Internal User Only

MULTI V 5

2017

Trouble Shooting Guide Book

LG Electronics

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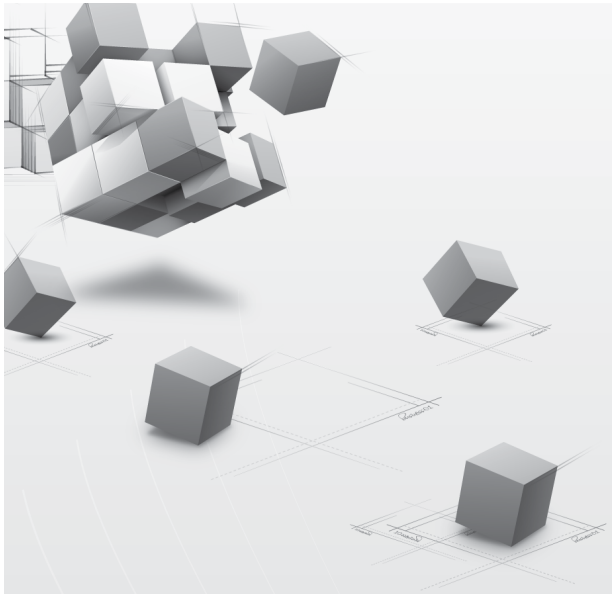

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2017
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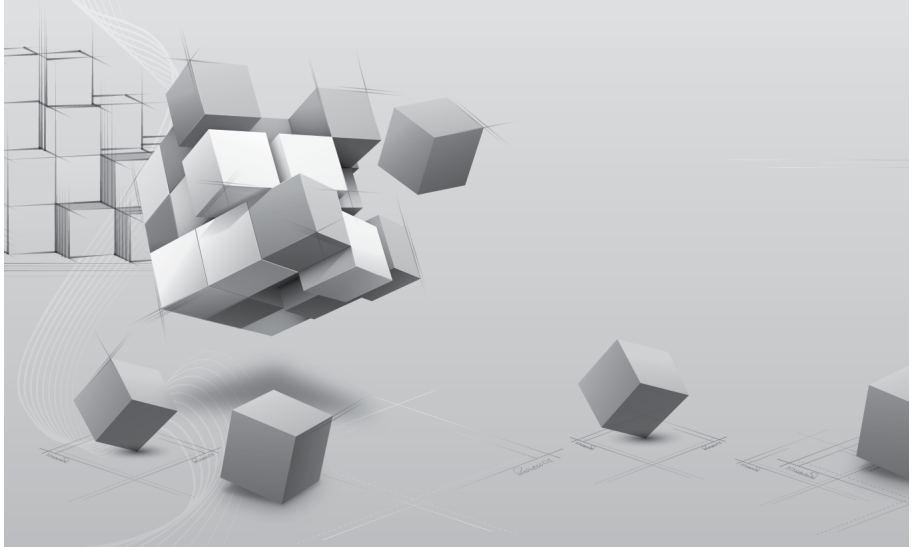
Ⅰ. Basic Part



1. Unit Conversion

Power

	kcal/h	Btu/h	(US) RT	(Japan) RT	kW	HP	Nominal HP
kcal/h	1	3.986	0.0003306	0.0003012	0.001162	0.00155	0.0004
Btu/h	0.252	1	0.0000833	0.0000759	0.000293	0.00039	0.0001
(US) RT	3.024	12.000	1	0.91	3.51628	4.69	1.251
(Japan) RT	3.320	13.174.6	1.097	1	3.861	5.149	1.373
kW	860	3.412	0.2843	0.259	1	1.333	0.3555
HP	640	2.559.5	0.213	0.1942	0.75	1	0.2667
Nominal HP	2.400	9.598.1	0.799	0.728	2.81	3.75	1

Pressure

	kgf/㎠	bar	Pa	atm	lbf/in² (psi)
kgf/㎠	1	0.98065	98.066.5	0.9678	14.2233
bar	1.0197	1	100.000	0.9869	14.5028
Pa	0.0000102	0.00001	1	0.00001	0.000145
atm	1.0332	1.01325	101.325	1	14.6959
lbf/in² (psi)	0.0703	0.06894	6894.7	0.068	1

