Split Systems

- **Faults**
- **LGMV program for service**

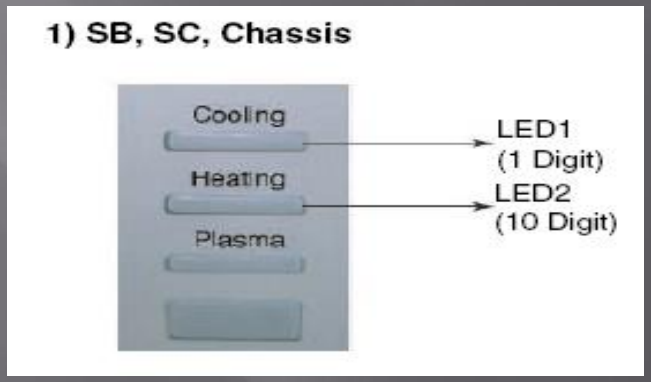
7. Self Diagnosis

Error Code	Error Indicator	Cause of Error	Display		Indoor Operation
			Indoor	Outdoor	
1		• Indoor Temp. sensor error - Sensor open or short	O		ON
2		• Outdoor Temp. sensor error - Sensor open or short	O	O	ON
4		• Heat Sink sensor error - Sensor open or short - Heat Sink temp is over 95.	O	O	ON
5		• Communication error	O	O	OFF
6		• DC Peak error	O	O	SHUT DOWN
7		• Over current error (CT2)	O	O	SHUT DOWN
8		• Indoor fan lock error (BLDC fan model only)	O		OFF
9		• Outdoor fan lock error (BLDC fan model only)	O	O	OFF
10		• D-Pipe TH. is short or open.	O	O	ON
12		• EEPROM Error - EEPROM Check sum Error		O	ON
13		• PSC Error - PSC Fault Error		O	ON
14		• Comp Phase Current Error (180 Driver Comp Control Model Only)		O	ON

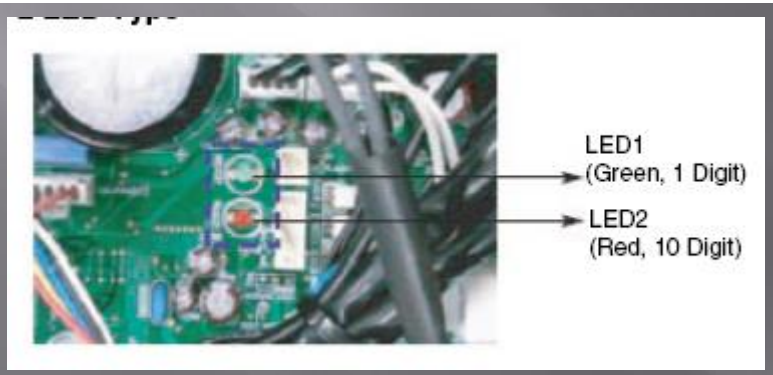
(4 Led Model)

R Series air cons

Indoor Error	Description	LED 1	LED 2
1	Indoor sensor (AIR) Open/Short	1 TIMES	.
2	Indoor sensor (entry pipe) Open/Short	2 TIMES	.
5	Communication error	5 TIMES	.
6	Indoor sensor (exit pipe) Open/Short	6 TIMES	.
9	EEPROM error (Indoor)	9 TIMES	.
10	Indoor fan lock (operational failure)		1 TIMES
12	Indoor sensor (Middle Pipe) Open/Short	2 TIMES	1 TIMES



Error Code	Description	Error Indication			
		Indoor Unit		Outdoor Unit	
		LED1	LED2	LED1	LED2
21	DC Peak (IPM Fault)	2 Times	1 Time	2 Times	1 Time
22	CT 2(Max CT)	2 Times	2 Times	2 Times	2 Times
23	DC Link Low Volt	2 Times	3 Times	2 Times	3 Times
25	Low wire volt/ high wire volt	2 Times	5 Times	2 Times	5 Times
26	DC Comp Position Error	2 Times	6 Times	2 Times	6 Times
27	PSC Fault Error	2 Times	7 Times	2 Times	7 Times
28	DC Link High Volt	2 Times	8 Tiems	2 Times	8 Tiems
29	Inverter Compressor over-current	2 Times	9 Times	2 Times	9 Times
31	CT error (low current)	3 Times	1 Time	3 Times	1 Time
32	D-Pipe High (INV)	3 Times	2 Times	3 Times	2 Times
40	CT Sensor (Open / Short)	4 Times	-	4 Times	-
41	INV. D-Pipe Th Error (Open / Short)	4 Times	1 Time	4 Times	1 Time
44	Outdoor Air Th Error (Open / Short)	4 Times	4 Times	4 Times	4 Times
45	Cond. Middle Pipe Error (Open / Short)	4 Times	5 Times	4 Times	5 Times
48	Cond. Out Pipe Error (Open / Short)	4 Times	8 Tiems	4 Times	8 Tiems
53	Communication Failure(Outdoor Unit ↔ Indoor Unit)	5 Times	3 Times	5 Times	3 Times
60	EEPROM Check Sum Error	6 Times	-	6 Times	-
61	Cond. Pipe High	6 Times	1 Time	6 Times	1 Time
62	Heatsink High	6 Times	2 Times	6 Times	2 Times
63	Cond. Pipe Low	6 Times	3 Times	6 Times	3 Times
65	Heatsink Th Error (Open/Short)	6 Times	5 Times	6 Times	5 Times



