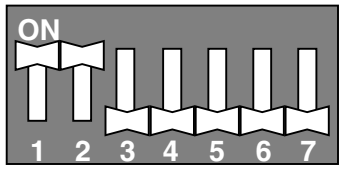
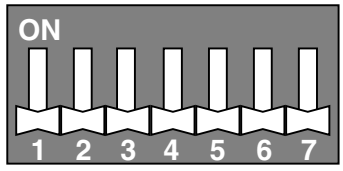
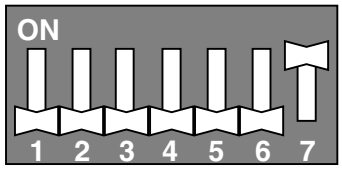
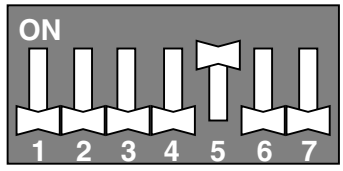
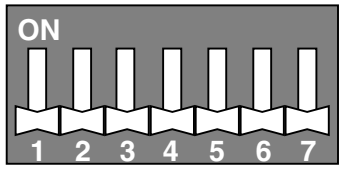
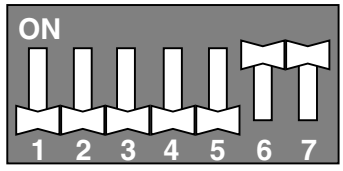
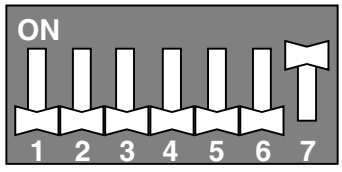
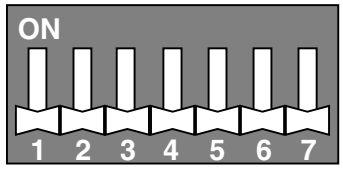
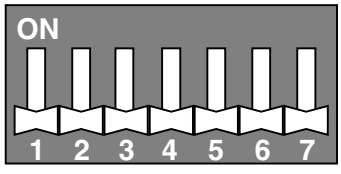
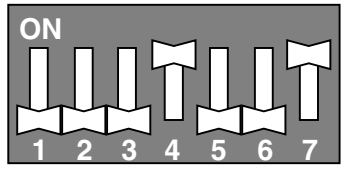
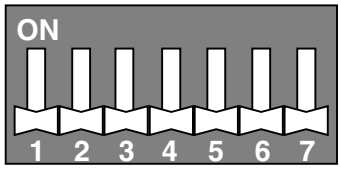
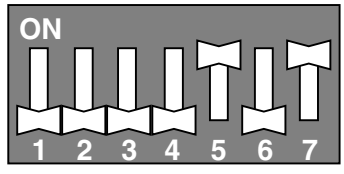
■ Master indoor Setting

SW01B Setting	SW02B Setting	Remark
		Normal mode at shipping factory

■ Slave outside Setting (1 unit: master outside)

SW01B Setting	SW02B Setting	Remark
		Normal mode at shipping factory
		Slave1 outside setting (at the 2units)

Function	SW01B Setting	SW02B Setting	Remark
Standard			Standard mode at shipping factory
Short Pipe Length			
Long Pipe Length			

Function	SW01B Setting	SW02B Setting	Remark
longest Pipe Length			Standard mode at shipping factory
Water temp checking			After the system turn on, Dip Switch 7,12 are completed is indicated on 7-Segment
COP checking mode			
Forced Oil Return			
Vacuum Mode			
Water Pipe Solenoid Valve 220V Functions			For water pipe Solenoid Valve 220V power

⚠CAUTION

- After operating the dip switch to set the additional function, you must reset the power of the main PCB to reflect the changed function. (After recovering the dip switch to cancel the additional function, you must reset the power of the main PCB to reflect the change.)
- If the dip switch is not set accurately, it can have excessive load on the product operation. Set the dip switch properly.

Replacement procedure for Compressor(ARWN80*A2 to ARWN600*A2)

Replacement procedure for Compressor(ARWN80*A2 to ARWN600*A2)

1) Collect the refrigerant by using refrigerant recovery unit
(Since the setting on outside unit PCB is required for refrigerant recovery, refer to the warming plate

″Precautions in service work″ attached on the switch box cover)

2) Remove the sound insulator mat covering the faulty compressor, and disconnect the power

3) Disconnect the brazing sections of suction pipe and discharge pipe by using brazing torch after the refrigerant has been collected completely.

4) Remove equalizing pipe nut.

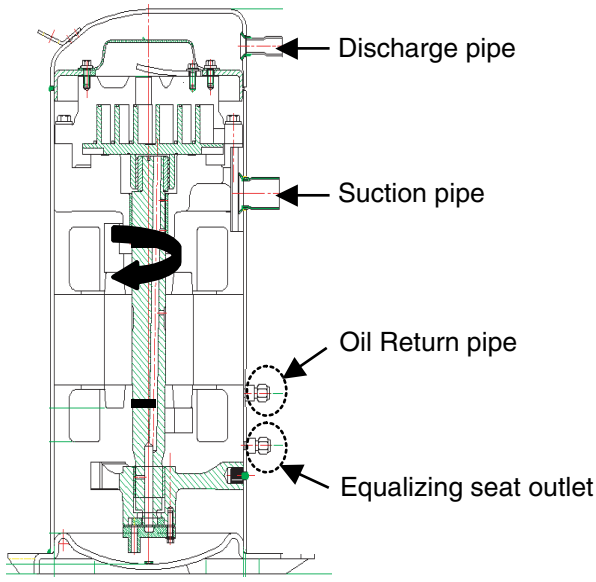
5) Remove three bolts at cushion rubber section to take out the faulty compressor outside the unit.

6) Install the new compressor in the unit.(Be sure to insert the cushion rubbers before tightening the fixing bolts of compressor.)

7) Remove the rubber caps put on the suction and discharge pipe of the new compressor to release.the sealing nitrogen gas.(Take note that oil may spout due to the pipe inside pressure if the plug put on the equalizing seat is removed before removing of rubber cap.)

8) Fasten equalizing pipe with nut.(14 ~ 18N.m)

9) Braze the suction and discharge pipe with brazing torch to the compressor.



Cut section

10) Conduct air tight test to check the piping system is free from leakage.

11) Connect power cable to the terminal board of compressor and cover the compressor with sound insulator mat.

12) Conduct vacuum drying.(Since the setting on outside unit PCB is required for vacuum drying, refer to the warning plate recautions in service work" attached on the switch box cover.)

13) Charge refrigerant after the completion of vacuum drying, and check the function of compressor with cooling or heating operation.

Part 4
Trouble shooting guide

Trouble shooting guide

1. The phenomena from main component failure

The phenomena from main component failure

Component	Phenomenon	Cause	Check method and Trouble shooting
Compressor	Not operating	Motor insulation broken	Check resistance between terminals and chassis
		Strainer clogged	Change strainer
		Oil leakage	Check oil amount 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
	Heating failure, frozen outside heat exchanger part	EEV clogged	Service necessary
	Low pressure error or discharge temperature error	EEV clogged	

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

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

2. Checking Method for Key Fompornents

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>Does failure appears again when starting operation?

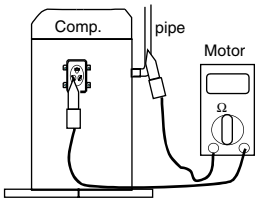
Method to measure insulation resistance
 

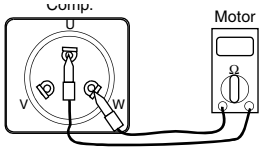
Figure 1.
Method to measure coil resistance
 

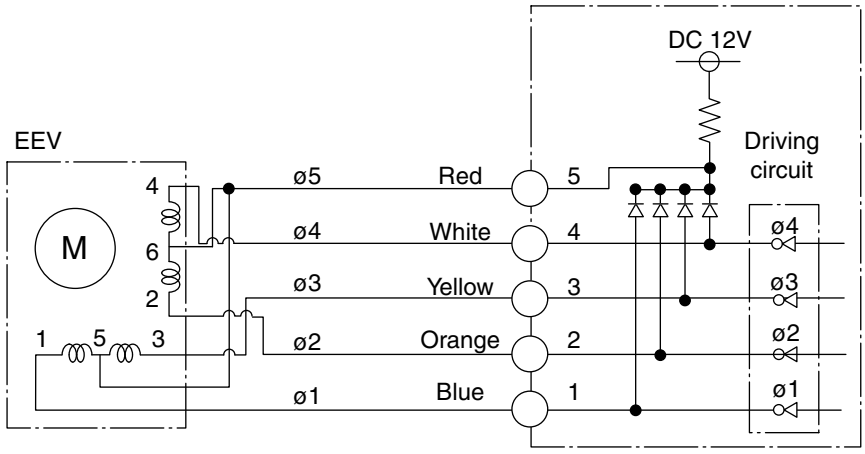
Figure 2.</td><td>1) The compressor stops andsame error appears again.</td><td>* Check IMP may fail.</td></tr>
<tr><td>2) If output voltage of the inverter is stably output. *1</td><td>* Check coil resistor and insulation resistor. If normal, restart the unit. If same symptom occurs, replace the compressor.
* Insulation resistor: 2MW or more
Coil resistor:
<table><tr><th></th><th>Inveter</th><th>Constant</th></tr><tr><td>U-V</td><td>0.35±7%Ω</td><td>1.96±7%Ω</td></tr><tr><td>V-W</td><td>0.35±7%Ω</td><td>1.91±7%Ω</td></tr><tr><td>W-U</td><td>0.35±7%Ω</td><td>1.99±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

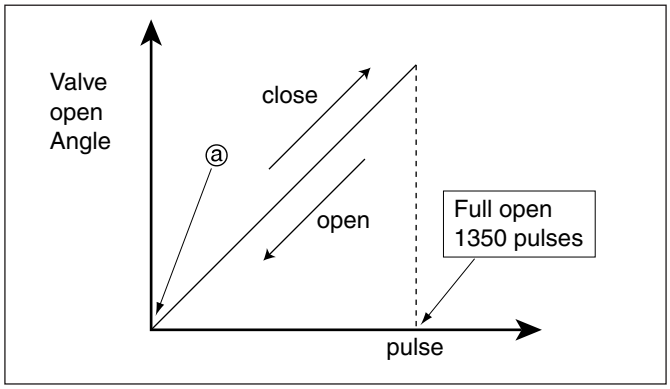
Output(ø) No.	Output state										
	1	2	3	4	5	6	7	8	9	10	11
ø1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
ø2	ON	ON	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF
ø3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
ø4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF

• Output pulse sequence

- In valve close state: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11 → 1
- In valve open state: 11 → 10 → 9→ 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 11

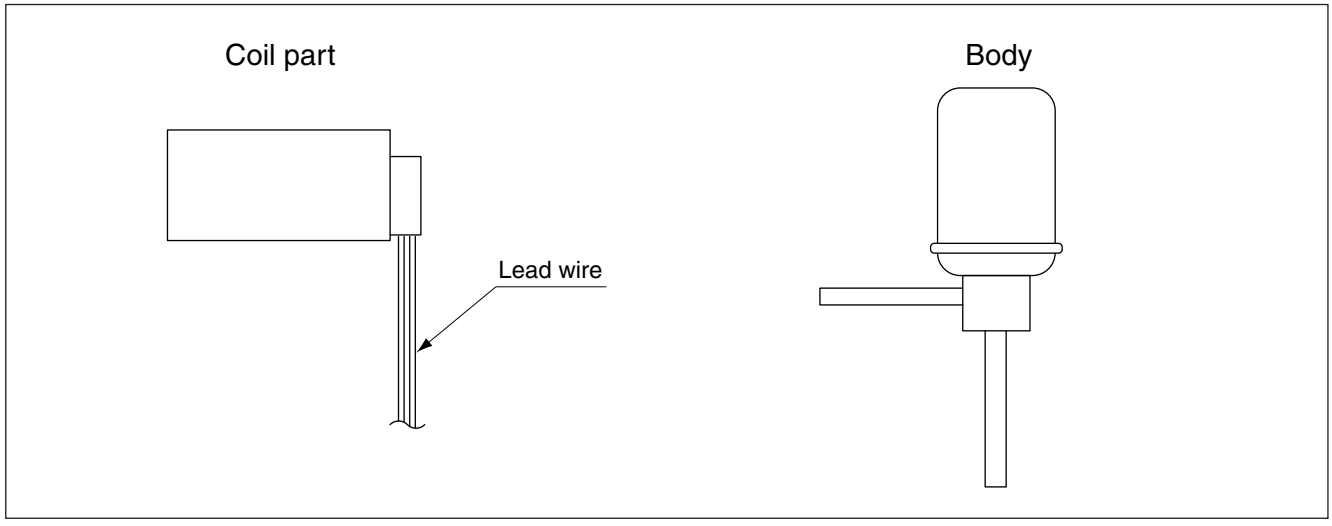
* 1. If EEV open angle does not change, all of output phase will be OFF
2. If output phase is different or continuously in the ON state, motor will not operate smoothly and start vibrating.

• EEV valve operation

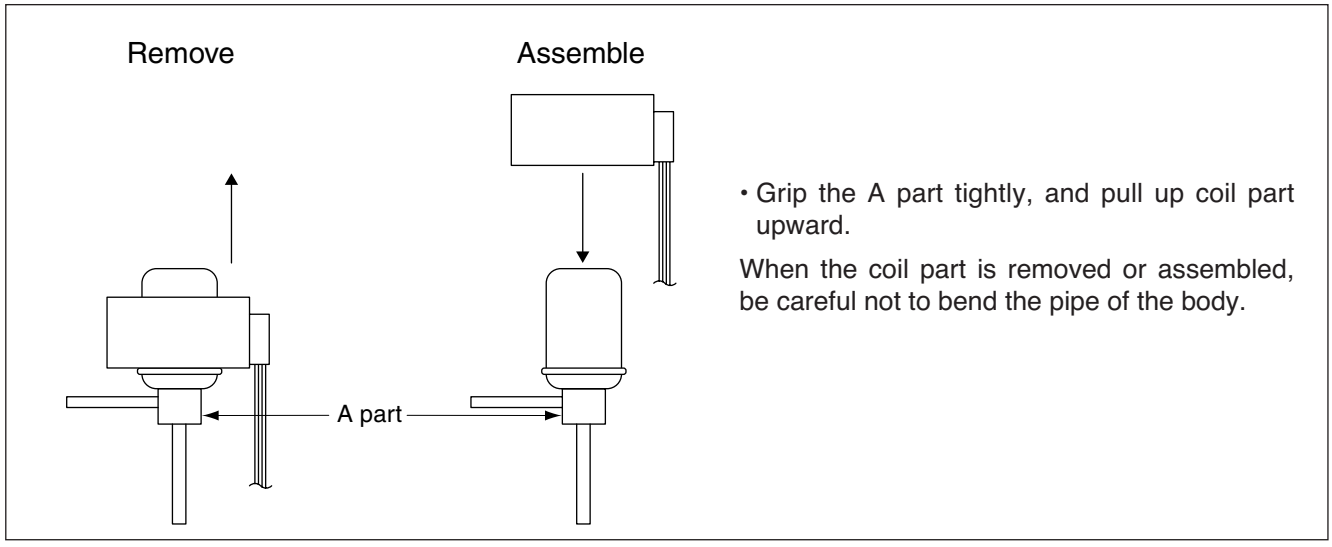


- At power ON, open angle signal of 1400 pulses output and valve position is set to ⓐ
  If valve operates smoothly, no noise and vibration occurs and if valve is closed. noise occurs.
- Noise from EEV can be confirmed by touching the EEV surface with a screw driver and listening the EEV noise.
- If liquid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

• EEV Coil and body(Outside unit)



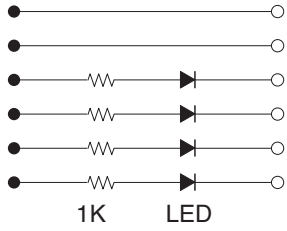
• Remove and assemble the coil



• Grip the A part tightly, and pull up coil part upward.

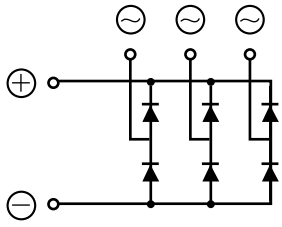
When the coil part is removed or assembled, be careful not to bend the pipe of the body.

- **EEV failure check method**

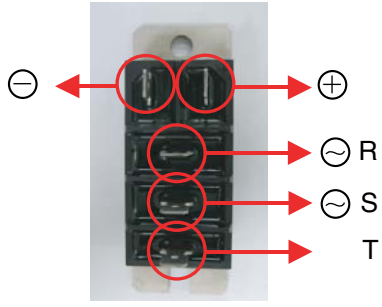
Failure mode	Diagnosis	Repair process	Unit
Microcomputer Driving circuit failure	1.Disconnect the EEV connector form control board and connect testing LED  2. Main power ON, pulse signal is out from EEV for 17 sec. If LEDs do not turn on, or are in on state continuously, then driving circuit is abnormal	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 inverter PCB DC voltage gets discharged, after the main power switch off.
2. Pull out all the connectors connected with 3 phase bridge diode.
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 inverter PCB assembly(IPM) is needed to be replaced.

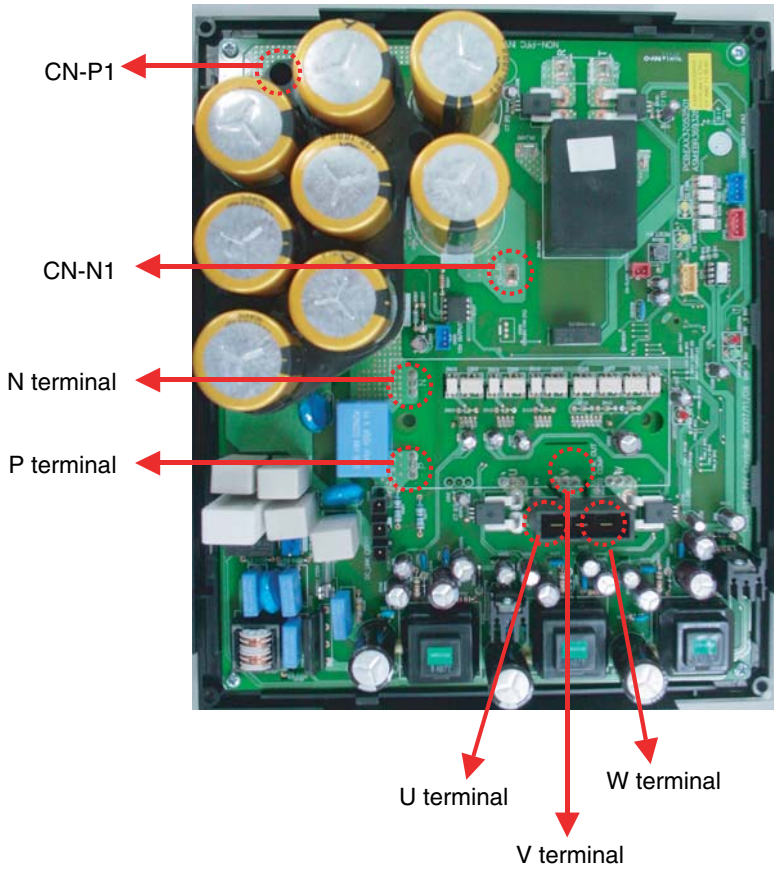
Diode terminal / Tester terminal	+ terminal: black(-)	- terminal: red(+)
R(~) : red(+)	0.4 V ~ 0.7 V	-
S(~) : red(+)	0.4 V ~ 0.7 V	-
T(~) : red(+)	0.4 V ~ 0.7 V	-
R(~) : black(-)	-	0.4 V ~ 0.7 V
S(~) : black(-)	-	0.4 V ~ 0.7 V
T(~) : black(-)	-	0.4 V ~ 0.7 V

✻ 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 IPM Checking Method



1. Wait until inverter PCB DC voltage is discharged after main power off.
2. Pull out CN-P1, CN-N1 connectors and U,V,W COMP connector connected with the inverter 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 28K Ω ±10%.
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(+)	28K Ω ± 10%	Open
V terminal : red(+)	28K Ω ± 10%	Open
W terminal : red(+)	28K Ω ± 10%	Open
	P terminal : red(+)	**N terminal : red (+)**
U terminal : black(-)	Open	28K Ω ± 10%
V terminal : black(-)	Open	28K Ω ± 10%
W terminal : black(-)	Open	28K Ω ± 10%

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

2.5 Other

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

Caution **In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y turned off (wait 3 minutes after main power OFF), otherwise it may cause electrical shock.**

3. Self-diagnosis function

Error Indicator

- This function indicates type 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, low number of error code is first displayed.
- After error occurrence, if error is released, error LED is also released simultaneously.