2. Temperature Vs. Pressure of Ref.

Saturation temperature vs. saturation pressure table for each refrigerant

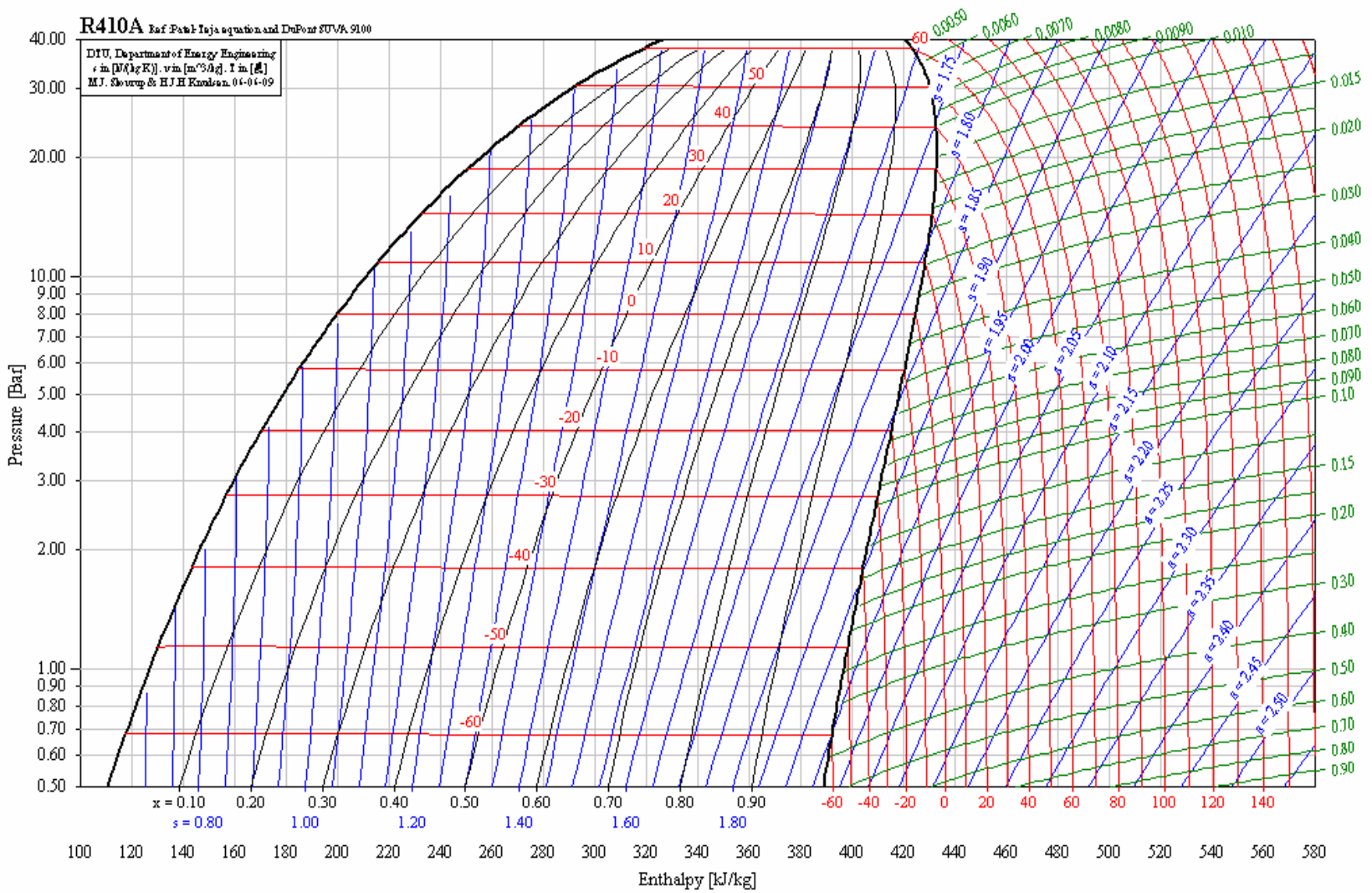
Absolute pressure = Guage pressure(kPa) + 101.325(kPa)