Faults R series

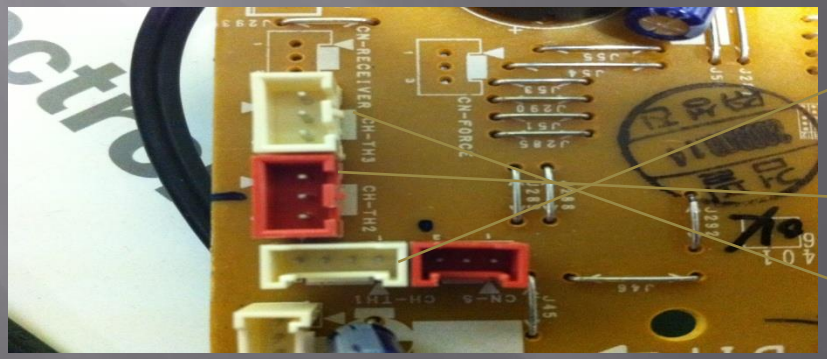
Error Code	Description	Cause	Check
01	Indoor temp sensor	Short open/ Short	Check connection and resistance
02	Indoor pipe entry temp sensor	Short open/ Short	Check connection and resistance
06	Indoor pipe exit temp sensor	Short open/ Short	Check connection and resistance
12	Indoor pipe mid temp sensor	Short open/ Short	Check connection and resistance

1. Check that the connection is secure on PCB
2. After disconnecting from PCB check resistance

R series cont…

Symbol	Colour connector	Title	Resistance	Remark
TH1	White (CN-TH1)	Indoor pipe	10kΩ	25•C Basis
TH2	RED (CN-TH2)	Mid pipe	5kΩ	25•C Basis
TH3	White (CN-TH3)	Exit pipe	5 kΩ	25•C Basis

1. **If the measurement indicates infinite (∞) or 0 Ω replace sensor**
2. **If the measurement is normal then check indoor board**



CH05 ERROR R Series

Inspection Number	Description of Inspection	Cause of Error	Check Point
CH05	Poor Communication (Indoor <-> Outdoor unit)	The communication between indoor <-> outdoor unit is stopped for more than 3 minutes.	• AC 220V power input(indoor, outdoor unit) • Disconnection of the transmission connection • Poor connection of connecting wires • Communication line short in GND • No power to outdoor unit PCB(burned) / faulty communication circuit • faulty outdoor unit PCB communication circuit • GND 1, 2 not connected to the main power GND

1. Check input power AC 220V (indoor, outdoor unit)
2. Check proper connection of the communication line => check the status of the connection wire fault and connector connections.
3. Check the resistance between the communication line and GND (normal : 2kΩ or more)
4. Check if the communication connections are properly connected.
5. Check indoor unit GND, outdoor unit GND, and main GND connections.
6. If the length of the communication line exceeds 50M, separate the communication lines.
7. Check for the products or power lines near the communication line that may cause noise.

CH06 ERROR R SERIES

Error code	Description of error	Cause of error	Check point
CH06	Indoor pipe exist temp sensor	Blocked filters Sensor short/open	Check filters Check sensor connection status and check sensor Resistance

Make sure the indoor filters are clean

CH09 & Ch10 fault R Series

Error code	Description of error	Cause of error	Check point
CH09	CN-Option PCB	Poor connection	Check connection of option PCB

Error code	Description of error	Cause of error	Check point
CH10	Indoor fan locking	If the indoor fan motor does not operate after 1 minute on start up	1. Locking of fan 2. Poor connection 3. Faulty motor 4. Faulty indoor PCB

CH21 fault R Series

1) CH21: DC Peak Error

Inspection Number	Error Detection	Cause of Error	Check Point
CH21	High current into the compressor	• Compressor blocked • Disconnection/short-circuit inside compressor • Over load operation (Outdoor fan constraint, screened, blocked) • Burned parts inside PCB	• Check compressor constraint • Check compressor wire open/short • Check compressor insulation damage • Check outdoor fan constraint / screened / flow structure • Check if IPM burned

warning Before checking PCB or each outdoor electric parts, wait for 3 minutes after the power is off. When measuring at standby state of power supply, after checking the measurement mode of the meter, be careful of the short-circuits with other parts.

• Verifying compressor

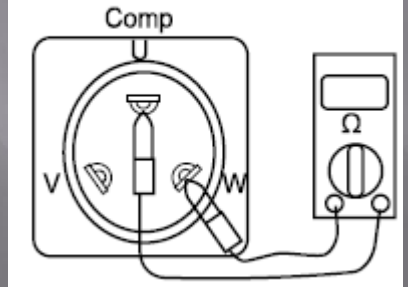


Table 1

Resistance between the lines of each terminal	
U - V	0.5 ~ 1Ω
V - W	0.5 ~ 1Ω
W - U	0.5 ~ 1Ω

Table 1

Resistance of terminal insulations	
U - chassis	1MΩ ↑
V - chassis	1MΩ ↑
W - chassis	1MΩ ↑

Blocked Filters can cause this error code
Please check make sure filters are clean

CH22 & CH 23 fault R Series

Error code	Description of error	Cause of error	Check point
CH22	AC input current is higher than the limit	Input voltage error(low Voltage) Over load operation Burnt parts	1. Check input voltage 2. Check outdoor fan 3. Check PCB

Error code	Description of error	Cause of error	Check point
CH23	DC link voltage is lower than the limit (under DC 140VMS)	Input voltage error	1. Check input voltage 2. Check PCB link voltage sensor parts