Error display method

1st and 2nd LED of 7-segment refers to the error number and the 3rd LED refers to the outside unit number.
Ex) 011: Error No. 1 of outside unit No. 1
011➠051: Error No. 105 of outside unit No. 1

	Display number			Error item	Root cause of error
Indoor unit	0	1	-	Indoor unit air temperature sensor error	Indoor unit air temperature sensor disconnection or short circuit
	0	2	-	Indoor unit pipe inlet temperature sensor error	Indoor unit pipe inlet temperature sensor disconnection or short circuit
	0	3	-	Communication error between wired remote controller and indoor unit	Occurs when indoor unit communication signal is not received from the wired remote controller
	0	4	-	Indoor unit drain error	Drain pump and float switch error
	0	5	-	Communication error between outside unit and indoor unit	When the indoor unit does not receive the outside communication signal continuously for 5 minutes or more
	0	6	-	Indoor unit pipe outlet temperature sensor error	Indoor unit pipe outlet temperature sensor disconnection or short circuit
	0	7	-	Different mode operation	When operated in different operating mode than the one first operated
	0	9	-	Indoor unit EEPROM error	Communication error between MICOM and EEPROM or when there is no indoor unit EEPROM data
	1	0	-	Indoor unit BLDC motor feedback signal error	When motor connector is removed or defective
	1	1	-	Communication error between indoor unit/outside unit	When the communication is working but cannot be called from the outside unit (must be readdressed)
Outside unit	2	1	1	Master outside unit inverter compressor IPM fault	Master outside unit inverter compressor drive IPM error
	2	1	2	Slave outside unit inverter compressor IPM fault	Slave outside unit inverter compressor drive IPM error
	2	3	1	Master outside unit inverter compressor DC link under-voltage	DC voltage is not charged after master outside unit operating relay is turned on
	2	3	2	Slave outside unit inverter compressor DC link under-voltage	DC voltage is not charged after slave outside unit operating relay is turned on
	2	4	1	Master outside unit high pressure switch	Compressor maintenance by master outside unit high pressure switch
	2	4	2	Master outside unit high pressure switch	Compressor maintenance by slave outside unit high pressure switch
	2	5	1	Master outside unit input voltage over-voltage/under-voltage	Master outside unit input voltage of 487V or above or 270V or less
	2	5	2	Slave outside unit input voltage over-voltage/under-voltage	Slave outside unit input voltage of 487V or above or 270V or less
	2	6	1	Master outside unit inverter compressor operation failure error	Initial operation failure due to master outside unit inverter compressor error
	2	6	2	Slave outside unit inverter compressor operation failure error	Initial operation failure due to slave outside unit inverter compressor error
	2	8	1	Master outside unit inverter DC link over-voltage error	Compressor turned Off due to master outside unit inverter DC voltage over-charge

	Display number			Error item	Root cause of error
Outside unit	2	8	2	Slave outside unit inverter DC link over-voltage error	Compressor turned Off due to slave outside unit inverter DC voltage over-charge
	2	9	1	Master outside unit inverter compressor over-current	Master outside unit inverter compressor error or operating component (IPM) error operation
	2	9	2	Slave outside unit inverter compressor over-current	Slave outside unit inverter compressor error or operating component (IPM) error operation
	3	1	1	Master outside unit inverter CT under-current error	Compressor turned off due to master outside unit inverter CT under-current
	3	1	2	Slave outside unit inverter CT under-current error	Compressor turned off due to slave outside unit inverter CT under-current
	3	2	1	Master outside unit inverter compressor discharge temperature over-rise	Compressor turned off due to master outside unit inverter compressor discharge temperature over-rise
	3	2	2	Slave outside unit inverter compressor discharge temperature over-rise	Compressor turned off due to slave outside unit inverter compressor discharge temperature over-rise
	3	3	1	Master outside unit static speed compressor discharge temperature over-rise	Compressor turned off due to master outside unit static speed compressor discharge temperature over-rise
	3	3	2	Slave outside unit static speed compressor discharge temperature over-rise	Compressor turned off due to slave outside unit static speed compressor discharge temperature over-rise
	3	4	1	Master outside unit high pressure over-rise	Compressor turned off due to master outside unit high pressure over-rise
	3	4	2	Slave outside unit high pressure over-rise	Compressor turned off due to slave outside unit high pressure over-rise
	3	5	1	Master outside unit low pressure over-drop.	Compressor turned off due to master outside unit low pressure over-drop.
	3	5	2	Slave outside unit low pressure over-drop.	Compressor turned off due to slave outside unit low pressure over-drop.
	4	0	1	Master outside unit inverter compressor CT sensor error	Master outside unit inverter compressor current detection (CT) sensor disconnection or short circuit
	4	0	2	Slave outside unit inverter compressor CT sensor error	Slave outside unit inverter compressor current detection (CT) sensor disconnection or short circuit
	4	1	1	Master outside unit inverter compressor discharge temperature sensor error	Master outside unit inverter compressor discharge temperature sensor disconnection or short circuit
	4	1	2	Slave outside unit inverter compressor discharge temperature sensor error	Slave outside unit inverter compressor discharge temperature sensor disconnection or short circuit
	4	2	1	Master outside unit under-voltage sensor error	Master outside unit under-voltage sensor disconnection or short circuit
	4	2	2	Slave outside unit under-voltage sensor error	Slave outside unit under-voltage sensor disconnection or short circuit
	4	3	1	Master outside unit over-voltage sensor error	Master outside unit over-voltage sensor disconnection or short circuit
	4	3	2	Slave outside unit over-voltage sensor error	Slave outside unit over-voltage sensor disconnection or short circuit
	4	4	1	Master outside unit air temperature sensor error	Master outside unit air temperature sensor disconnection or short circuit
	4	4	2	Slave outside unit air temperature sensor error	Slave outside unit air temperature sensor disconnection or short circuit
	4	5	1	Master outside unit heat exchange temperature sensor (A) error	Master outside unit heat exchange temperature sensor (A) disconnection or short circuit
	4	5	2	Slave outside unit heat exchange temperature sensor (A) error	Slave outside unit heat exchange temperature sensor (A) disconnection or short circuit
	4	6	1	Master outside unit suction temperature sensor error	Master outside unit suction temperature sensor disconnection or short circuit
	4	6	2	Slave outside unit suction temperature sensor error	Slave outside unit suction temperature sensor disconnection or short circuit
	4	7	1	Master outside unit static speed compressor discharge temperature sensor error	Master outside unit static speed compressor discharge temperature sensor disconnection or short circuit
	4	7	2	Slave outside unit static speed compressor discharge temperature sensor error	Slave outside unit static speed compressor discharge temperature sensor disconnection or short circuit

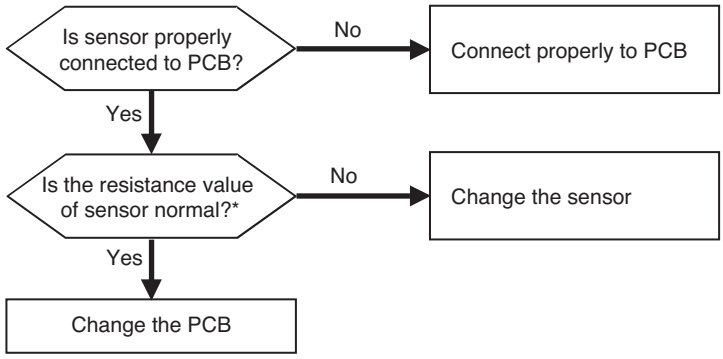
	Display number				Error item	Root cause of error
Outside unit	4	8	1		Master outside unit static speed compressor discharge temperature sensor error	Master outside unit static speed compressor discharge temperature sensor disconnection or short circuit
	4	8	2		Slave outside unit static speed compressor discharge temperature sensor error	Slave outside unit static speed compressor discharge temperature sensor disconnection or short circuit
	5	0	1		Master outside unit 3 phase power missing	Master outside unit power line phase missing
	5	0	2		Slave outside unit 3 phase power missing	Slave 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	1		Communication error with master outside unit inverter controller	When the inverter controller signal is not received from the master outside unit inverter controller
	5	2	2		Communication error with slave outside unit inverter controller	When the inverter controller signal is not received from the slave outside unit inverter controller
	5	3	-		Communication error with master outside unit controller and indoor unit	When the indoor unit control signal is not received from the master outside unit controller
	5	4	1		Master outside unit 3 phase power reverse phase	Master outside unit 3 phase power reverse phase connection
	5	4	2		Slave outside unit 3 phase power reverse phase	Slave outside unit 3 phase power reverse phase connection
	6	0	1		Master outside unit inverter PCB EEPROM error	Master outside unit inverter PCB EEPROM ACCESS error
	6	0	2		Slave outside unit inverter PCB EEPROM error	Slave outside unit inverter PCB EEPROM ACCESS error
	7	0	1		Master outside unit static speed CT sensor error	Master outside unit static speed CT sensor disconnection or short circuit
	7	0	2		Slave outside unit static speed CT sensor error	Slave outside unit static speed CT sensor disconnection or short circuit
	7	3	1		Master outside unit inverter PCB input instant over-current (Peak)	Master outside unit inverter PCB input instant over-current (Peak) exceeded
	7	3	2		Slave outside unit inverter PCB input instant over-current (Peak)	Slave outside unit inverter PCB input instant over-current (Peak) exceeded
	7	4	1		Master outside unit inverter PCB phase imbalance	When the master outside unit inverter PCB input current is different
	7	4	2		Slave outside unit inverter PCB phase imbalance	When the slave outside unit inverter PCB input current is different
	8	6	1		Master outside unit master PCB EEPROM error	Communication error between master outside unit master MICOM and EEPROM or EEPROM missing
	8	6	2		Slave outside unit master PCB EEPROM error	Communication error between slave outside unit master MICOM and EEPROM or EEPROM missing
	1	0	4	1	Communication error between master outside unit and outside unit	When signal from slave outside unit is not received from master outside unit master MICOM
	1	0	4	2	Communication error between slave outside unit and outside unit	When signal from slave outside unit is not received from slave outside unit master MICOM
	1	1	3	1	Master outside unit liquid pipe temperature sensor error	Master outside unit liquid pipe temperature sensor disconnection or short circuit
	1	1	3	2	Slave outside unit liquid pipe temperature sensor error	Slave outside unit liquid pipe temperature sensor disconnection or short circuit
	1	1	4	1	Master outside unit over-cooling inlet temperature sensor error	Master outside unit over-cooling inlet temperature sensor disconnection or short circuit
	1	1	4	2	Slave outside unit over-cooling inlet temperature sensor error	Slave outside unit over-cooling inlet temperature sensor disconnection or short circuit
	1	1	5	1	Master outside unit over-cooling outlet temperature sensor error	Master outside unit over-cooling outlet temperature sensor disconnection or short circuit
	1	1	5	2	Slave outside unit over-cooling outlet temperature sensor error	Slave outside unit over-cooling outlet temperature sensor disconnection or short circuit

	Display number				Error item	Root cause of error
Outside unit	1	5	1	-	Outside unit 4 way valve switch failure	Outside unit 4 way valve switch error
	1	7	3	1	Master outside unit static speed compressor error	Master outside unit static speed compressor burn, locking and over-current
	1	7	3	2	Slave outside unit static speed compressor error	Slave outside unit static speed compressor burn, locking and over-current
	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	Communication error between main MICOM and sub MICOM

■ **Refer to the troubleshooting guide of service technical manual for each error.**

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

■ Error diagnosis and countermeasure flow chart



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

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

CN-ROOM : Indoor air temp sensor

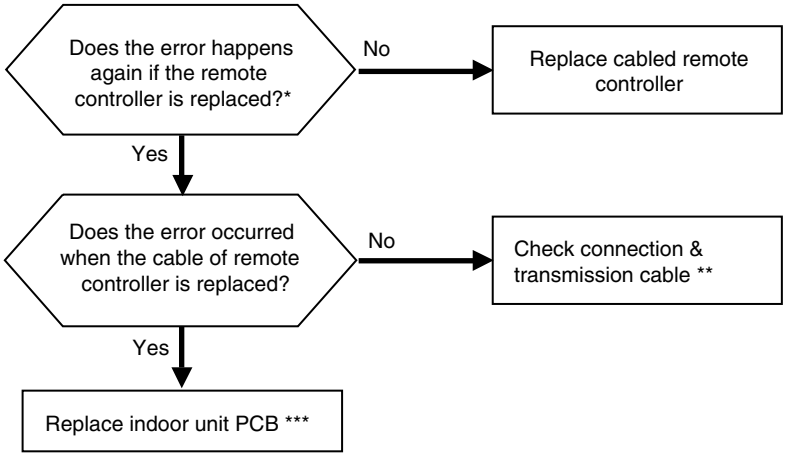
CN-PIPE2 : Pipe outlet temp sensor

CN-PIPE1 : Pipe inlet temp sensor

Measure the resistance of outlet pipe temp sensor.

Error No.	Error Type	Error Point	Main Reasons
03	No transmission 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. transmission cable problem

■ Error diagnosis and countermeasure flow chart



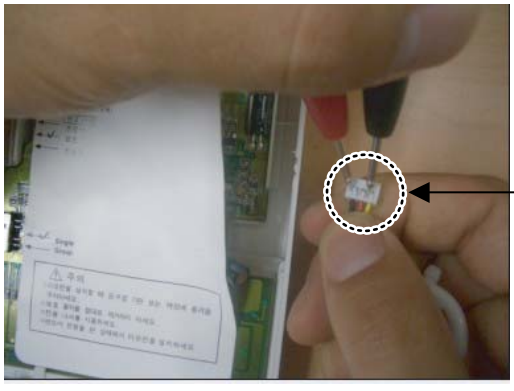
* If there is no remote controller to replace : Use another unit's remote controller doing well

** 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

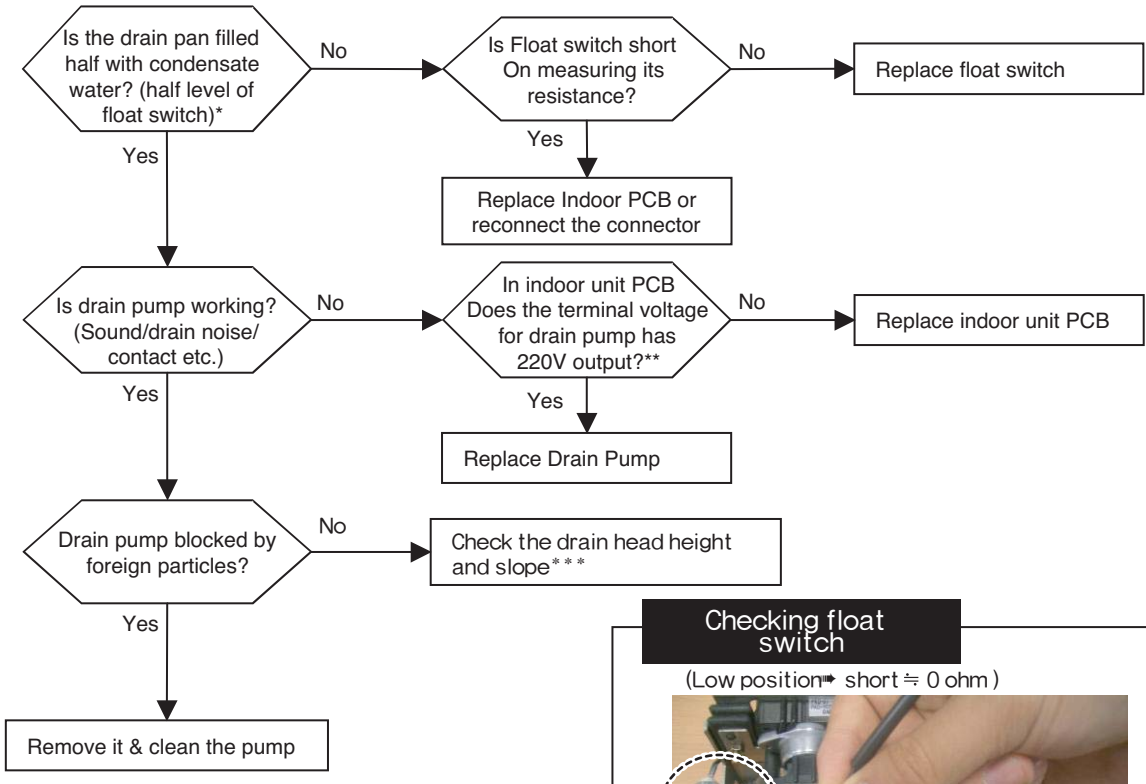
※ The PCB can differ from model to model.
Check from the right source.



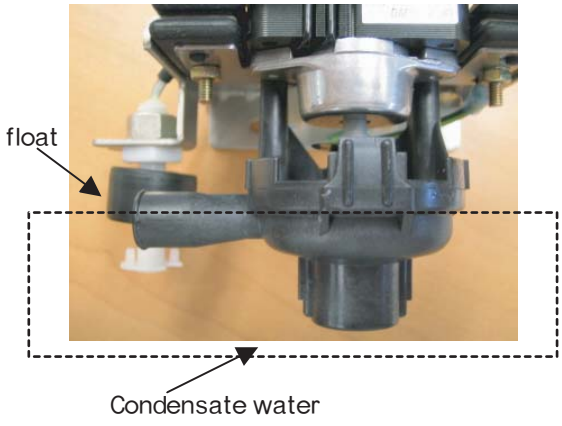
Checking transmission cable connection status

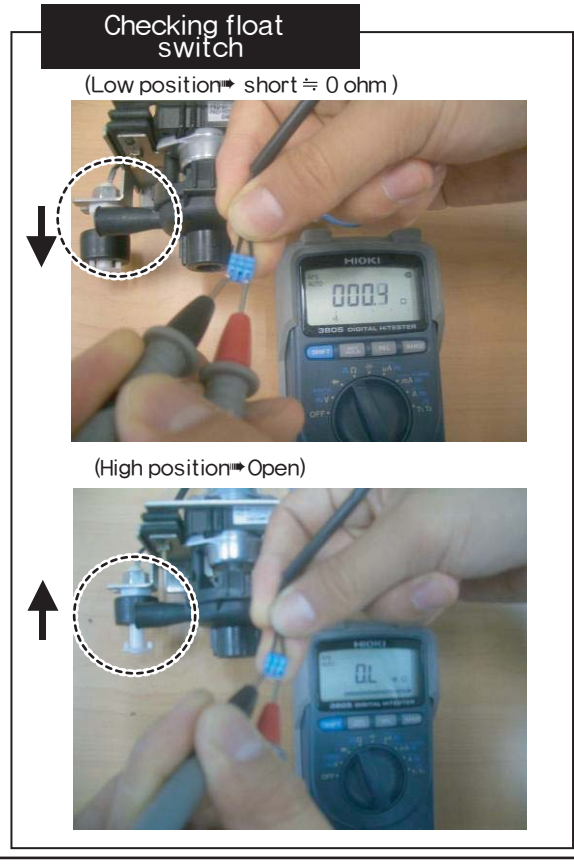
Error No.	Error Type	Error Point	Main Reasons
04	Drain pump error	Float switch is open due to rising of condensate water level because of drain pump fault or drain pipe clogging	1. Drain pump/float switch fault 2. Improper drain pipe location, clogging of drain pipe 3. Indoor unit PCB fault

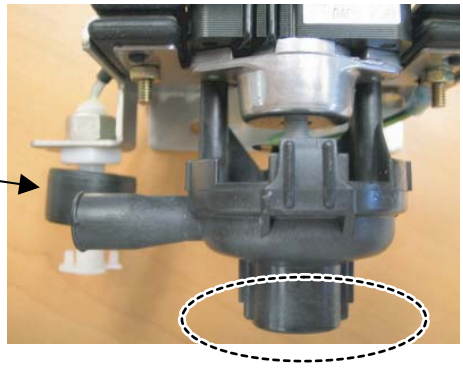
■ Error diagnosis and countermeasure flow chart



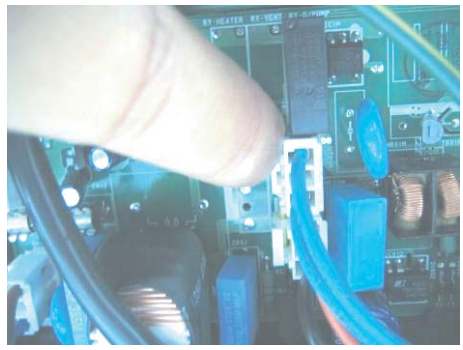
* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.