kPa : kgf/㎠ x 101.97

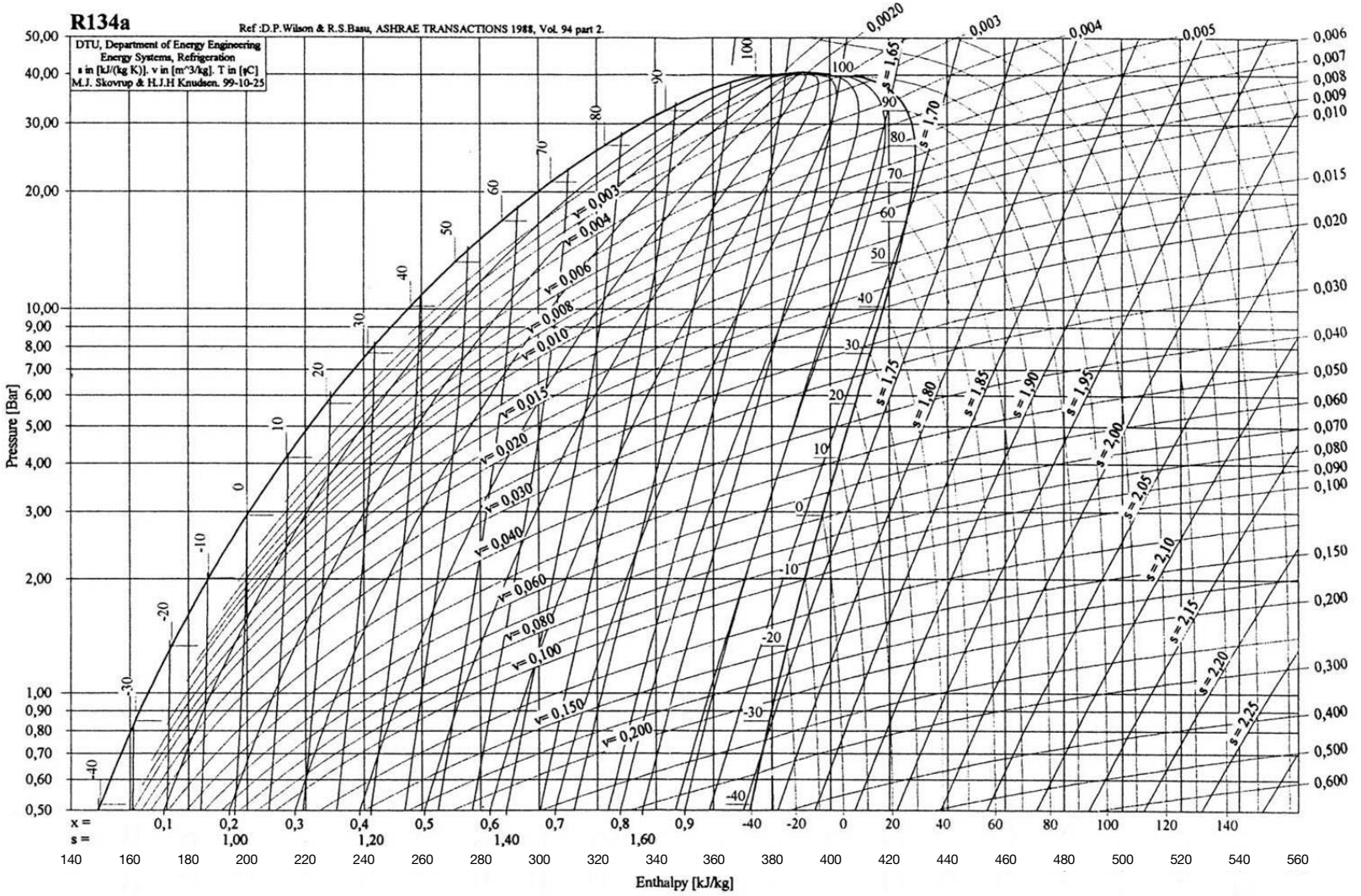
R410A					
Temp.	Relative pressure(kPaG)		Relative pressure	Temp.(℃)	
℃	Saturated Liquid	Saturated Gas	kPaG	Saturated Liquid	Saturated Gas
-30	169.62	168.91	170	-30.09	-30.02
-25	229.70	228.81	230	-25.08	-25.01
-20	299.57	298.46	300	-20.06	-19.99
-15	380.23	378.87	380	-15.09	-15.01
-10	472.75	471.09	470	-10.21	-10.12
-5	578.21	576.21	580	-4.98	-4.89
0	697.76	695.38	700	0.04	0.13
5	832.60	829.77	830	4.86	4.96
10	983.94	980.63	980	9.84	9.94
15	1153.09	1149.25	1150	14.88	14.98
20	1341.39	1336.98	1350	20.18	20.29
25	1550.25	1545.26	1550	24.98	25.08
30	1781.19	1775.59	1800	30.36	30.47
35	2035.78	2029.59	2000	34.30	34.42
40	2315.76	2309.03	2300	39.71	39.82
45	2623.00	2615.82	2600	44.62	44.73
50	2959.61	2952.13	2950	49.84	49.95
55	3328.02	3320.49	3400	55.91	56.01
60	3731.18	3724.00	3700	59.61	59.70
65	4173.11	4166.98	4200	65.28	65.34
70	4746.09	4706.31	4700	70.17	70.17