CH 26 , Ch 27 fault R series

Error code	Description of error	Cause of error	Check point
CH27	Over current on AC> DC converter circuit	1. Overload operation 2. Wrong application of reactor Spec. 3. Burned PCB internal parts	1. Check outdoor fan constraint / screened 2. Check Reactor Spec 3. Check for PCB internal part burn

Error code	Description of error	Cause of error	Check point
CH26	Over- current at the initial operation of the compressor / location sensing signal for compressor operation is not input	1. Compressor Locking 2. Overload operation, outdoor fan blocked 3. Burnt parts inside PCB 4. Burnt PCB phase	1. Check compressor locking 2. Compressor wire open/short 3. Check compressor insulation damage 4. Check outdoor fan constraint

CH 29 & Ch32 fault R series

Error code	Description of error	Cause of error	Check point
CH29	Compressor input phase current is high	1.Compressor blocked 2. Overload operation fan blocked 3. Burned PCB phase current sensor part	1. Check compressor locking 2. Check outdoor fan constraint 3. Check for PCB phase sensor part

Error code	Description of error	Cause of error	Check point
CH32	High temp in discharge pipe of the inverter compressor	Overload operation (check fan blocked) Refrigerant leak Poor inv comp discharge sensor LEV connector displaced poor LEV assembly	Check outdoor fan Check refrigerant Check sensor

CH40 etc faults R series

Error code	Description of error	Cause of error	Check point
CH40	AC input current comp phase change voltage error	1. PCB sensing circuit part burned	Check power input connector comp output current sensing circuit

Error code	Description of error	Cause of error	Check point
CH41	Inv D-pipe sensor Open/ short	Sensor displaced	Check status of sensor assembly
CH44	Outdoor inlet sensor Open/ short	Sensor burned	Check sensor is burned
CH45	Cond pipe sensor Open/short		
CH 65	b/diode Heat sink Open/ short		

Sensor Resistance Value 25 C basis
Inv D pipe sensor 200K
Outdoor inlet sensor 10K
Cond pipe sensor 5K
B/Diode Heat Sink Sensor 10K

CH 53 & CH 60 faults R series

Error code	Description of error	Cause of error	Check point
CH53	If the data transmitted by the indoor unit is not received for 3mins cont	1. No power to indoor unit. 2. Indoor/ outdoor unit power connection 3. Communication error caused by external noise 4. Indoor/ outdoor communication parts are burnt	1. Check outdoor unit power status 2. Check indoor/outdoor unit 3. Check outdoor indoor communication

Error code	Description of error	Cause of error	Check point
CH60	Incorrect Check sum of outdoor PCB EEPROM	Outdoor unit PCB EEPROM misapplied Outdoor unit PCB EEPROM poor assembly	EEPROM assembly

CH61 & CH 62

Error Code	Error Detection	Cause of Error	Check Point
CH61 On cooling	Condenser pipe sensor high	Abnormality of pipe sensor	Check temp sensor In case resistance value is OK exchange PCB
CH61 On heating	Middle pipe sensor indoor unit over temp	Sensor resistance high	Check indoor mid pipe sensor resistance

Error	Error detection	Cause	Check
CH62	High temp in outdoor PCB Heat Sink	Overload operation Poor PCB heat sink Poor PCB temp sensing parts	1. Check outdoor fan 2. Check PCB heat sink connection 3. Check PCB temp sensing parts

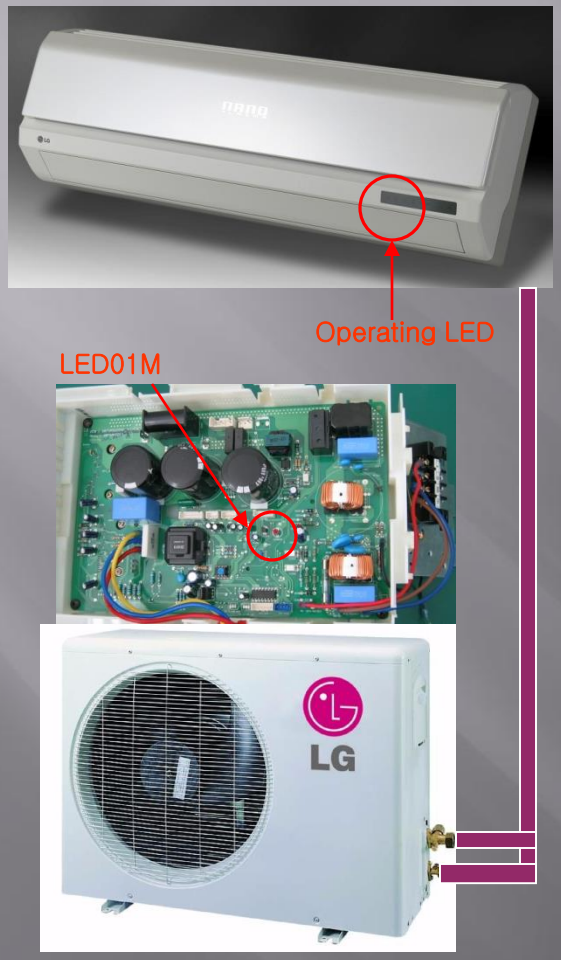
Ch 67 Fault R Series

Error Code	Description	Cause	Check
CH67	The outdoor unit fan does not come on	1. Outdoor fan lock 2. PCB connector displaced 3. outdoor PCB is faulty	1. Check status outdoor fan 2. Check of PCB fan connector assembly 3. Check fan motor wire 4. Check fan motor

Control Parts / 2)Self-Diagnosis Function older air con includes S series

Self-diagnosis Function

This function shows the state of air conditioner and indicates the cause of trouble when trouble occurs.