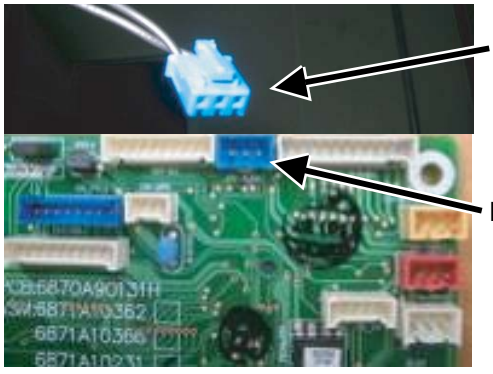
A:Point to check rotating



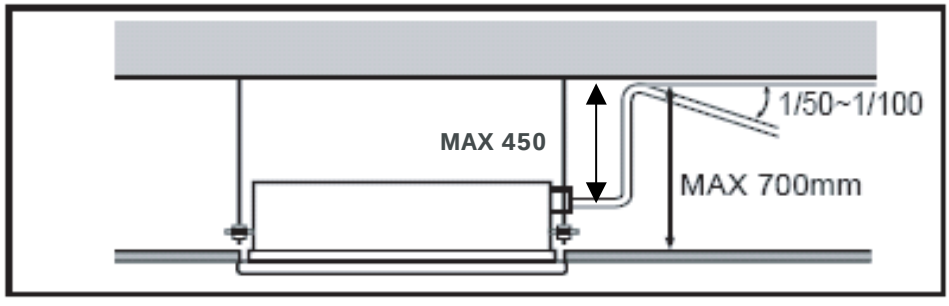
*** Indoor PCB drain pump connector

(Check input of 220V)

(Marked as **CN-DPUMP)**

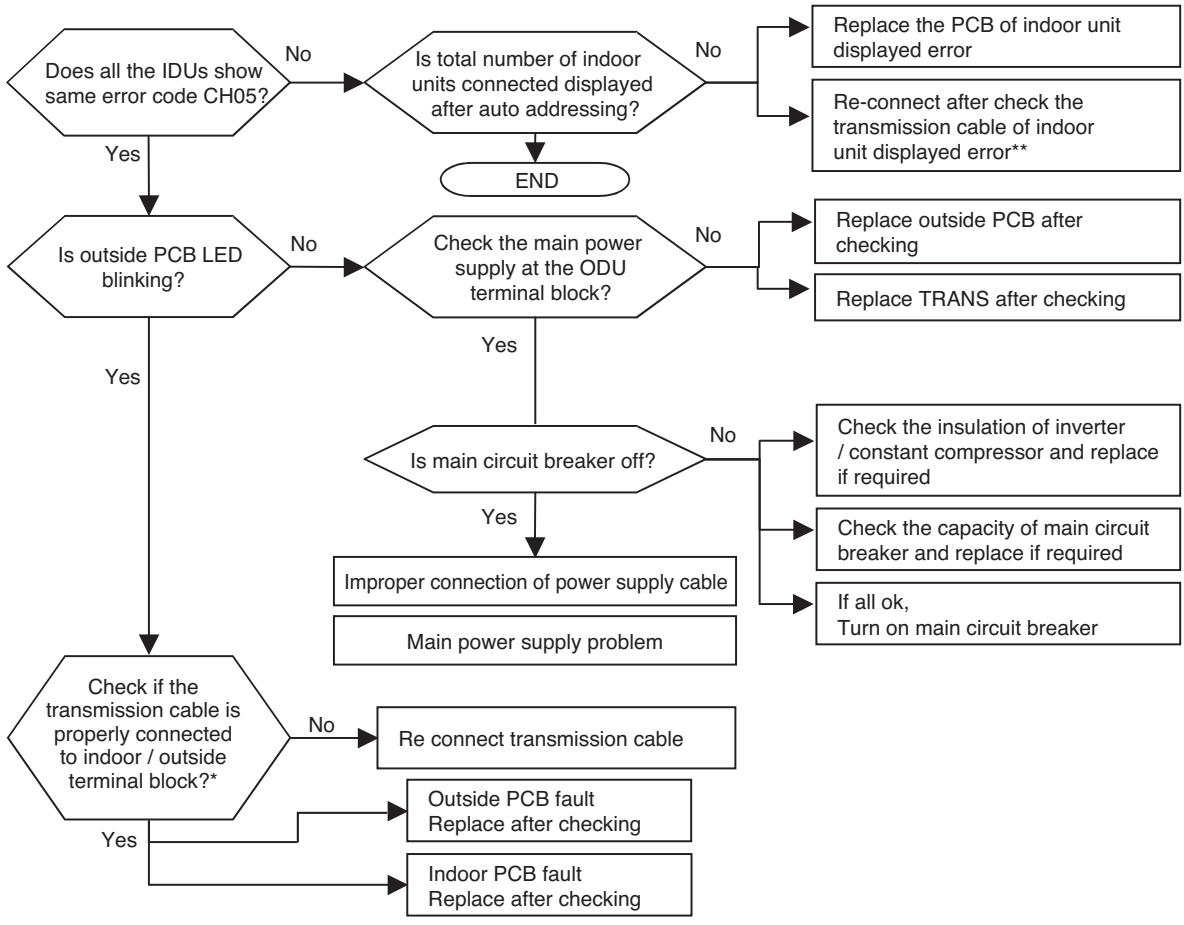


[***] Standard of drain pipe head height / slope



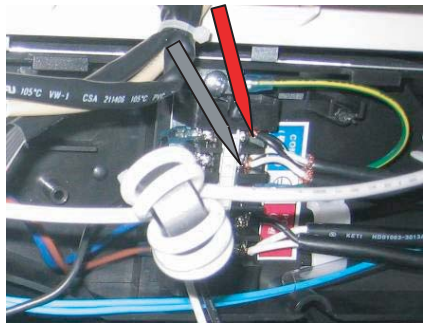
Error No.	Error Type	Error Point	Main Reasons
05	Indoor & Outside unit transmission error	No signal transmission between indoor & outside units.	1. Auto addressing is not done 2. transmission cable is not connected 3. Short circuit of transmission cable 4. Indoor unit transmission circuit fault 5. Outside unit transmission circuit fault 6. Not enough distance between power and transmission cable?

■ Error diagnosis and countermeasure flow chart



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

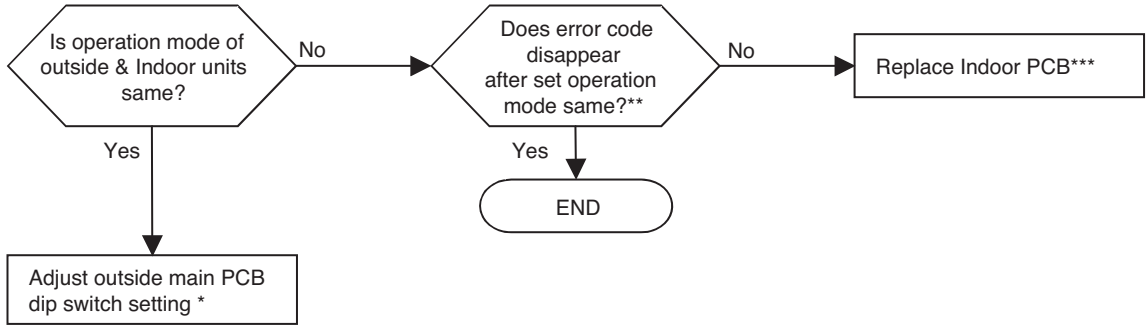
* If the DC voltage between transmission terminal A, B of indoor unit is fluctuate within (-9V~+9V) then transmission from outside unit is normal



Error No.	Error Type	Error Point	Main Reasons
06	Indoor unit outlet pipe temperature sensor error	Indoor unit outlet pipe temperature sensor open or short	Refer to CH02

Error No.	Error Type	Error Point	Main Reasons
07	All Indoor units are not running in same mode	The Indoor units started later are operated in different mode from earlier one.	1. Indoor units are in different mode 2. PCB fault 3. cabled remote controller fault ※ Checking ch07 method IDU doesn't operate as Operation mode is flickering at IDU wired remote controller and IDU display window.

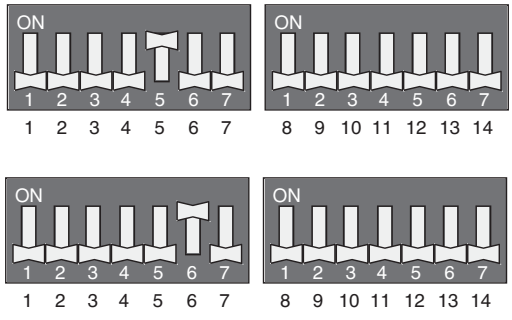
■ Error diagnosis and countermeasure flow chart



* Check mode selection setting of wired remote controller.

** Outside main PCB dip switch no.5 (Cooling) or no.6 (heating) is in On, different mode operation error may occur because the operation mode is fixed by dip switch setting.

♦ Dip switch Setting ♦



*** Dissolution method CH07 with remote controller

1) Error removal method : Turn off remote controller by pressing the On/Off button on the cabled remote controller. The error code will be removed automatically after few seconds.
With cableless remote controller: Turn off indoor unit, and then turn on by changing the operation mode. The error will disappear.

**** After replacing the indoor unit PCB, make sure to be done to do Auto addressing and input the address of central control

***** If ODU Dry Contact function is set , different mode operation error may be occurred because the operation mode is fixed.

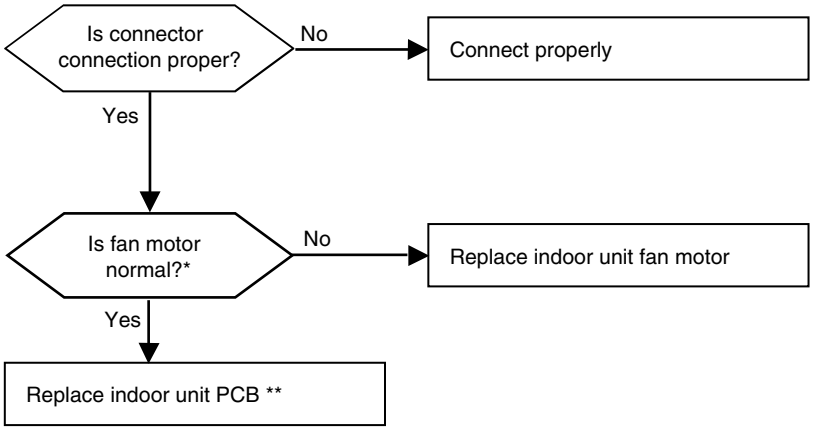
Error No.	Error Type	Error Point	Main Reasons
09	Indoor unit EEPROM error		1. Error developed in transmission between the micro- processor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage

■ Error diagnosis and countermeasure flow chart

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

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

■ Error diagnosis and countermeasure flow chart

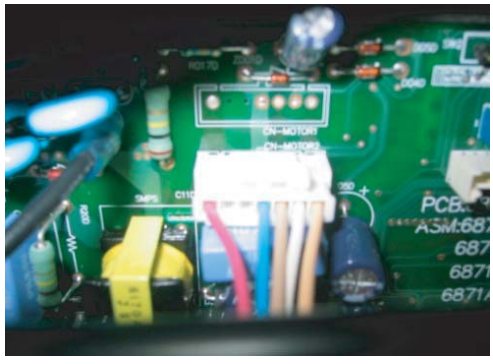


* It is normal when check hall sensor of indoor fan motor as shown below

Each termainl with the tester

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

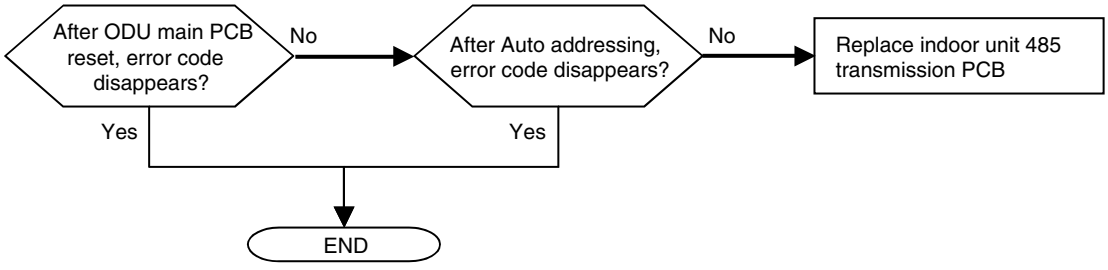
<Checking connection state of fan motor connector>



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

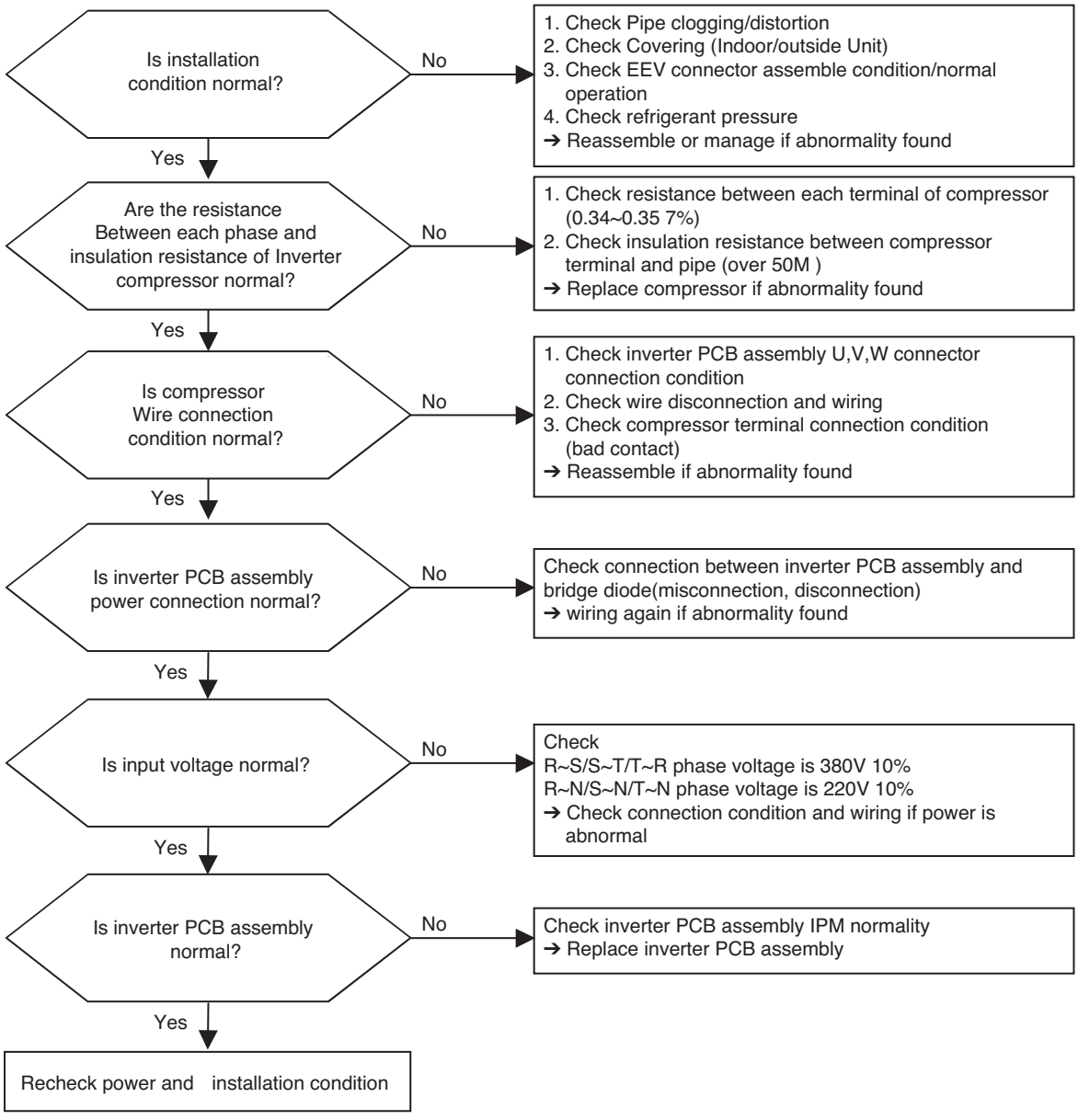
Error No.	Error Type	Error Point	Main Reasons
11	Indoor unit transmission error	Indoor unit doesn't get signal from ODU for 3 minutes continuously	1. Indoor 485 transmission PCB fault 2. After PCB replacing, auto addressing was not done

■ Error diagnosis and countermeasure flow chart



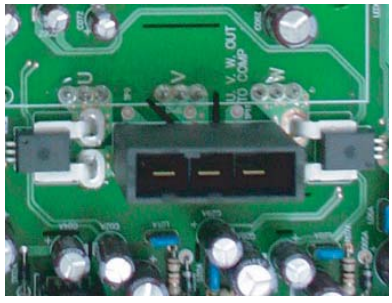
Error No.	Error Type	Error Point	Main Reasons
22* Master 221 Slave1 222	AC Input Current Over Error	Inverter PCB Assembly input 3 phase power current is over limited value(22A)	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage)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