Error Code	Description	Display of Operating LED	Operating State
1	Indoor TH. is short or open	Blinks once	Keep operating (On)
2	Outdoor TH. is short or open	Blinks twice	Keep operating (On)
4	Heat-sink Temp. is over 95℃ / Heat-sink TH. is short or open	Blinks 4 times	Compressor restarts when Heat-sink Temp. is below 85℃
5	Communication error (serial communication)	Blinks 5 times	Off (enable to restart by remote control)
6	DC peak error	Blinks 6 times	Off (unable to restart by remote control)
7	Running current is overloaded (CT2)	Blinks 7 times	Off (unable to restart by Remote control)
8	Indoor fan is locked (DC fan only)	Blinks 8 times	Off
9	Outdoor fan is locked (DC fan only)	Blinks 9 times	Off
10	D_Pipe TH. is short or open	Blinks 10 times	Compressor off

※ Outdoor Error Indicator (LED01M on outdoor pcb assembly)

Error Code	Description	Display of LED01M	Operating State
2	Outdoor TH. is short or open	Blinks twice	Keep operating (On)
4	Heat-sink Temp. is over 95℃ / Heat-sink TH. is short or open	Blinks 4 times	Compressor restarts when Heat-sink Temp. is below 85℃
5	Communication error (serial communication)	Blinks 5 times	Off (enable to restart by remote control)
6	DC peak error	Blinks 6 times	Off (unable to restart by remote control)
7	Running current is overloaded (CT2)	Blinks 7 times	Off (unable to restart by Remote control)
9	Outdoor fan is locked (DC fan only)	Blinks 9 times	Off
10	D_Pipe TH. is short or open	Blinks 10 times	Compressor off

4-2.Control Parts / 3)Trouble Shooting for error code

Troubleshooting for error code

Error code	Description	Cause of error
1	Indoor TH. is short or open	• Indoor TH. (sensor) is short or open • Indoor TH. (sensor) is not connected to the indoor pcb assembly • Damage or defect on the sensing circuit of indoor pcb assembly. (pattern from CN-TH1 to micom port 63, 64. R01H : 6.2K, R02H : 12.1K, R03H : 1K, R04H : 1K, C01H : 1000pF, C02H : 1000pF)

Check flow

Indoor TH. is connected to indoor pcb assembly ?

YES

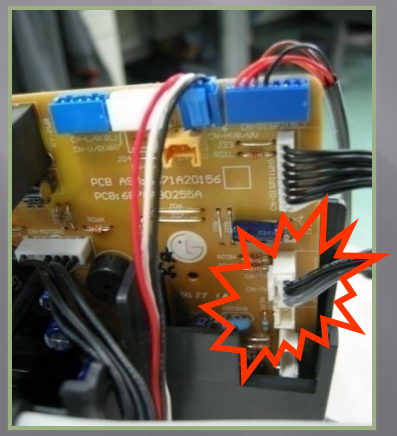
Indoor TH. is right ?

YES

Sensing circuit of indoor pcb is right ?

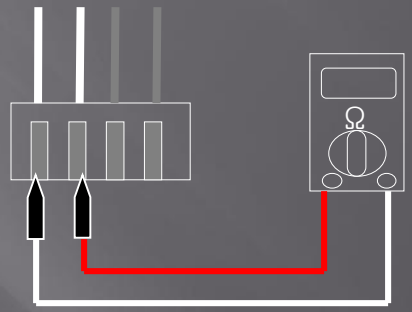
No

Connect to CN-TH1 in indoor pcb assembly



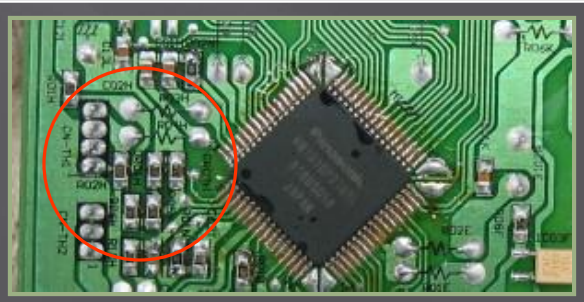
No

Check Indoor TH.
- Measure resistance of TH.
(air : about 10kΩ at 25℃,
pipe : about 5kΩ at 25℃)



No

- Check soldering state of R01H, R02H, R03H R04H, C01H, C02H
- Check spec of R01H, R02H, R03H, R04H, C01H, C02H
(R01H : 6.2K, R02H : 12.1K, R03H : 1K, R04H : 1K, C01H : 1000pF, C02H : 1000pF)



4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
2	Outdoor TH. is short or open	• Outdoor TH. (sensor) is short or open • Outdoor TH. (sensor) is not connected to the outdoor pcb assembly • Damage or defect on the sensing circuit of outdoor pcb assembly. (pattern from CN-TH1 to micom port 5, 6. R03H : 1K, R04H : 12.1K, R05H : 1K, R06H : 6.2K, C02H : 10uF, C03H : 10uF)

Check flow

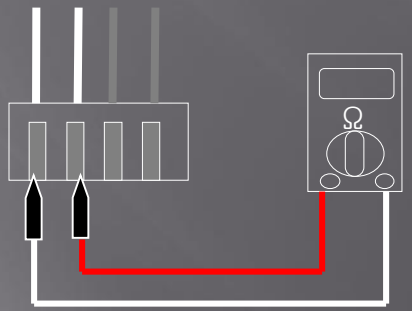
Outdoor TH. is connected to outdoor pcb assembly ?