■ Error Diagnosis and Countermeasure Flow Chart

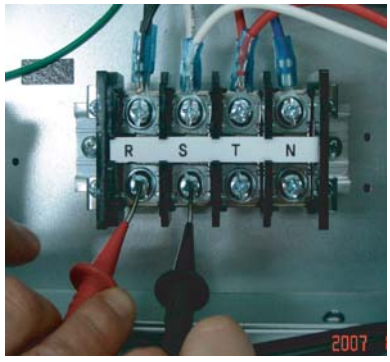


* Measuring resistance between each terminal of compressor

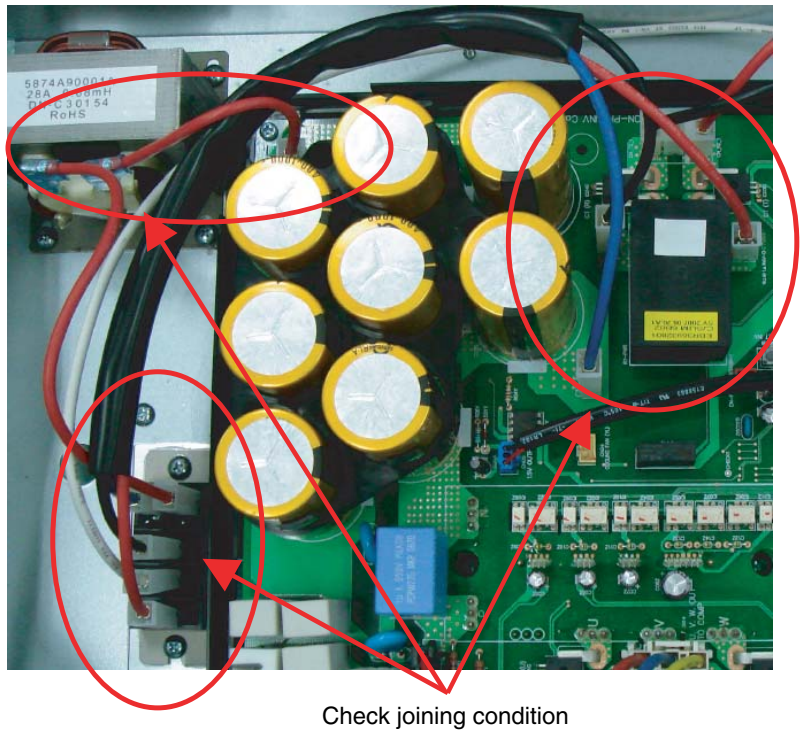
* Compressor wire connector connection



* Measuring input voltage



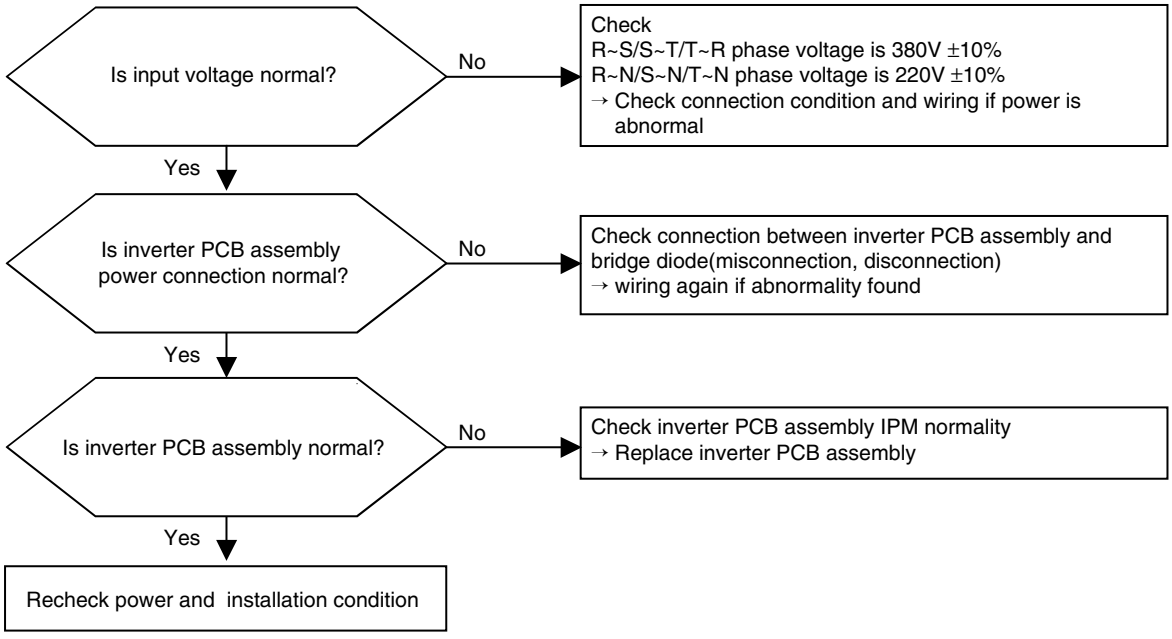
* Inverter PCB & bridge diode wiring



Check joining condition

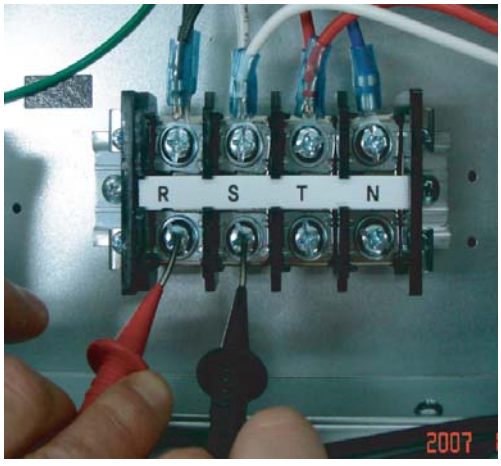
Error No.	Error Type	Error Point	Main Reasons
23* Master 231 Slave1 232	Inverter Compressor DC Link Low Voltage	DC Voltage isn't charged after starting relay on	1. DC Link terminal misconnection/terminal contact fault 2. Starting relay damage 3. Condenser damage 4. Inverter PCB assembly damage (DC Link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

■ Error Diagnosis and Countermeasure Flow Chart



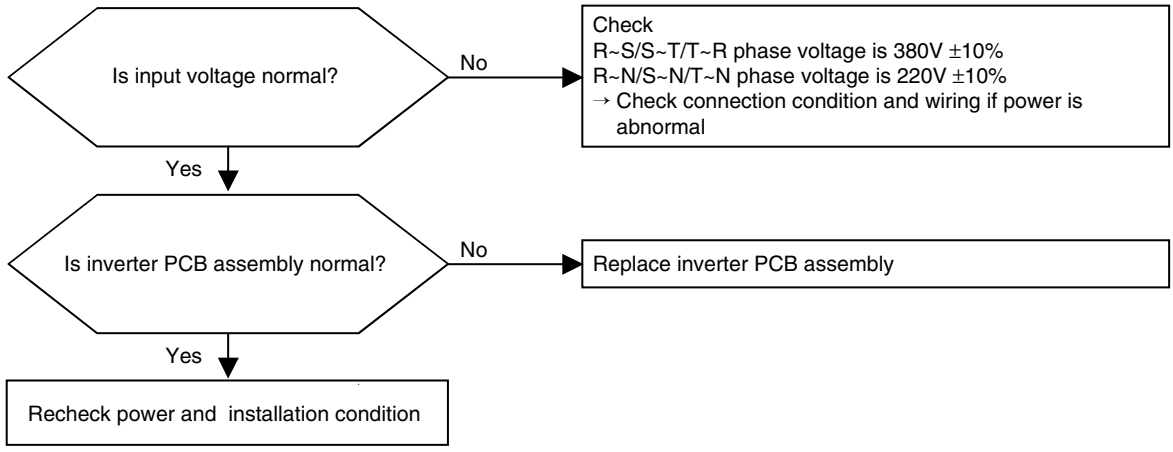
* Inverter PCB & bridge diode wiring

* Measuring input voltage

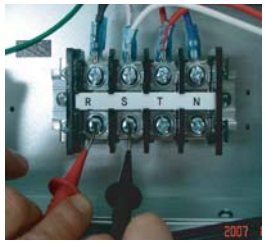


Error No.	Error Type	Error Point	Main Reasons
25* Master 251 Slave1 252	Input Voltage high/low	Input voltage is over limited value of the product (173V or less, 289V or more)	1. Input voltage abnormal (T-N) 2. Outside unit inverter PCB assembly damage (input voltage sensing part)

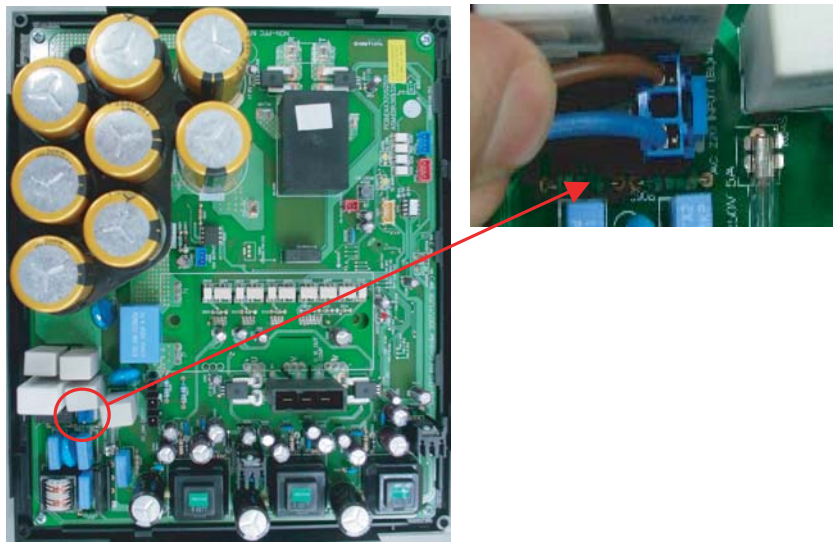
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring input voltage

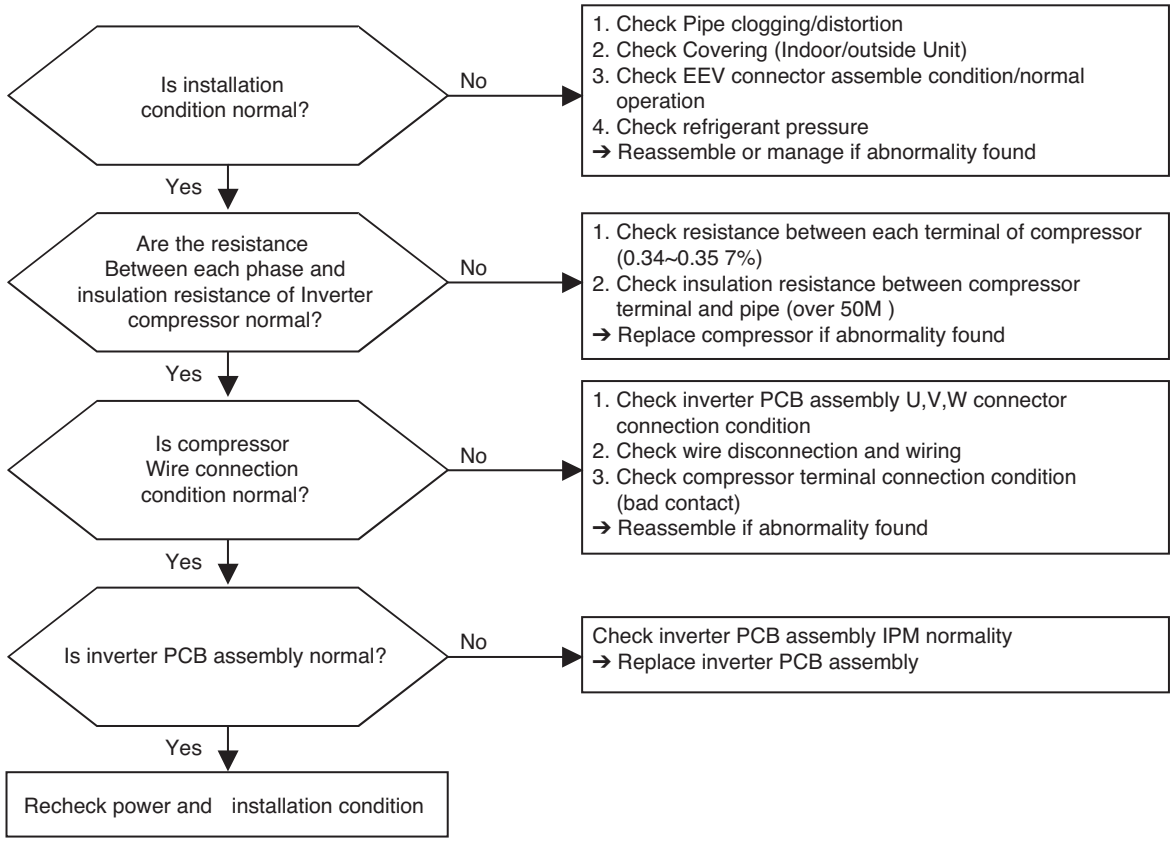


* Inverter PCB assembly power wiring



Error No.	Error Type	Error Point	Main Reasons
26* Master 261 Slave1 262	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 inverter PCB damage (CT)

■ Error Diagnosis and Countermeasure Flow Chart

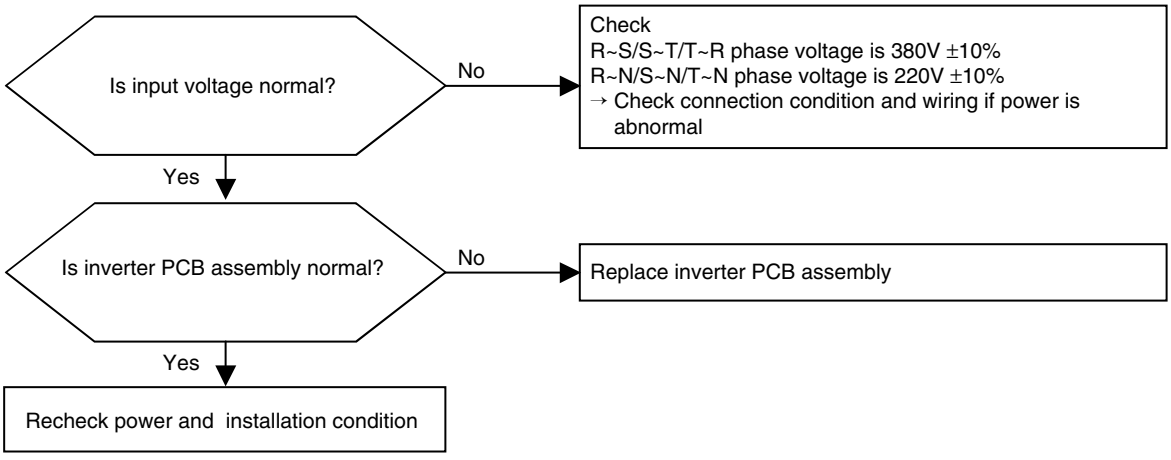


* Measuring resistance between each terminal of compressor

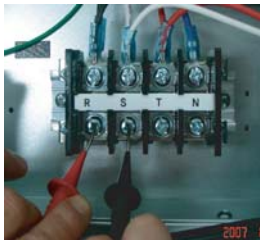
* Compressor wire connection

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

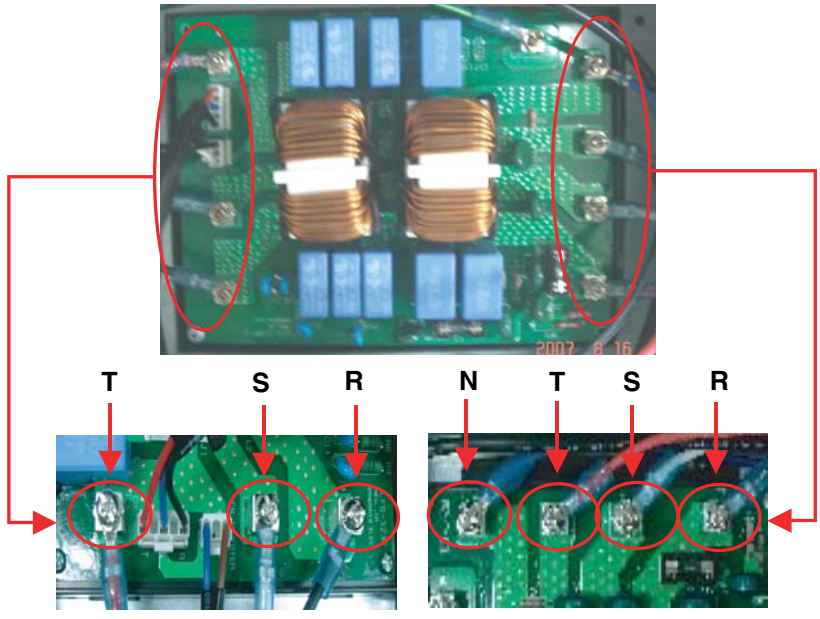
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring input voltage



* Noise filter wiring

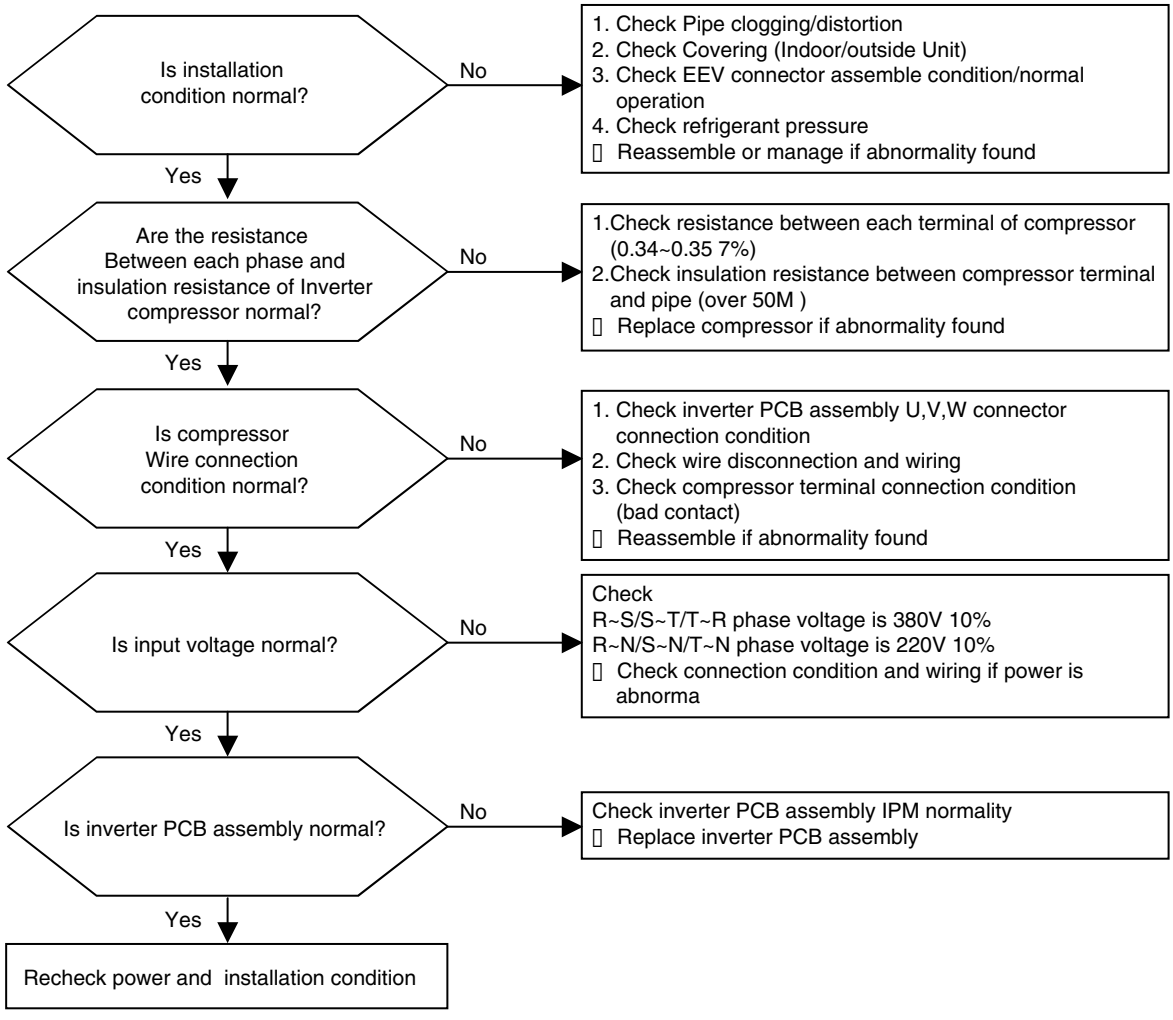


Noise filter output(lower part)

Noise filter input (upper part)

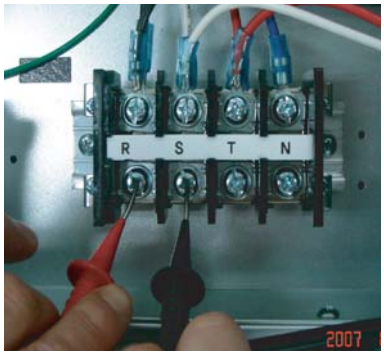
Error No.	Error Type	Error Point	Main Reasons
29* Master 291 Slave1 292	Inverter compressor over current	Inverter compressor input current is over 30A	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4.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