YES → Outdoor TH. is right ?

YES → Sensing circuit of outdoor pcb is right ?

No → Connect to CN-TH1 in outdoor pcb assembly

No → Check outdoor TH.
- Measure resistance of TH. (air : about 10kΩ at 25℃, pipe : about 5kΩ at 25℃)



No →
- Check soldering state of R03H, R04H, R05H R06H, C02H, C03H
- Check spec of R03H, R04H, R05H, R06H, C02H, C03H (R03H : 1K, R04H : 12.1K, R05H : 1K, R06H : 6.2K, C02H : 10uF, C03H : 10uF)

4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
4	Heat-sink Temp. is over 95℃ Heat-sink TH. in PSC Module is damaged.	• Heat-sink TH. Pin in PSC Module is short. • Heat-sink TH. in PSC Module is damaged (short or open). • Damage or defect on the sensing circuit of outdoor pcb assembly. (pattern from PSC Module port 20. to micom port 7. R01H : 1K, R02H : 7.5K, C01H : 10uF)

Check flow

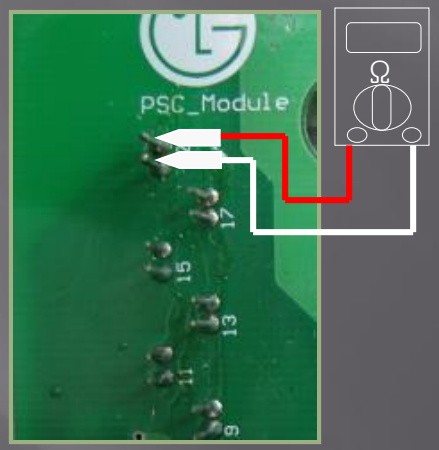
Heat-sink TH. Pin in PSC Module is short ? (Pin 19, 20)

No → Heat-sink TH. in PSC Module is right ?

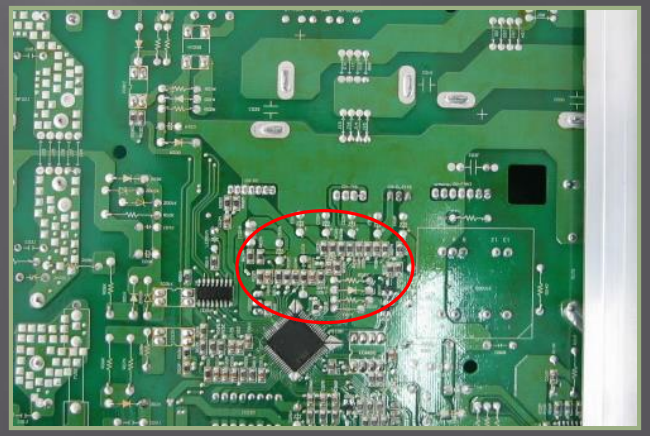
YES → Sensing circuit of outdoor pcb is right ?

YES ↓ Remove short connection from Pin 19, 20.

No ↓ Check Heat-sink TH.
- Measure resistance of TH. (about 50kΩ at 25℃)



No ↓
- Check soldering state of R01H, R02H, C01H
- Check spec of R01H, R02H, C01H (R01H : 1K, R02H : 7.5K, C01H : 10uF)



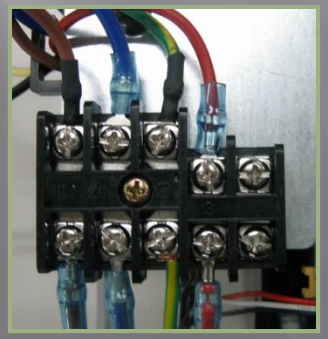
4-2.Control Parts / 3)Trouble Shooting for error code

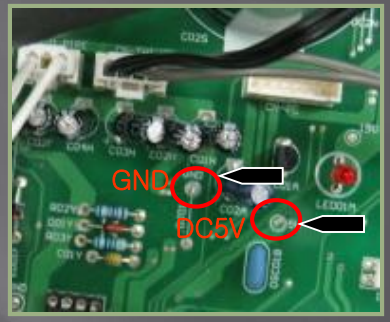
Error code	Description	Cause of error
5	Communication error	• Wiring error : Wrong or missing wiring between indoor and outdoor unitcable • AC Power Connector is not connected to the T/Block from pcb (Indoor unit) • Defect of communication components in indoor pcb assembly. (D01K, R01K~R04K, IC01K, IC02K, ZD01K, Q01K, C01K) • Defect of communication components in outdoor pcb assembly. (D01K~D03K, ZD01K~ZD03K, R01K~R10K, C01K~C04K) • Defect of outdoor pcb assembly. • No ground connection in air conditioner unit (affected by noise in power source)

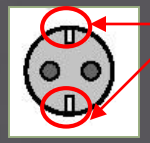
Check flow

Wiring connection is right ?
- YES → Is the voltage of T/Block ①, ② in outdoor about AC 220/240V ?
  - YES → Is the voltage of GND & DC5V in outdoor pcb about DC 5V ?
    - YES → Communication circuit of indoor & outdoor pcb Is right ?
      - YES → Ground connection is Installed ? (power outlet or outdoor Chassis)
        - YES → End
        - No → Install ground connection from outdoor unit. (In case power outlet has no earth port)
      - No → Check IC01K, IC02K, D01K~D03K, ZD01K~ZD03K, R01K~R10K, C01K~C04K
    - No → Check FUSE, NF01/02J, PTC, Power Module, PSC Module in outdoor pcb assembly (If any one has defect, replace pcb assembly)
  - No → Check power connector Is not connected to the T/Block in indoor unit.
- No → Indoor / Outdoor