■ Error Diagnosis and Countermeasure Flow Chart



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

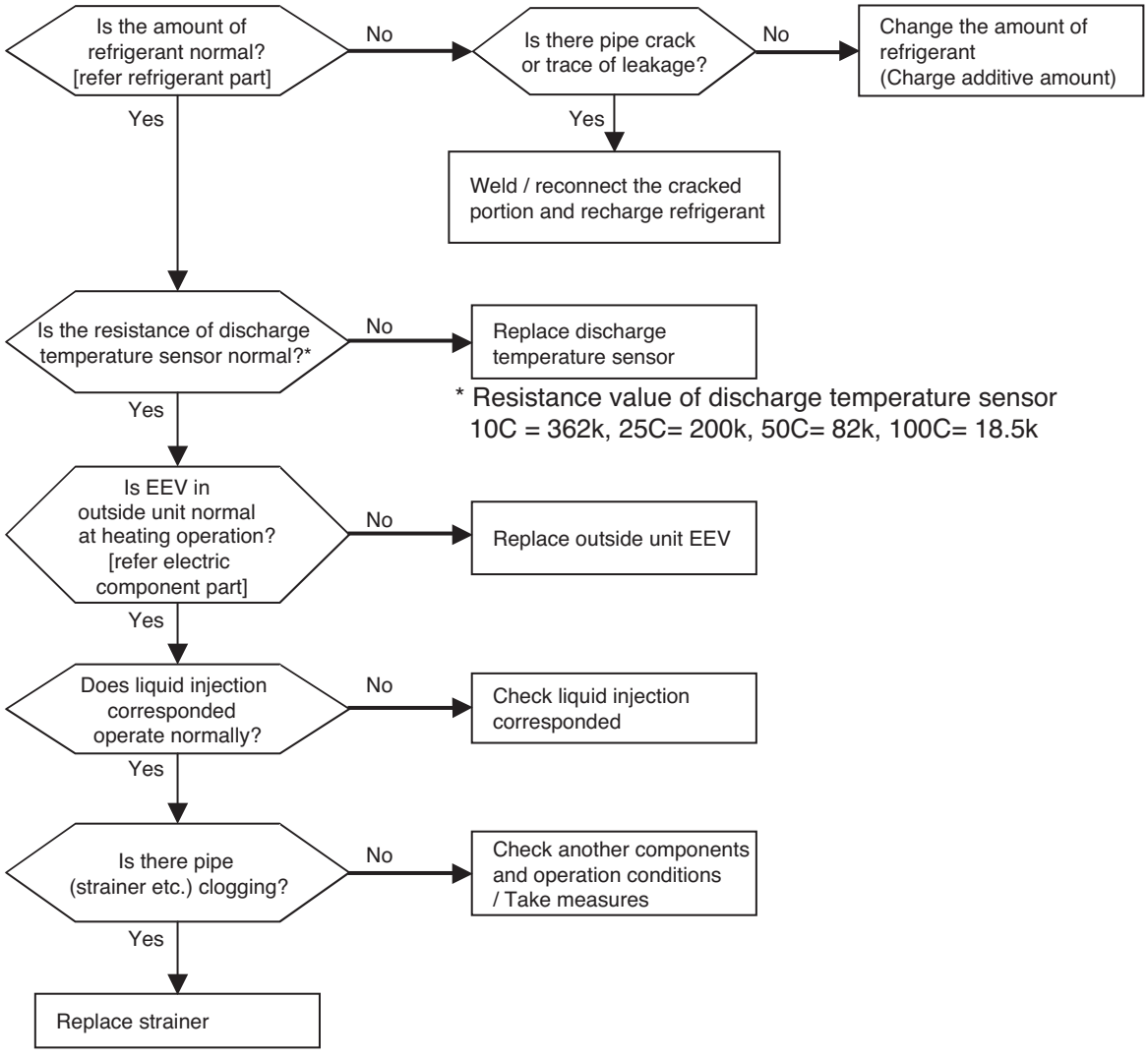
*** Measuring input voltage**



*** Compressor wire connection**

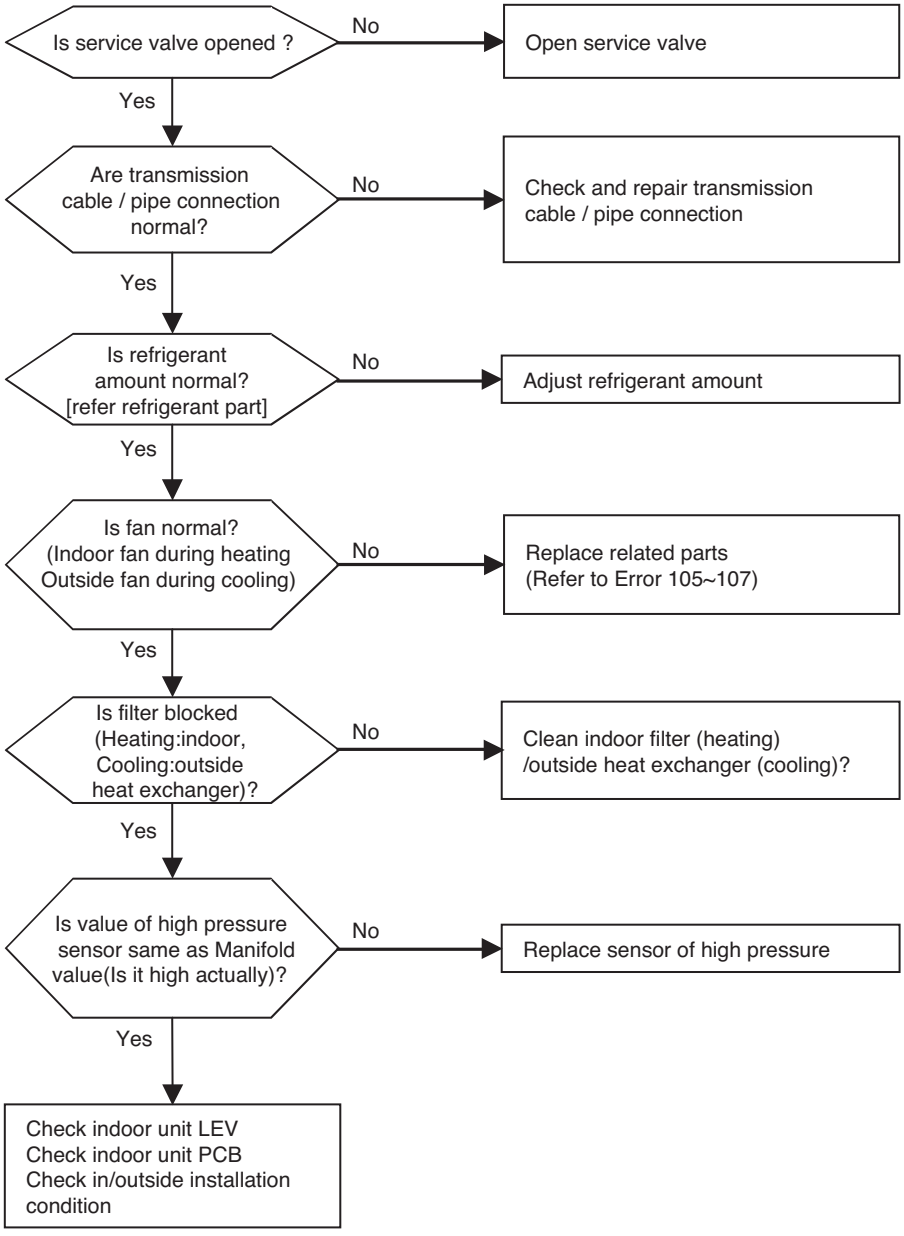
Error No.	Error Type	Error Point	Main Reasons
32* Master 321 Slave1 322	Over-increase discharge temperature of inverter compressor at main outside unit	Compressor is off because of over-increase discharge temperature of inverter compressor	1. Temperature sensor defect of inverter compressor discharge pipe 2. Refrigerant shortage / leak 3. EEV defect 4. Liquid injection valve defect
33* Master 331 Slave1 332	Over-increase discharge temperature of constant compressor at main constant outside and sub constant outside unit	Compressor is off because of over-increase discharge temperature of constant compressor at main and sub outside unit	1. Temperature sensor defect of constant compressor discharge pipe? 2. Refrigerant shortage/leak 3. EEV defect 4. Liquid injection valve defect

■ Error diagnosis and countermeasure flow chart



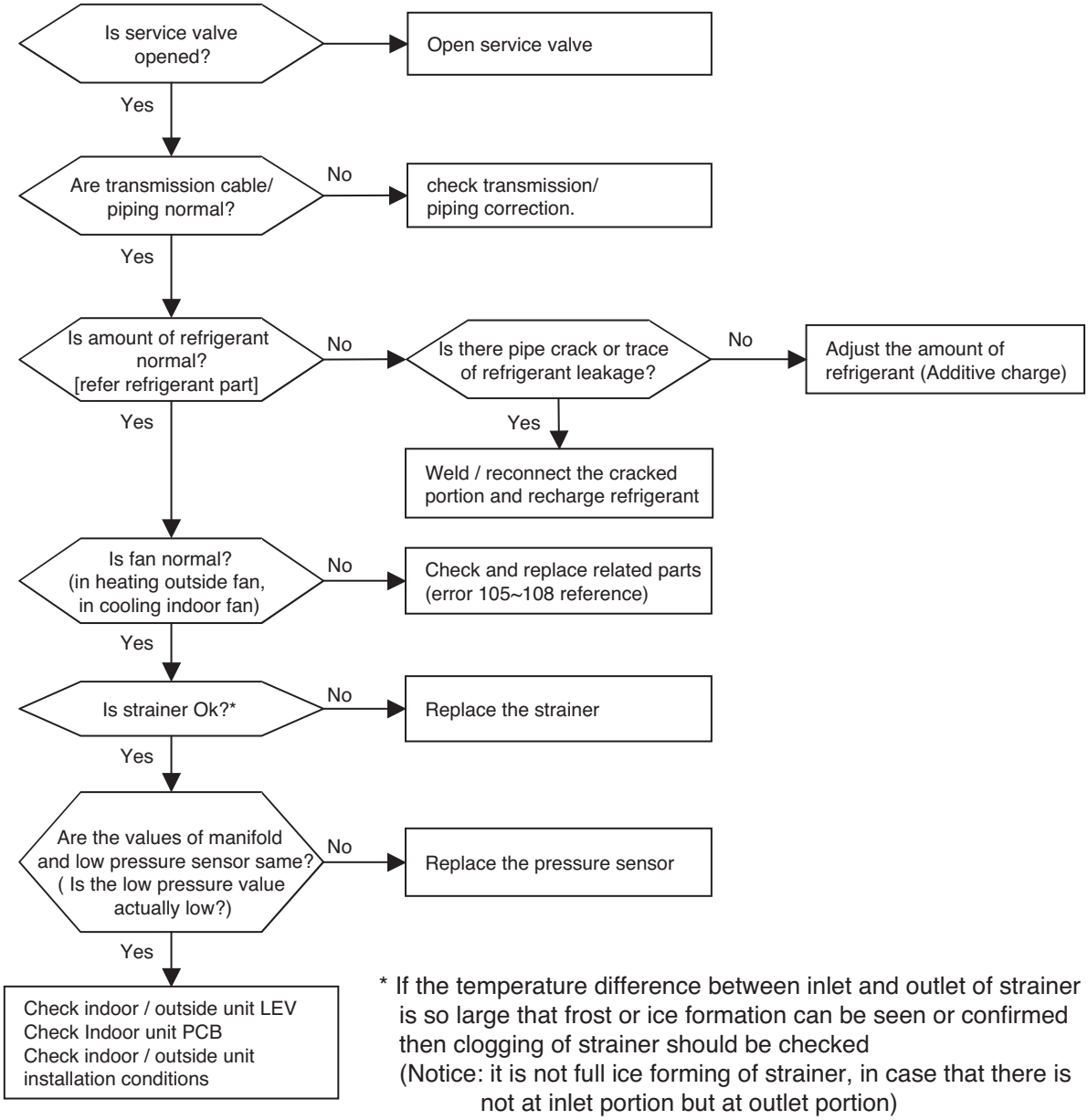
Error No.	Error Type	Error Point	Main Reasons
34* Master 341 Slave1 342	Over-increase of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to over-increase of high pressure by high pressure sensor	1. Defect of high pressure sensor 2. Defect of indoor or outside unit fan 3. Deformation because of damage of refrigerant pipe 4. Over-charged refrigerant 5. Defective indoor / outside unit EEV 6. When blocked - Outside unit is blocked during cooling - Indoor unit filter is blocked during heating 7. SVC valve is clogged 8. PCB defect of outside 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	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 outside/indoor unit fan 3. Refrigerant shortage/leakage 4. Deformation because of damage of refrigerant pipe 5. Defective indoor / outside unit EEV 6. Covering / clogging (outside unit covering during the cooling mode/ indoor unit filter clogging during heating mode) 7. SVC valve clogging 8. Defective outside unit PCB 9. Defective indoor unit pipe sensor

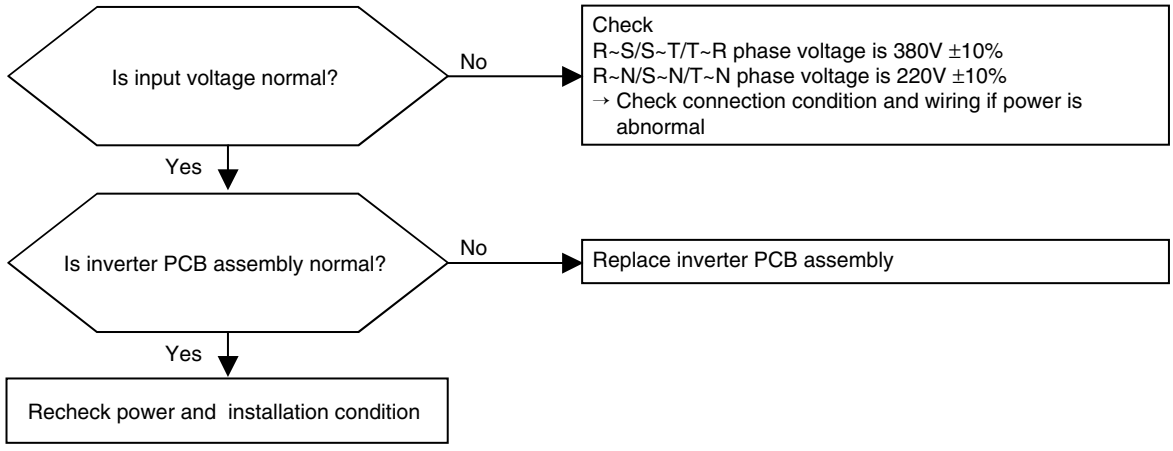
■ Error diagnosis and countermeasure flow chart



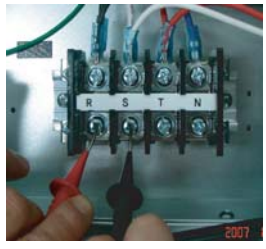
* If the temperature difference between inlet and outlet of strainer is so large that frost or ice formation can be seen or confirmed then clogging of strainer should be checked
(Notice: it is not full ice forming of strainer, in case that there is not at inlet portion but at outlet portion)

Error No.	Error Type	Error Point	Main Reasons
40* Master 401 Slave1 402	Inverter compressor CT sensor error	Micom input voltage isn't within 2.5V ±0.3V at initial state of power supply	1. Input voltage abnormal (T-N) 2. ODU inverter PCB damage (CT sensing part)

■ Error Diagnosis and Countermeasure Flow Chart

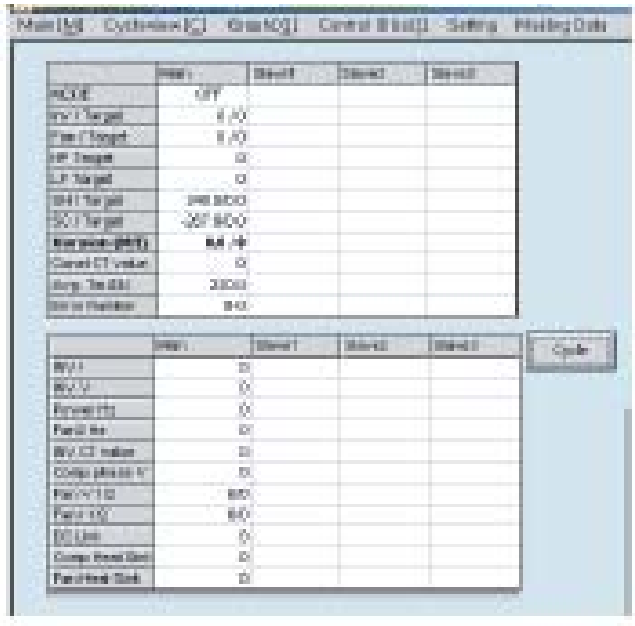


* Measuring input voltage



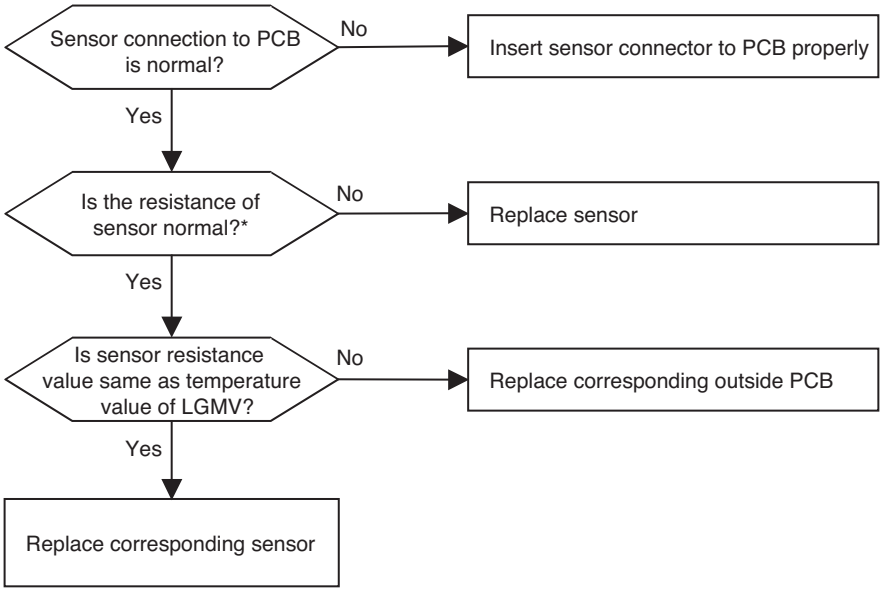
* Inverter PCB assembly

* LGMV Part



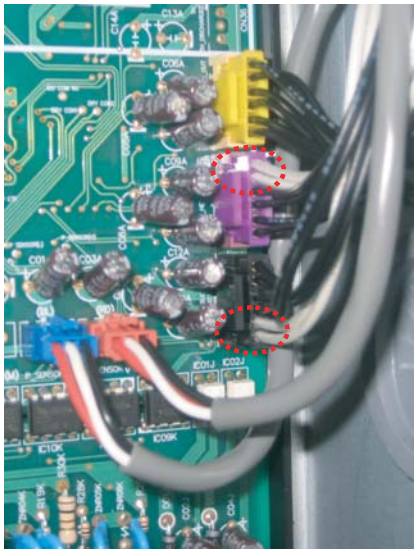
Error No.	Error Type	Error Point	Main Reasons
41* (Inverter) Master 411 Slave1 412 47* (Constant) Master 471 Slave1 472	Compressor discharge pipe temperature sensor error	Sensor measurement valve is abnormal (Open/Short)	1. Defective connection of the compressor discharge pipe temperature sensor 2. Defective discharge pipe compressor sensor of the compressor (open/short) 3. Defective outside PCB