Indoor	Outdoor
1(BR)	1(BR)
2(BL)	2(BL)
3(GN/YL)	3(GN/YL)
4(RD)	4(RD)





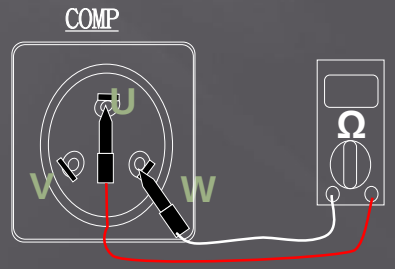


4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
6	DC peak error	• Supplied power is not normal • Connector (CN-U,V,W) is disconnected or inserted to wrong position • Compressor is damaged (coil short) ⇒ Replace compressor • Refrigerant pressure is too high • Defect in outdoor pcb assembly ⇒ Replace pcb assembly

Check flow

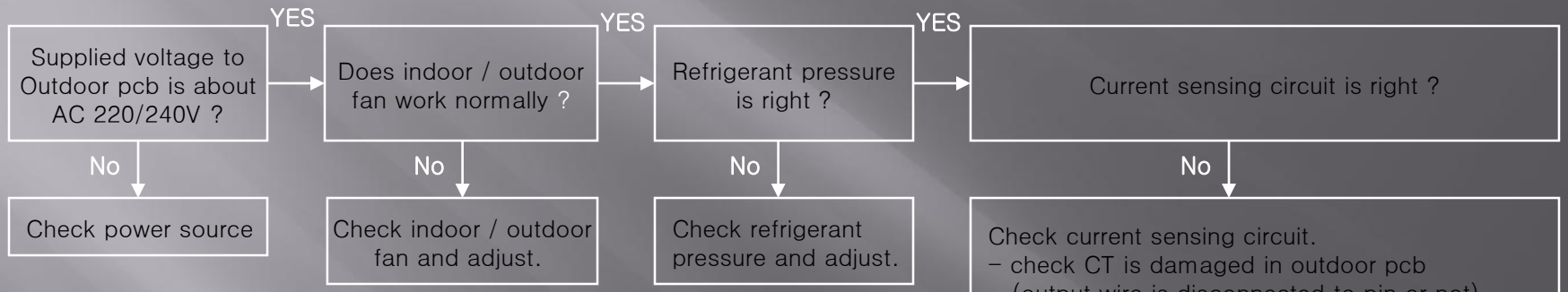
Supplied voltage to Outdoor pcb is about AC 220/240V ?
- No → Check power source
- YES → Is connector (CN-U,V,W) connected to compressor and inserted to pcb in Right position ?
  - No → Check CN-U,V,W connector (U : RD, V : BL, W : YL)
  - YES → Inverter components in Outdoor pcb assembly are right ?
    - No → Check
      ① Short of SPM3 pins
      ② Assembling state of R17Z(27mΩ)
      ③ Direction of D01Z~D03Z, C08Z,10Z,12Z,16Z
      ④ Assembling state of R01P ~ R21P & IC01P
      ⑤ Assembling state of screw between SPM3 & Heatsink
      ⑥ DC 15V output of Power module.
    - YES → Is the compressor right ?
      - No → Check resistance
        ① Between U-V, V-W, U-W port.
        → Short / Open circuit (Comp.motor coil error)
        → normal : 1 ~2 Ω
        ② Between U,V,W and Body
        → normal : over1MΩ
      - YES → Refrigerant pressure is right ?
        - No → Check refrigerant pressure and adjust.



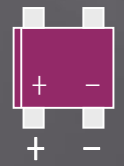
4-2.Control Parts / 3)Trouble Shooting for error code

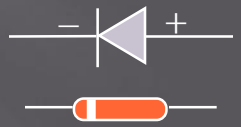
Error code	Description	Cause of error
7	Over current error (CT2)	• Supplied power is not normal • Indoor / outdoor fan is locked • Refrigerant pressure is too high • Defect in current sensing circuit in outdoor pcb assembly

Check flow 1.Product Introduction / 1-1.Introduction

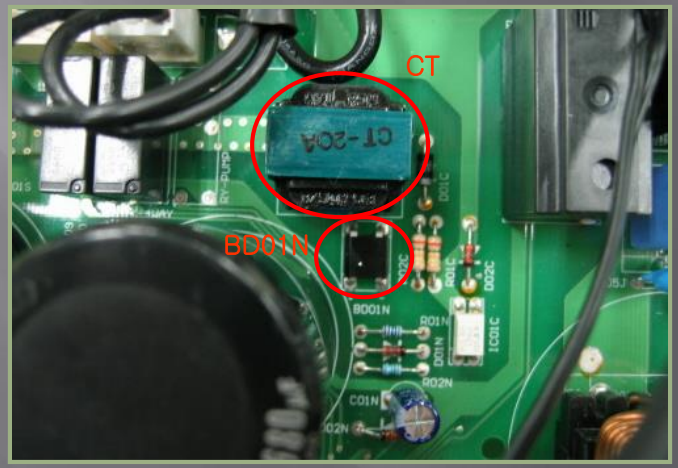


Check current sensing circuit.
- check CT is damaged in outdoor pcb (output wire is disconnected to pin or not)
- BD01N is inserted in right position (refer marking on pcb and component)
- Spec of R01N (1kΩ), R02N (1.65kΩ) is correct
- Direction of diode (D01N, D02N) is right





If any one has a defect, replace pcb assembly



4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
8	Indoor fan is locked (for DC fan model)	• Indoor fan is locked or separated. • Fan connector is not connected to indoor pcb assembly • Defective in DC-fan driving circuit

Check flow

Indoor fan is rotating ? (1)

No

Check indoor unit
- remove obstacles in indoor unit
- fan assembled correctly.