■ Error diagnosis and countermeasure flow chart

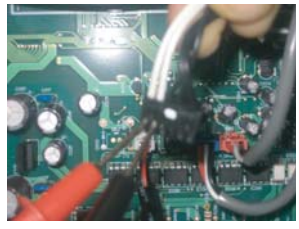


* Error is generated if the resistance is more than 5M(open) and less than 2k (short)

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



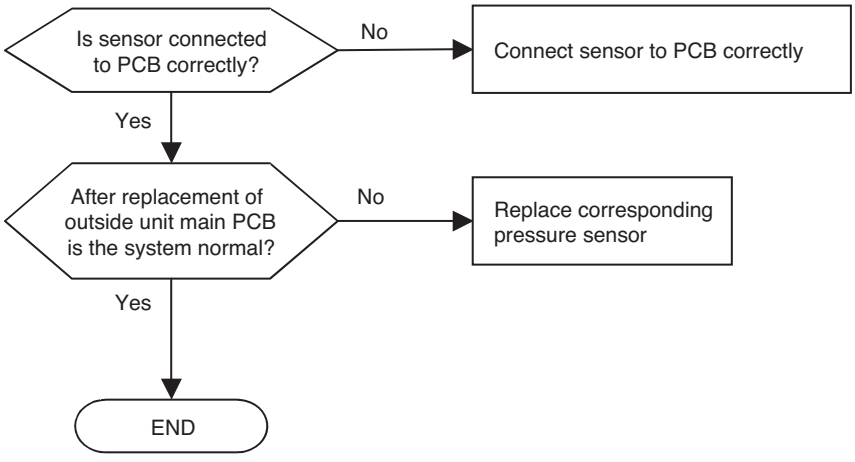
Check the resistance inverter compressor discharge temperature sensor

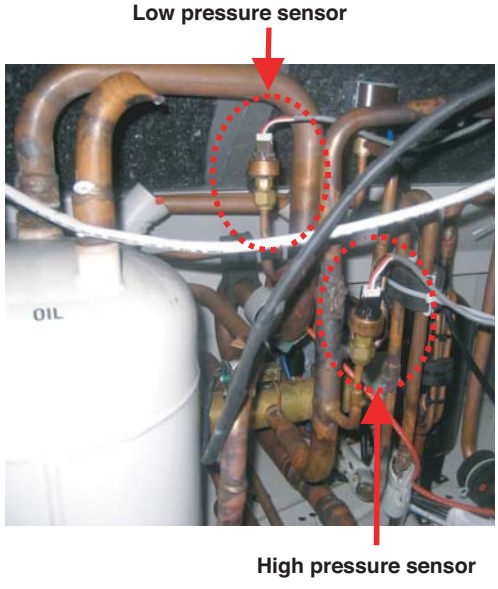


Check the resistance of constant compressor discharge temperature sensor

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 outside PCB
43* Master 431 Slave1 432	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 outside PCB

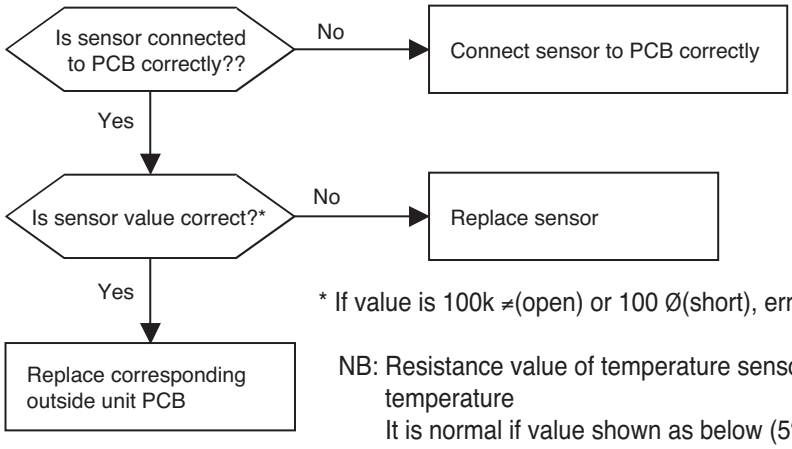
■ Error diagnosis and countermeasure flow chart





Error No.	Error Type	Error Point	Main Reasons
44* Master 441 Slave1 442	Sensor error of outside 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 outside PCB
45* Master 451 Slave1 452 48* Master 481 Slave1 482	Piping temperature sensor error of heat exchanger in master & slave outside unit heat exchanger (A,B)	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outside PCB
46* Master 461 Slave1 462	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 outside PCB

■ Error diagnosis and countermeasure flow chart



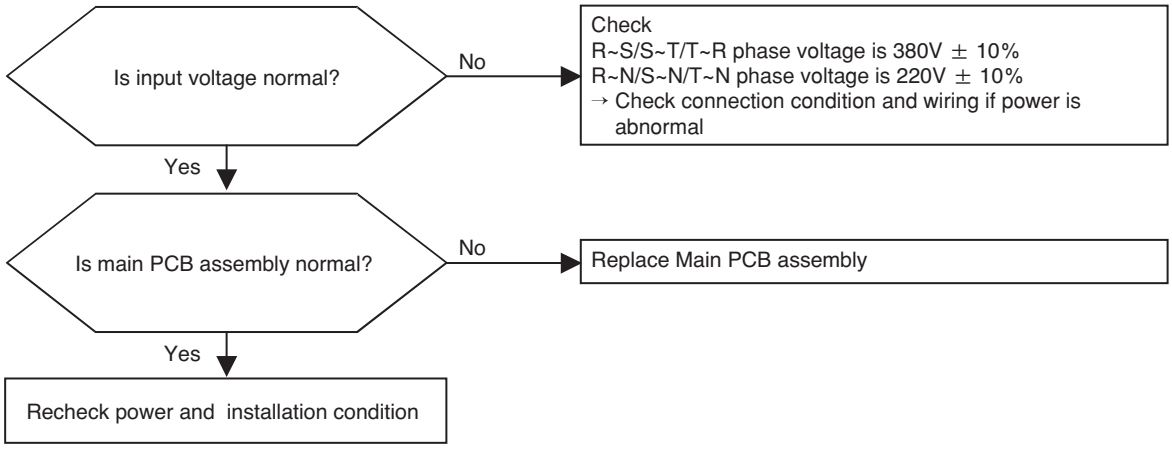
* If value is 100k ≠(open) or 100 Ø(short), error occurs

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

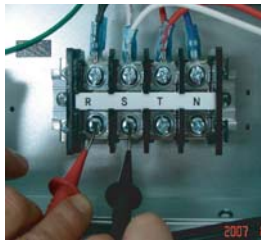
Error No.	Error Type	Error Point	Main Reasons
47* Master 471 Slave1 472	Discharge piping temperature sensor error of constant compressor	Abnormal value of sensor (Open/Short)	Refer to CH41
48* Master 481 Slave1 482	Piping temperature sensor error of heat Exchanger in master & slave outside unit heat exchanger (B)	Abnormal value of sensor (Open/Short)	Refer to CH45

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

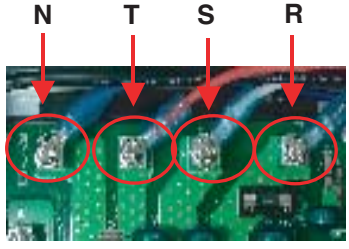
■ Error Diagnosis and Countermeasure Flow Chart

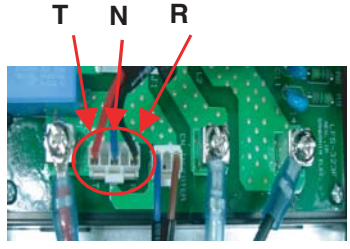


* Measuring input voltage

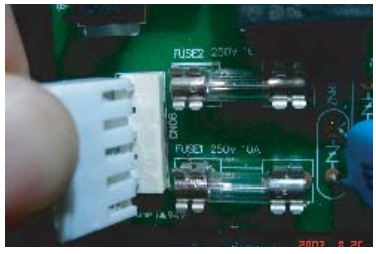


* Noise filter wiring



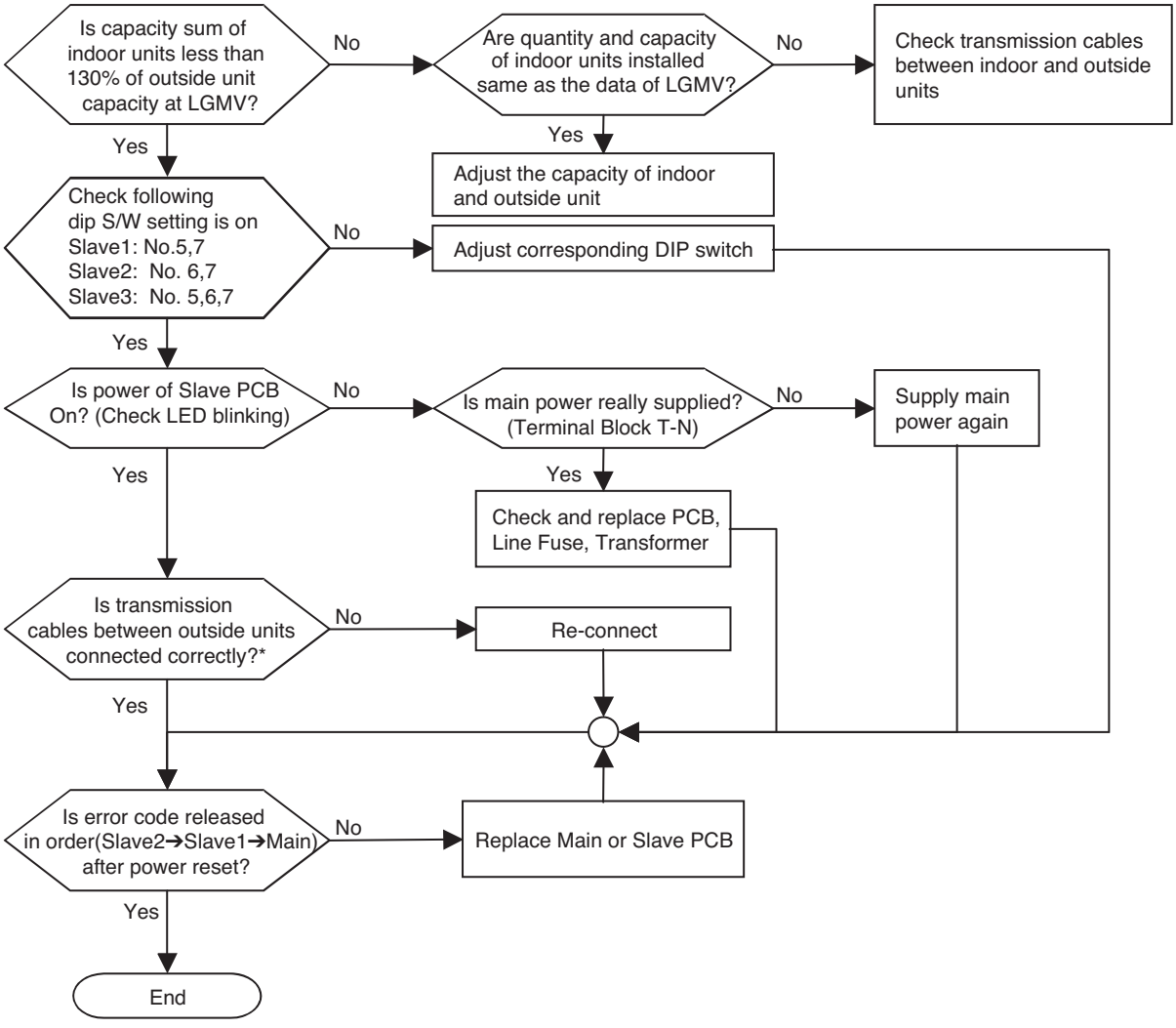


* Main PCB power connection



Error No.	Error Type	Error Point	Main Reasons
51	Over-Capacity (Sum of indoor unit capacity is more than outside capacity)	Sum of indoor unit capacity exceed outside unit capacity specification	1. 130% more than outside unit rated capacity 2. Wrong connection of transmission cable/piping 3. Control error of slave outside unit Dip switch 4. Power supply defect of slave unit PCB 5. Defect of outside unit PCB

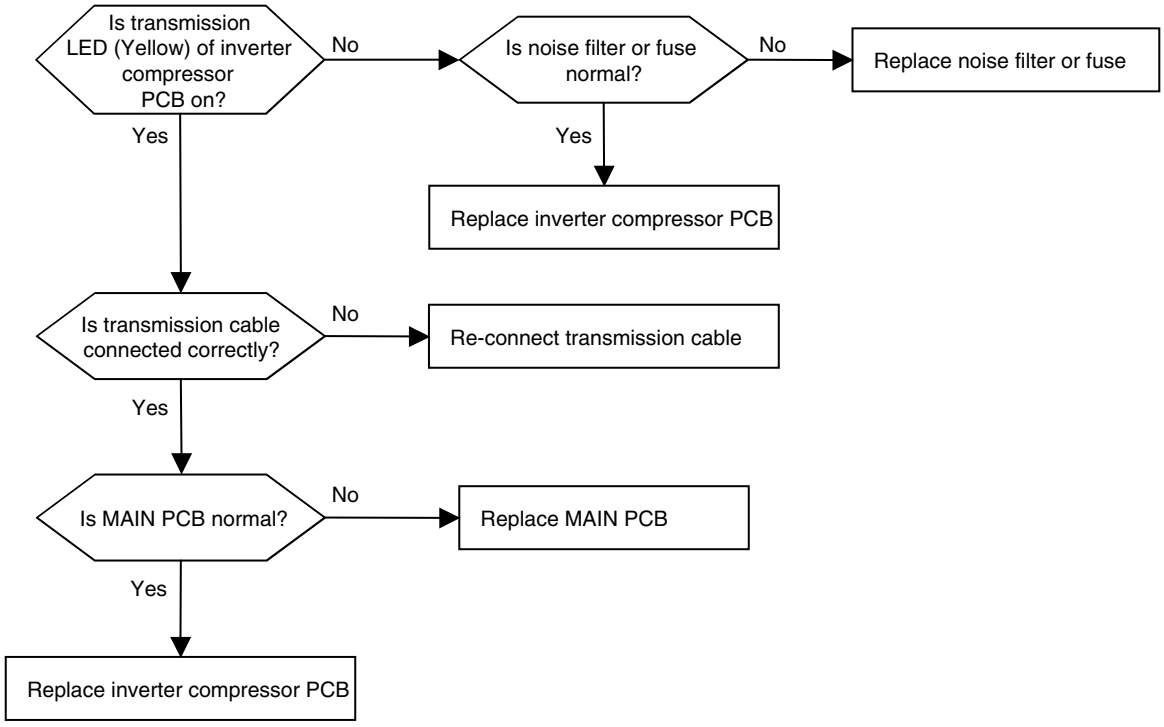
■ Error diagnosis and countermeasure flow chart



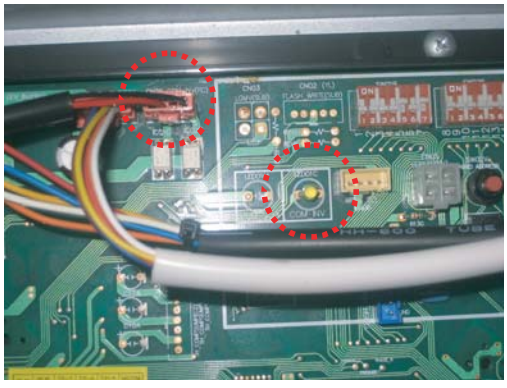
* In order to check transmission cables between outside units, check in order as below
: PCB connectors ➔ terminal block ➔ transmission cables

Error No.	Error Type	Error Point	Main Reasons
52* Master 521 Slave1 522	Transmission error between (Inverter PCB ➔ Main PCB)	Main controller of Master unit of Master unit can't receive signal from inverter controller	1. Power cable or transmission cable is not connected 2. Defect of outside Main fuse/Noise Filter 3. Defect of outside Main / inverter PCB

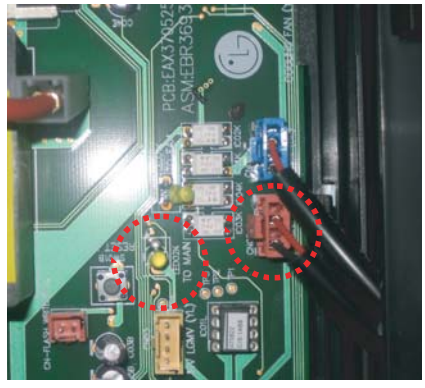
■ Error diagnosis and countermeasure flow chart



* The method of checking MAIN PCB and inverter compressor PCB (If normal, transmission LED blinks)



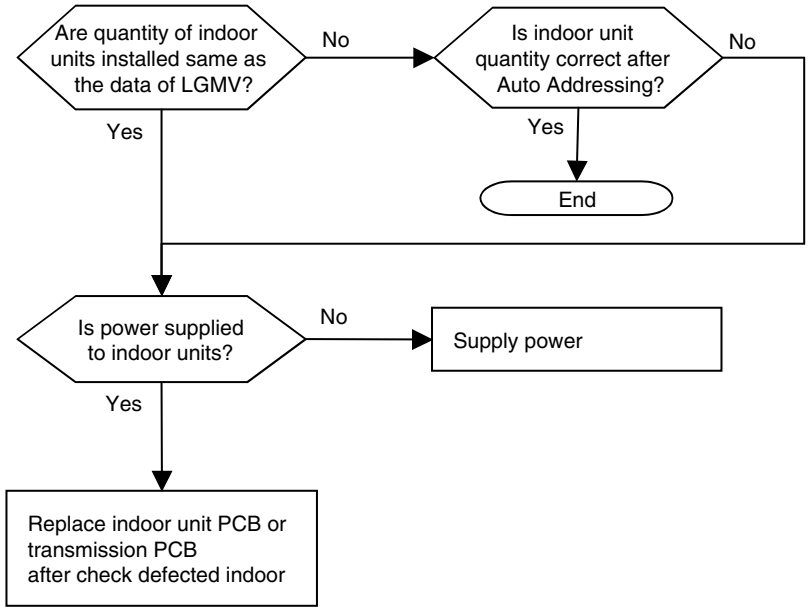
Transmission connector & LED in MAIN PCB



Transmission connector & LED in inverter compressor PCB

Error No.	Error Type	Error Point	Main Reasons
53	Transmission error (Indoor unit ➔ Main PCB)	In case Main PCB can't receive signal from indoor unit	1. Transmission cables are not connected 2. Transmission cables are short / open 3. Defect of outside Main / indoor PCB

■ Error diagnosis and countermeasure flow chart



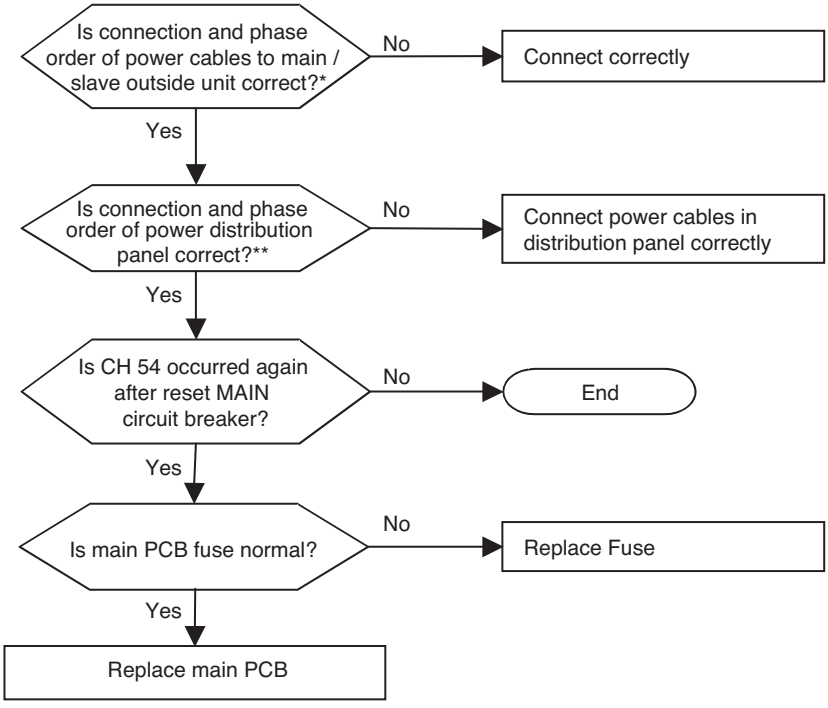
In case of CH53, almost happened with CH05, the indoor units not operated actually are normal so check with same method of CH05. and additionally check as shown as below and above flow chart