Outdoor fan is rotating ? (2)

No

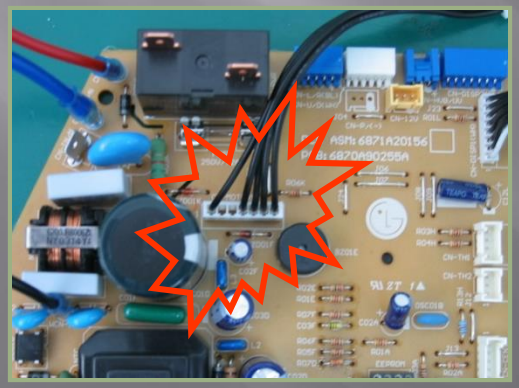
Check soldering state of CN-Motor1 & assembling State of DC Fan connector

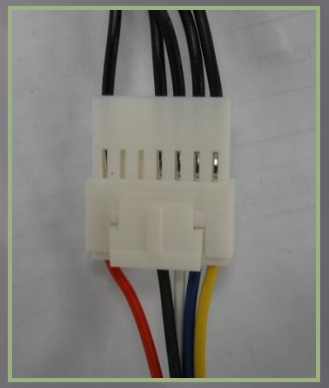
YES

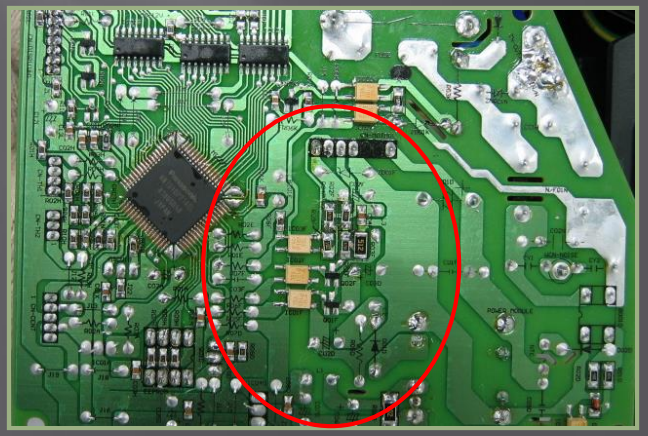
DC-fan driving circuit is right ?

No

- Check DC Fan Driving circuit (Soldering state & Direction)
  R01F~R09F, C01F~C03F, IC01F~IC03F, Q01F~Q02F, ZD01F







4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
9	Outdoor fan is locked (for DC fan model)	• Outdoor fan is locked by an obstacle (ex: branch of tree, bar…etc) • excessive head wind • Fan connector is not connected to outdoor pcb assembly • Defective in DC-fan driving circuit

Check flow

Outdoor fan is rotating ? (1)

No

Check outdoor unit
- remove obstacles in outdoor unit
- if heavy head wind blows to outdoor fan, make protection

Outdoor fan is rotating ? (2)

No

Check connector is not connected to outdoor pcb assembly (CN-FAN2)

YES

DC-fan driving circuit is right ?

No

- Check DC Fan driving circuit (Soldering state & Direction) R01F~R05F, C01F~C03F, Q01F~Q04F, ZD01F

4-2.Control Parts / 3)Trouble Shooting for error code

Error code	Description	Cause of error
10	D_PIPE TH. is short or open	• D_PIPE TH. (sensor) is short or open • D_PIPE TH. (sensor) is not connected to the outdoor pcb assembly • Damage or defect on the sensing circuit of outdoor pcb assembly. (pattern from CN-D_PIPE to micom port 4. R07H : 1K, R08H : 18K, C04H :10uF)

Check flow

D_PIPE TH. is connected to outdoor pcb assembly ?

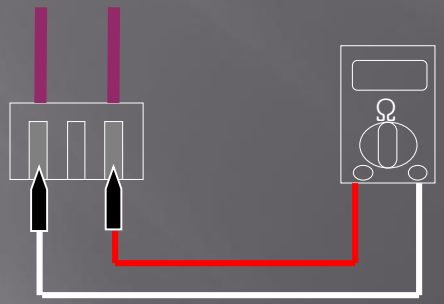
YES → D_PIPE TH. is right ?

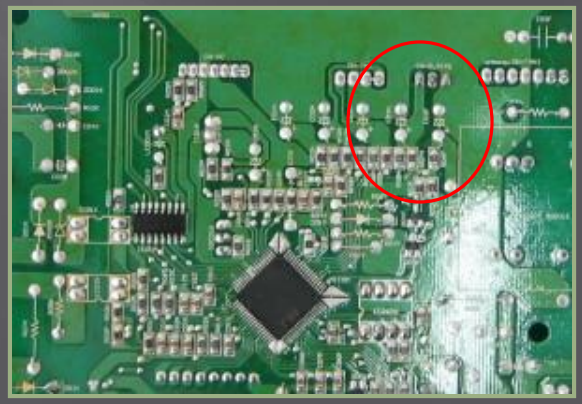
YES → Sensing circuit of outdoor pcb is right ?

No → Connect to CN-D_PIPE in outdoor pcb assembly

No → Check D_PIPE TH.
- Measure resistance of TH.
(about 200kΩ at 25℃.)

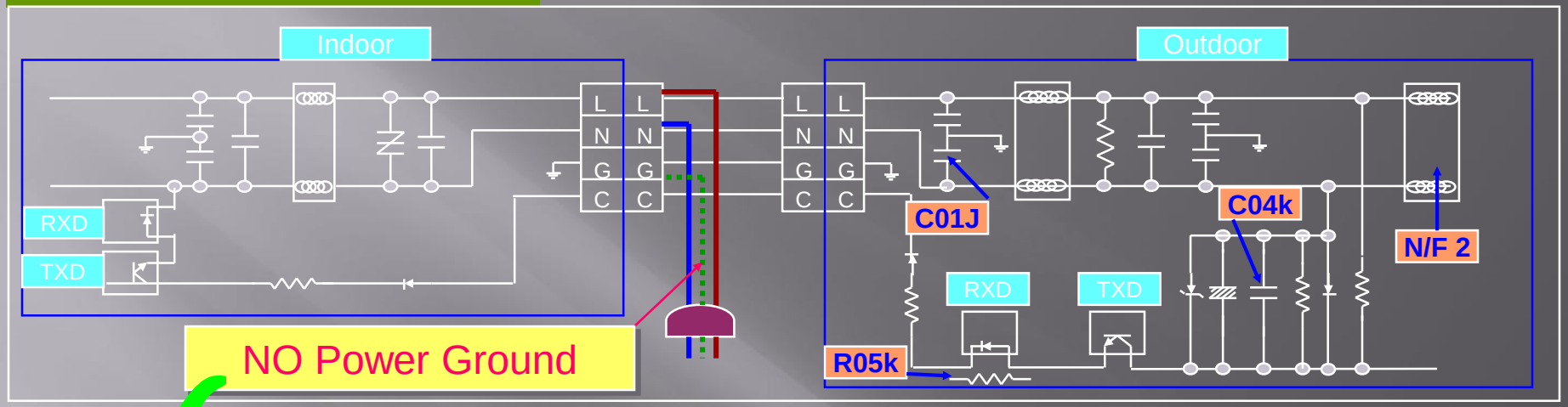
No →
- Check soldering state of R07H, R08H, C04H
- Check spec of R07H, R08H, C04H
(R07H : 1K, R08H : 18K, C04H : 10uF)



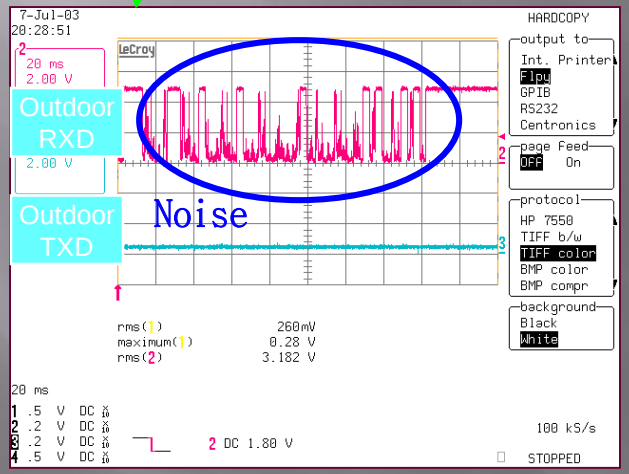


4-2.Control Parts / 4)Others

Communication Block Diagram



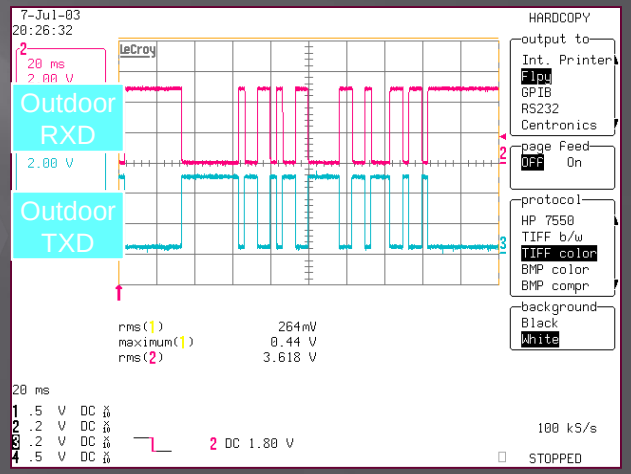
Communication Error



Indoor T/B

Outdoor PCB

Communication OK

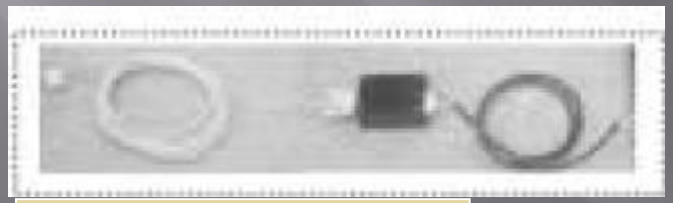


Service LGMV program

- This program can assist you in the diagnostics of inverters. (**LG recommend this**)
- You can monitor and save to your computer the running temperatures, operating frequency, fan status, of inverter air conditioning to save time and eliminate false diagnostics.
- The LGMV program can be purchased as a spare part by our spare parts department- part numbers- **5001A90032E & 5001A20200F**

LGMV disc

Hard lock key



Cable

Lap top is required

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Information gathered
On indoor unit and outdoor