- Although the quantity of indoor units installed is same as LGMV data there may be a few indoor units with which the number of transmission is not increased with LGMV
- Although the quantity of indoor units installed is not same as LGMV data, and if transmission 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 transmission cable or power cable
  ② fault of power / PCB / transmission cable
  ③ duplication of indoor unit number
- If transmission 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

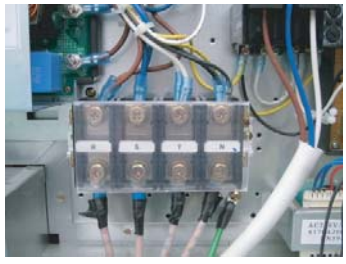
* After replacement of indoor unit PCB, Auto Addressing should be done, if central controller is installed then the central control address also should be input.
In case that only transmission PCB is replaced above process is not needed

Error No.	Error Type	Error Point	Main Reasons
54* Master 541 Slave1 542	Wrong connection of 3Ø power supply cable (Reverse direction / missing a phase)	Wrong connection of 3Ø power supply cable (Reverse direction / missing a phase)	1. Main PCB defect 2. No power of R,S,T supplied 3. Wring connection of R,S,T cables 4. Main Pcb Fuse failure

■ Error diagnosis and countermeasure flow chart



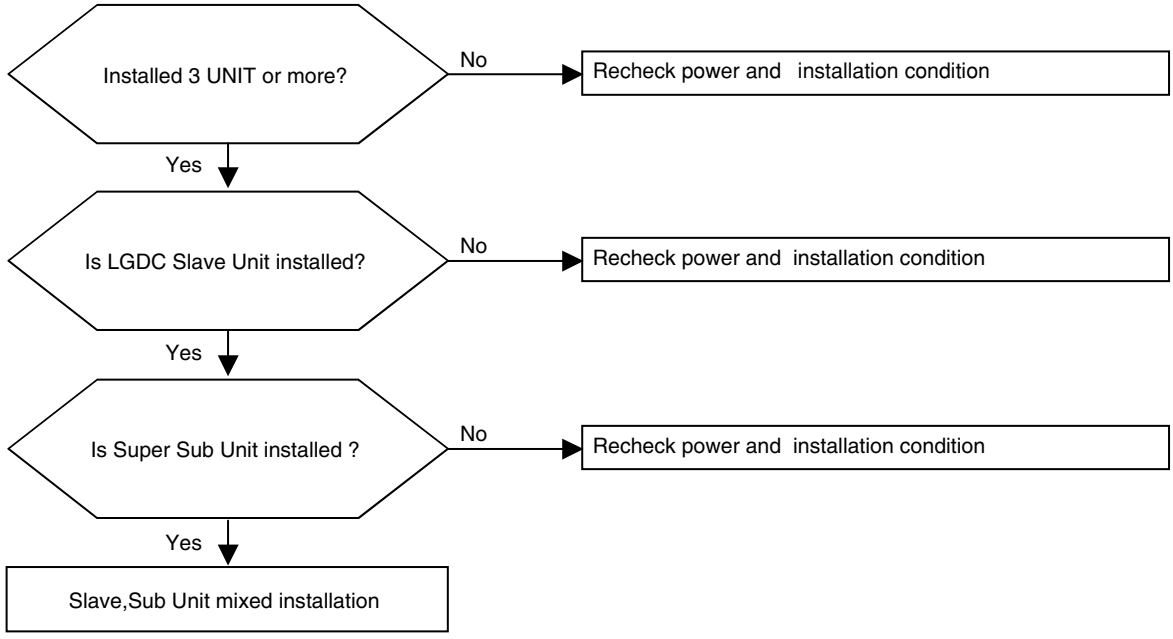
* Check power cable connection state, phase (R-S-T) order, power supply state in control box of product



** Check power cable connection state, phase order, power supply state in distribution panel

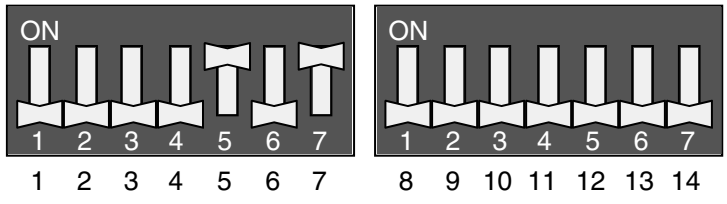
Error No.	Error Type	Error Point	Main Reasons
59	Slave ODU mixed installation	Installing old Sub ODU and new slave ODU together	Installing LGDC Slave Unit and Super sub Unit together

■ Error Diagnosis and Countermeasure Flow Chart



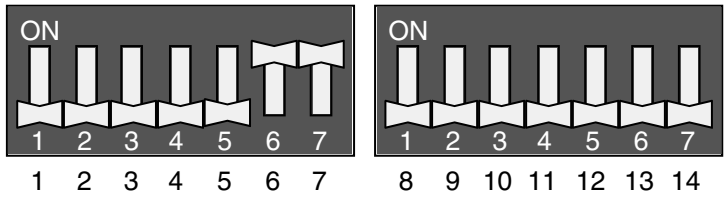
✻ Slave Unit Dip S/W Setting

Slave 1



1 2 3 4 5 6 7 8 9 10 11 12 13 14

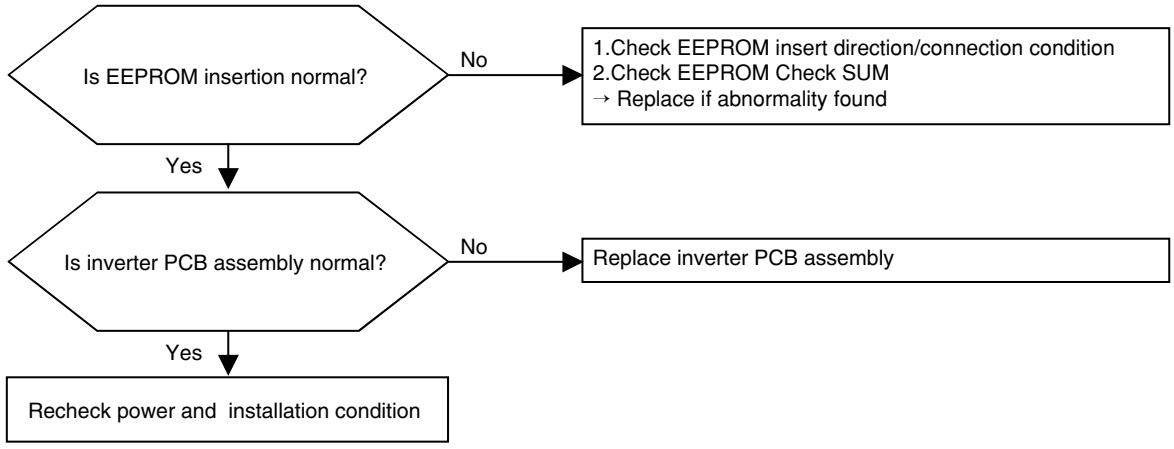
Slave 2



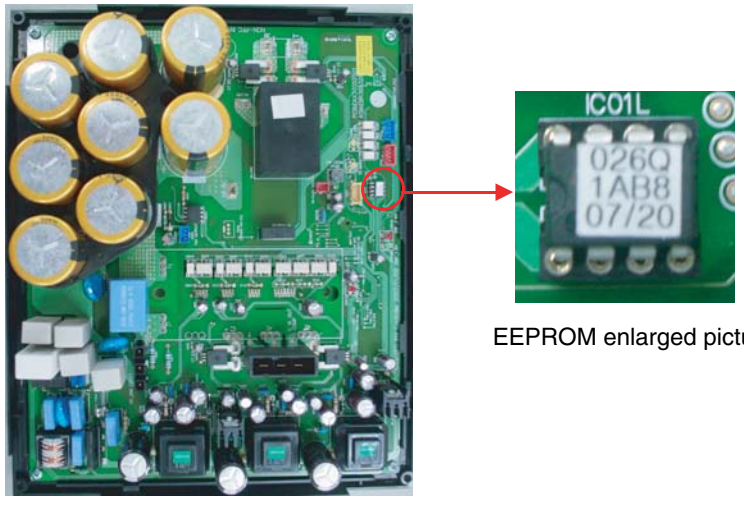
1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

■ Error Diagnosis and Countermeasure Flow Chart

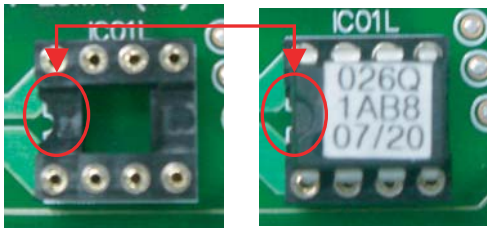


* Inverter EEPROM inserting point



EEPROM enlarged picture

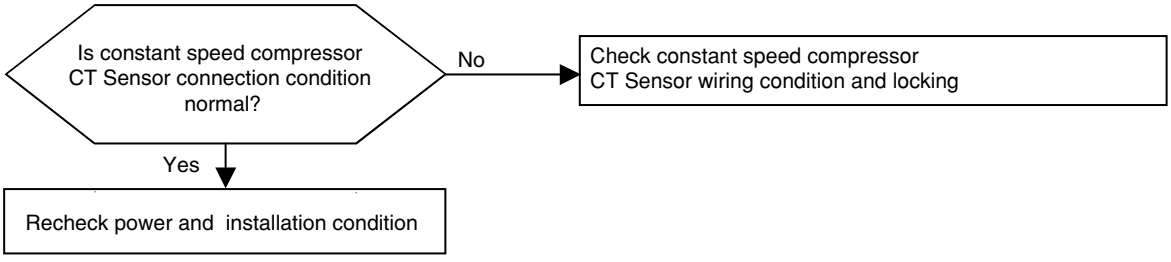
* Right inserting direction of inverter EEPROM



※ Note : Replace after power off

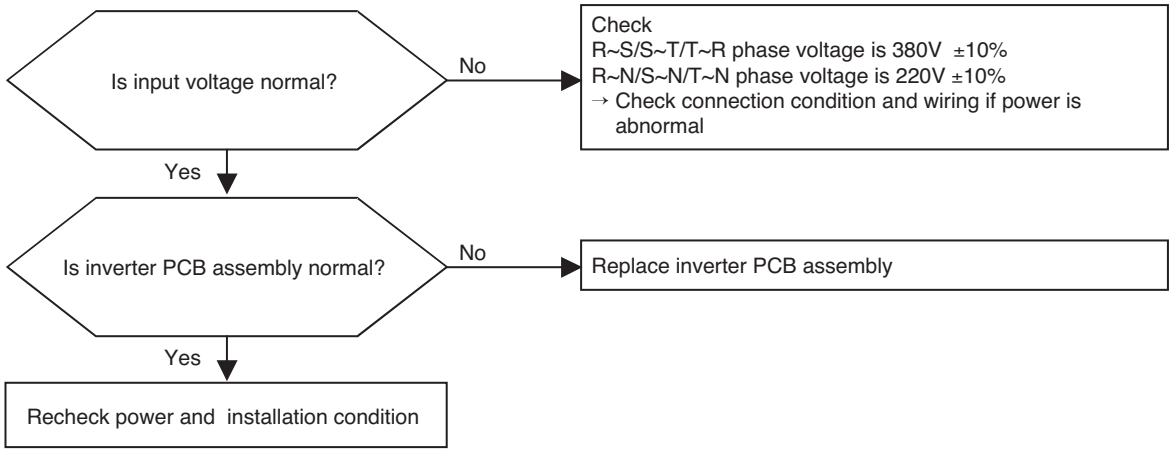
Error No.	Error Type	Error Point	Main Reasons
70* Master 701 Slave1 702	Constant Speed Compressor CT Sensor Error	Constant Speed Compressor CT Sensor Open/short	1. Constant Speed Compressor CT Sensor defect

■ Error Diagnosis and Countermeasure Flow Chart

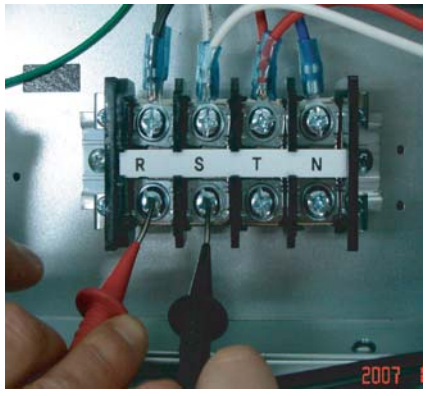


Error No.	Error Type	Error Point	Main Reasons
71* Master 711 Slave1 712	Inverter input current CT sensor error	Micom input voltage isn't within 2.5V ±0.3V at initial state of power supply	1. Input voltage abnormal (T-N) 2. ODU inverter PCB damage (CT sensing part)

■ Error Diagnosis and Countermeasure Flow Chart

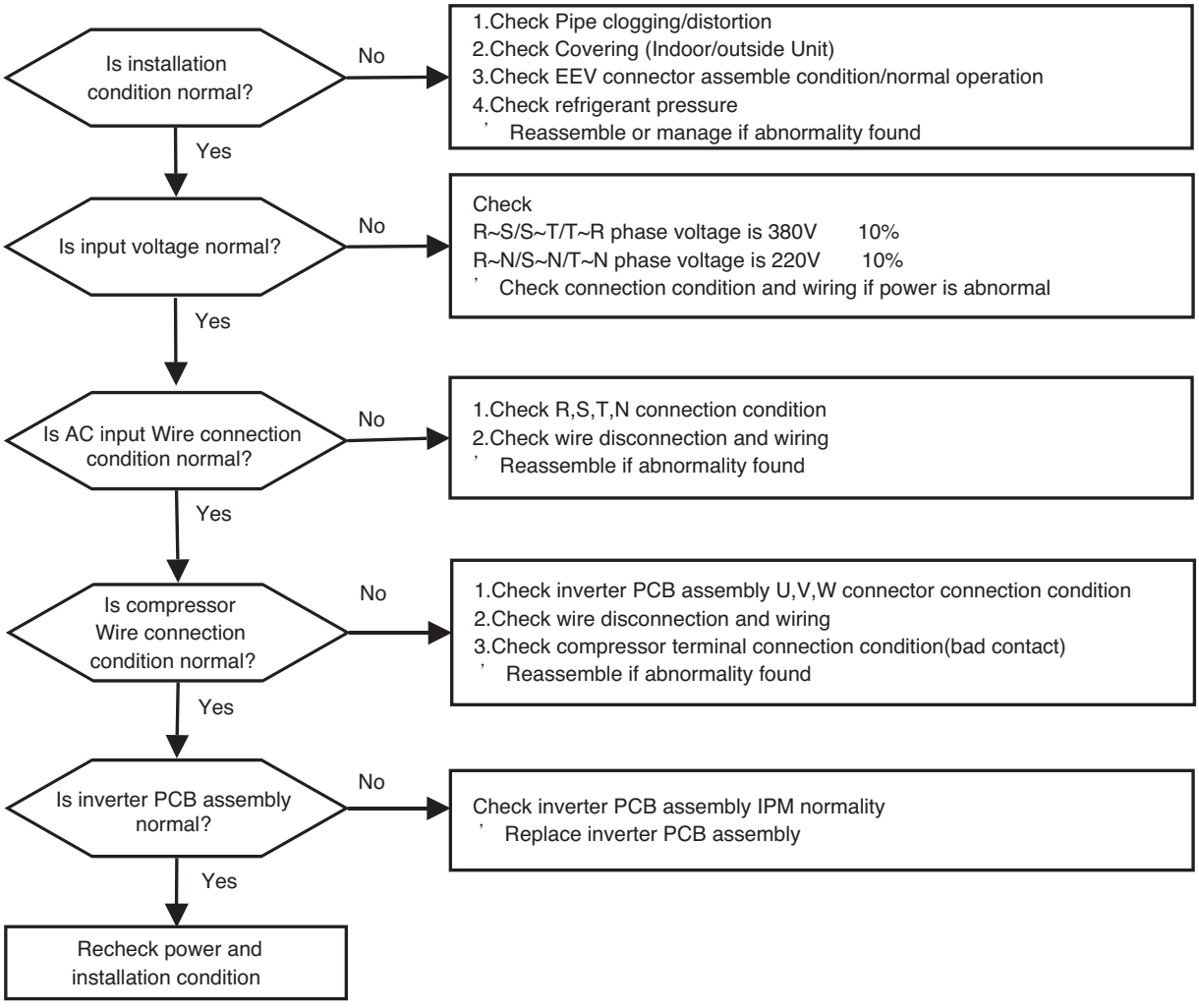


* Measuring input voltage

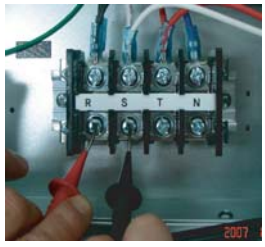


Error No.	Error Type	Error Point	Main Reasons
73* Master 731 Slave1 732	AC input instant over current error (Matter of software)	Inverter PCB input 3 phase power current is over 50A(peak) for 2ms	1.Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2.Compressor damage(Insulation damage/Motor damage) 3.Input voltage abnormal(R,S,T,N) 4.Power line assemble condition abnormal 5.Inverter PCB assembly damage(input current sensing part)

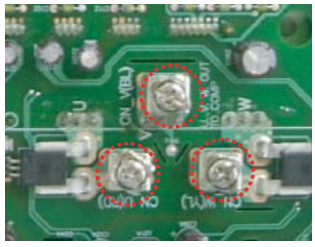
■ Error Diagnosis and Countermeasure Flow Chart



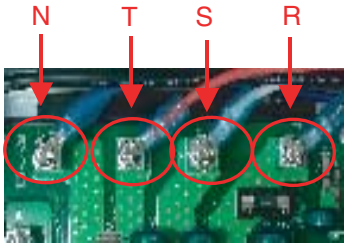
Measuring input voltage



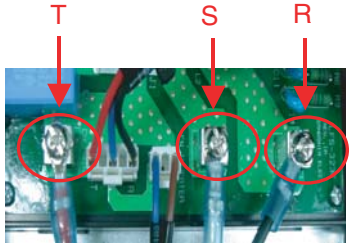
Compressor Wire Connection



Noise filter wiring



Noise filter input (upper part)



Noise filter output(lower part)

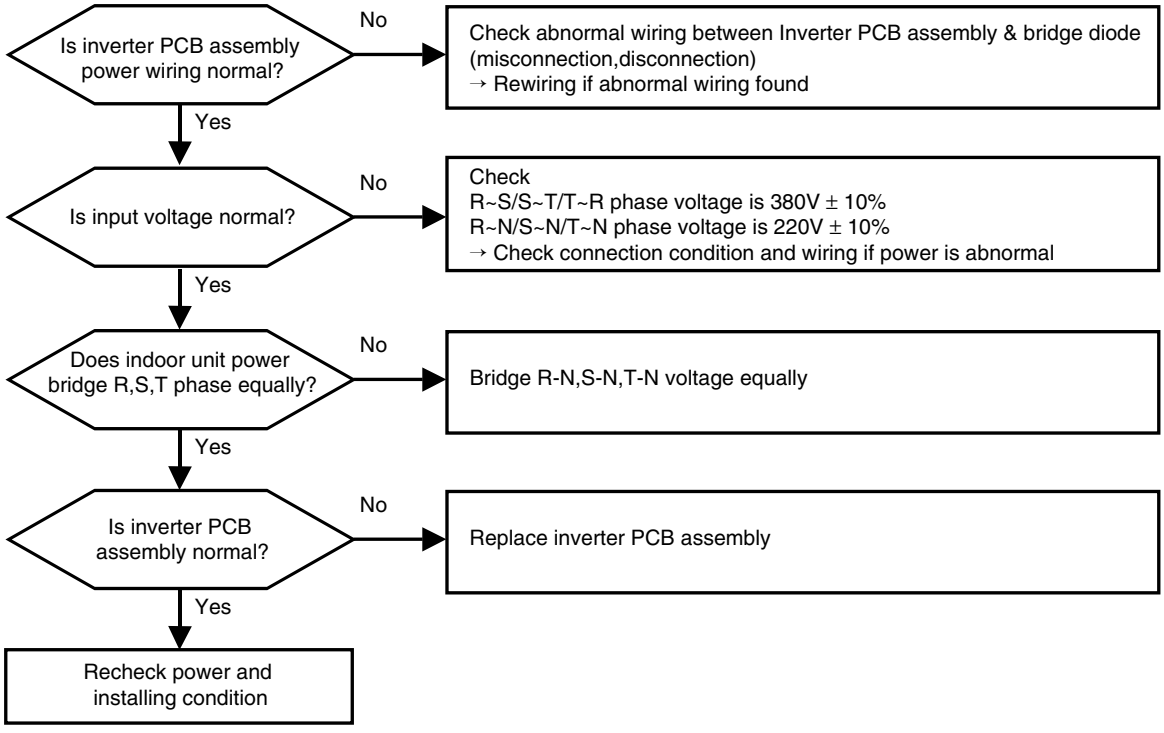
Inverter PCB assembly/Wiring power to inverter PCB on Noise filter

Inverter PCB assembly power connection

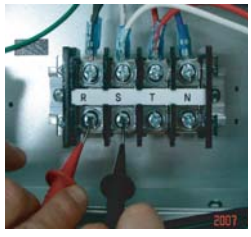
Noise filter power connection

Error No.	Error Type	Error Point	Main Reasons
74* Master 741 Slave1 742	3 Phase Power Unbalance	During operation(compressor frequency is over 50Hz), difference between R & T phase is 5A for 10 seconds.	1. CT sensor defect 2. Capacity over of AVR 3. Bridge R-N or S-N or T-N phase voltage unequally at indoor unit etc.

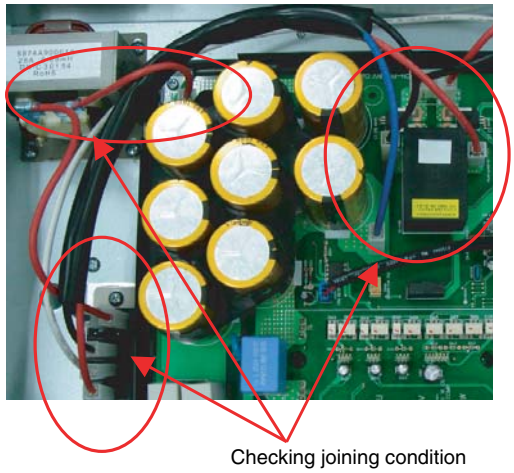
■ Error Diagnosis and Countermeasure Flow Chart



Measuring input voltage

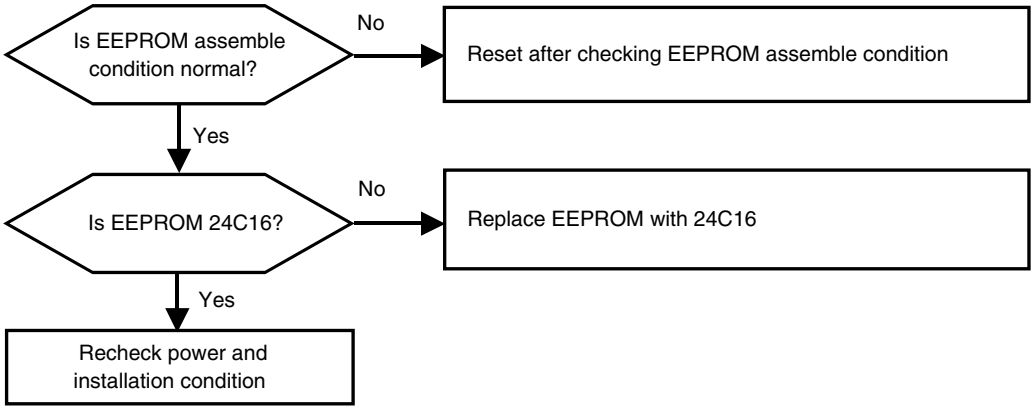


Inverter PCB & Bridge Diode wiring



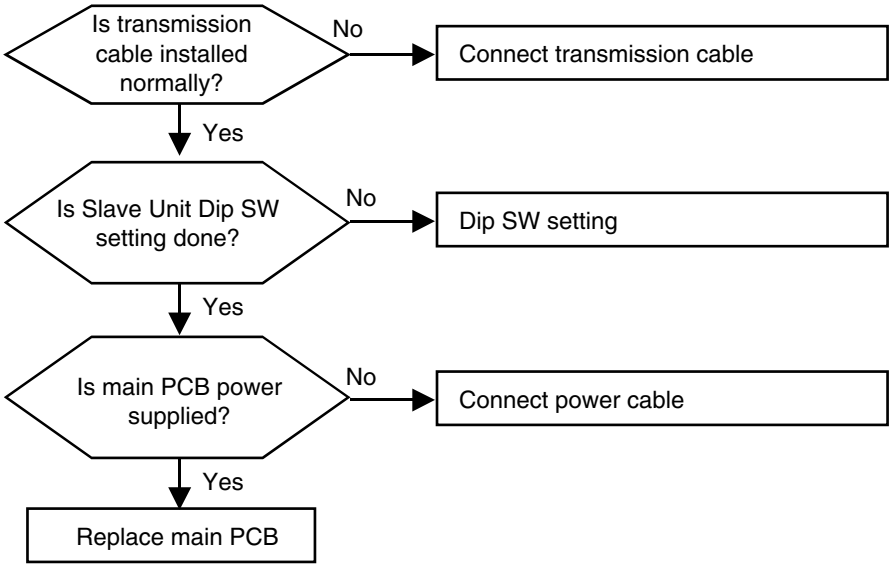
Error No.	Error Type	Error Point	Main Reasons
86* Master 861 Slave1 862	Main PCB EEPROM Error	EEPROM Access Error	1. No EEPROM 2. EEPROM wrong insertion

■ Error Diagnosis and Countermeasure Flow Chart

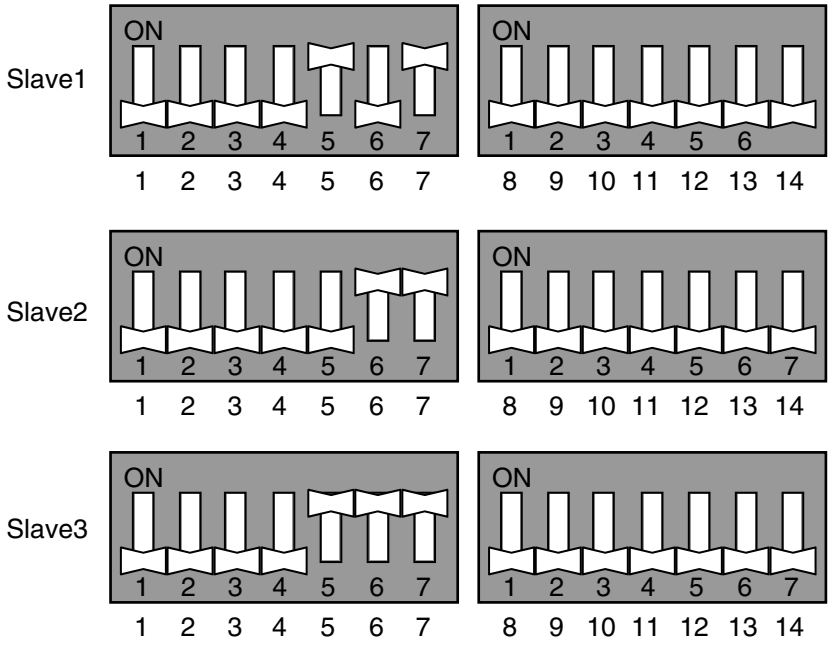


Error No.	Error Type	Error Point	Main Reasons
104* Master 11 → 041 Slave1 12 → 042	Transmission Error Between Outsides	Master displays ODU number which is not communicated. Slave displays own error number	1.Loose connection of power cable/transmission cable¿¸(Open/Short) 2.Defect of each outside unit PCB

■ Error Diagnosis and Countermeasure Flow Chart



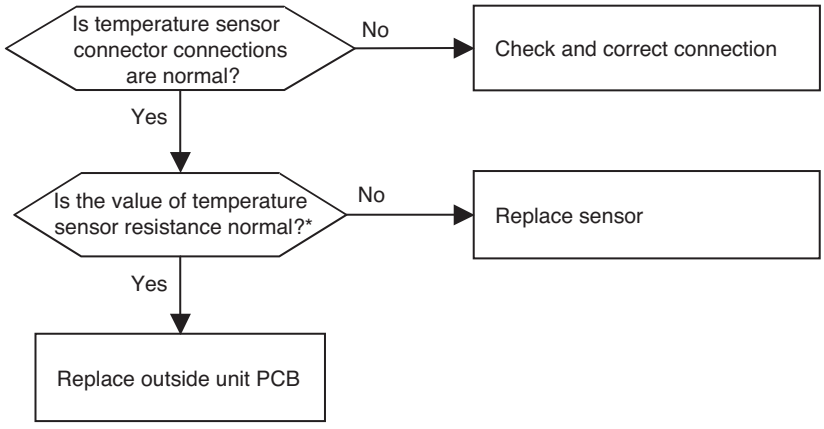
* Slave Unit Dip SW



Error No.	Error Type	Error Point	Main Reasons
113* Master 11 → 131 Slave1 12 → 132	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

Error No.	Error Type	Error Point	Main Reasons
114* Master 11 → 141 Slave1 12 → 142	Outside unit sub-cooling inlet / outlet temperature sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connecter connection 2. Defective temperature sensor (Open/Short) 3. Defective outside PCB

■ Error diagnosis and countermeasure flow chart

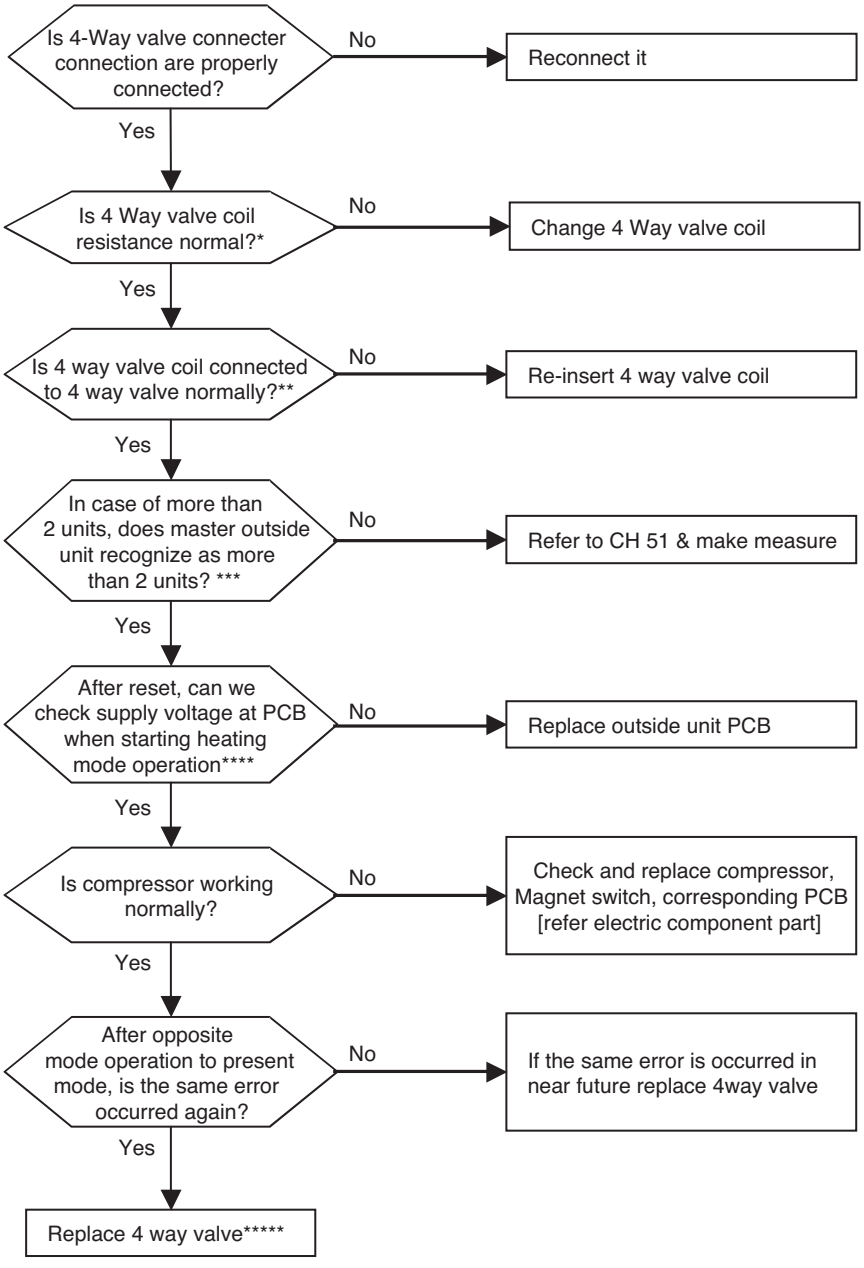


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

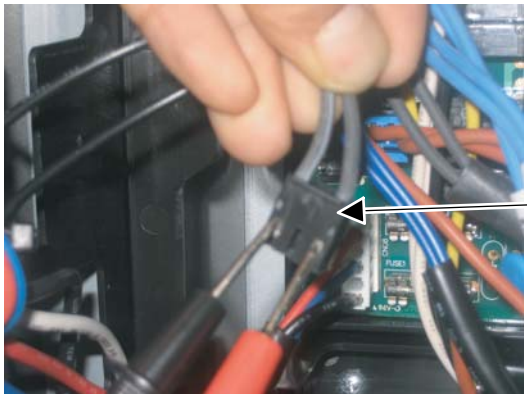
Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outside unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10°C = 20.7kΩ : 25°C = 10kΩ : 50°C= 3.4kΩ
Pipe temperature sensor: 10°C = 10kΩ : 25°C = 5kΩ :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

Error No.	Error Type	Error Point	Main Reasons
151* Master 11→511 Slave1 12→512	Function error of outside 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/outside common pipe 4. Defect of 4way valve

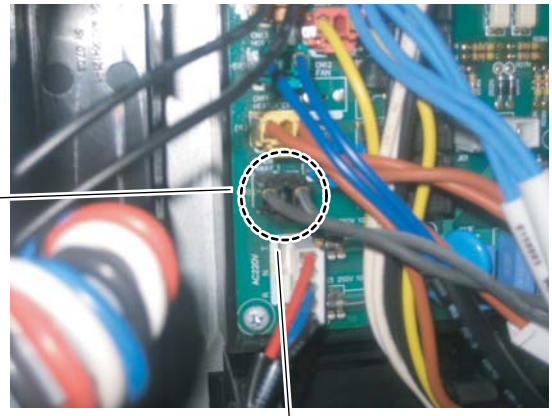
■ Error diagnosis and countermeasure flow chart



* Measure the resistance of 4way valve

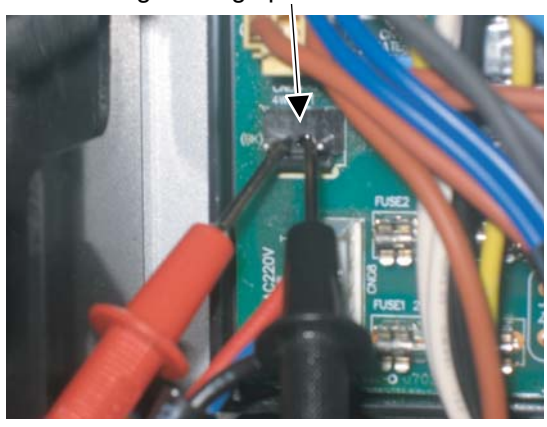


Location of 4way valve connector on Main PCB(marked as 4way,CN09)



** 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

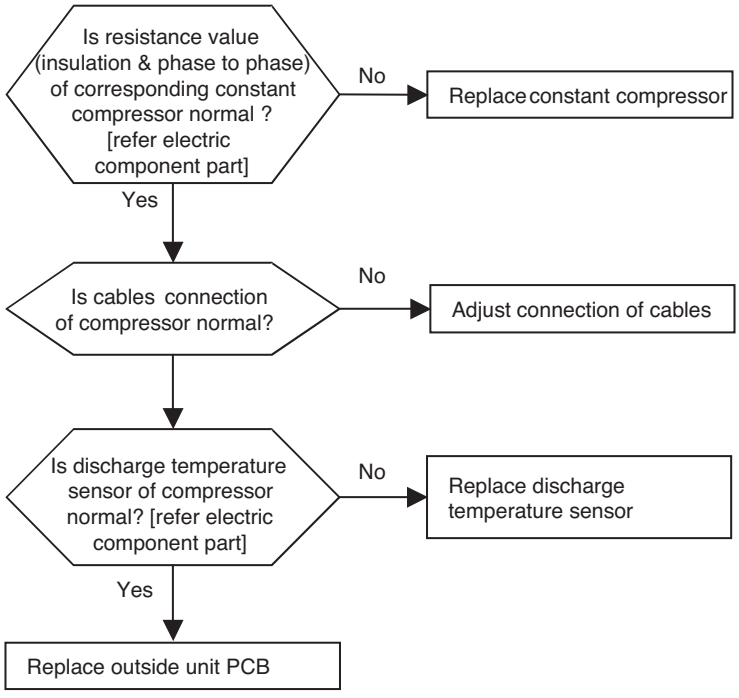
1. Model ID
   → 5HP:60 , 6HP:61 , 8HP:62 , 10HP:63, 12HP:64, 14HP:65
2. Total Capacity
   → Displayed with HP
3. ODU Type
   → HEAT PUMP : 2, Cooling : 0
4. Normal mode : 25
5. Refrigerant
   → R410a : 41

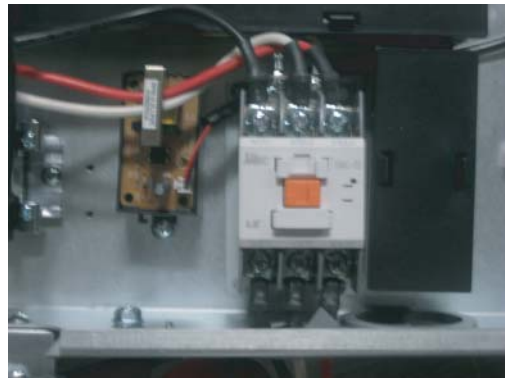
***** Checking method for outside unit of 3unit system
(Master + Slave1 + Slave2)

① Close all the SVC valves of high / low pressure common pipe
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
173* Master 11 → 731 Slave1 12 → 732	Constant compressor defect	Defect according to constant compressor damage or locking, over current	1. Constant compressor damage 2. Constant compressor input over current 3. Discharge temperature sensor defect

■ Error diagnosis and countermeasure flow chart





* cables connection between constant compressor and magnetic switch

P/NO : MFL67103701

DECEMBER , 2010