Saturation temperature vs. saturation pressure table for each refrigerant

R134a		
Temp.	Pressure	
℃	kPa	kgf/cm^2
−25	5.58	0.06
−20	31.92	0.33
−15	63.12	0.64
−10	99.79	1.02
−5	142.54	1.45
0	192.00	1.96
5	248.85	2.54
10	313.79	3.20
15	387.53	3.95
20	470.81	4.80
25	564.42	5.76
30	669.11	6.82
35	785.74	8.01
40	915.13	9.33
50	1261.00	12.40
60	1579.24	16.10
70	2013.87	20.54


R410A Ref.Patel-Raja equation and DuPont SUVA 9100
DTU, Department of Energy Engineering
s in [kJ/kg K]. v in [m^3/kg]. T in [C]
M.J. Skovrup & H.J.H Knudsen. 04-04-09
Pressure [Bar]
Enthalpy [kJ/kg]
40.00
30.00
20.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.90
0.80
0.70
0.60
0.50
100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560 580
x = 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90
s = 0.80 1.00 1.20 1.40 1.60 1.80
-60 -40 -20 0 20 40 60 80 100 120 140
60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
0.0050 0.0060 0.0070 0.0080 0.0090 0.010
0.015 0.020 0.030 0.040 0.050 0.060 0.070 0.080 0.090 0.10 0.15 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90
s = 1.75 s = 1.80 s = 1.85 s = 1.90 s = 1.95 s = 2.00 s = 2.05 s = 2.10 s = 2.15 s = 2.20 s = 2.25 s = 2.30 s = 2.35 s = 2.40 s = 2.45 s = 2.50

4. P–H Diagram_R134a

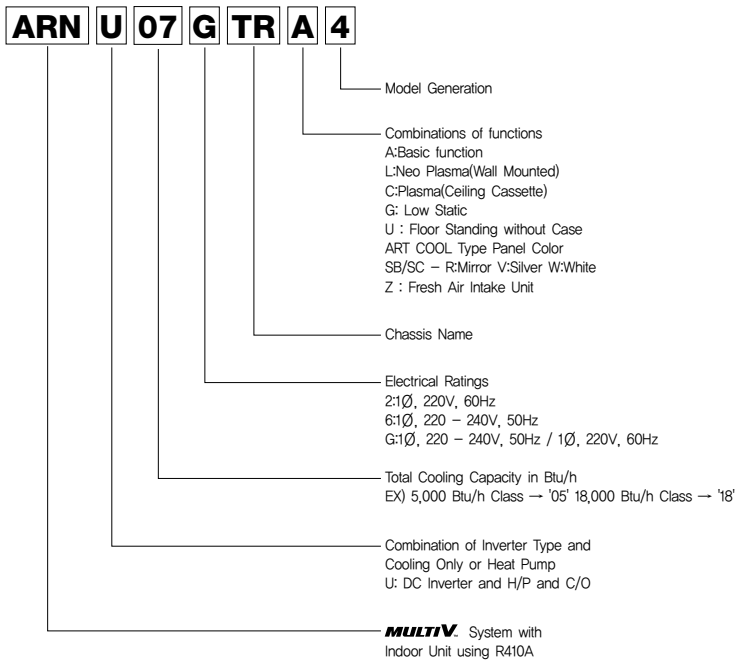


MULTI V 5

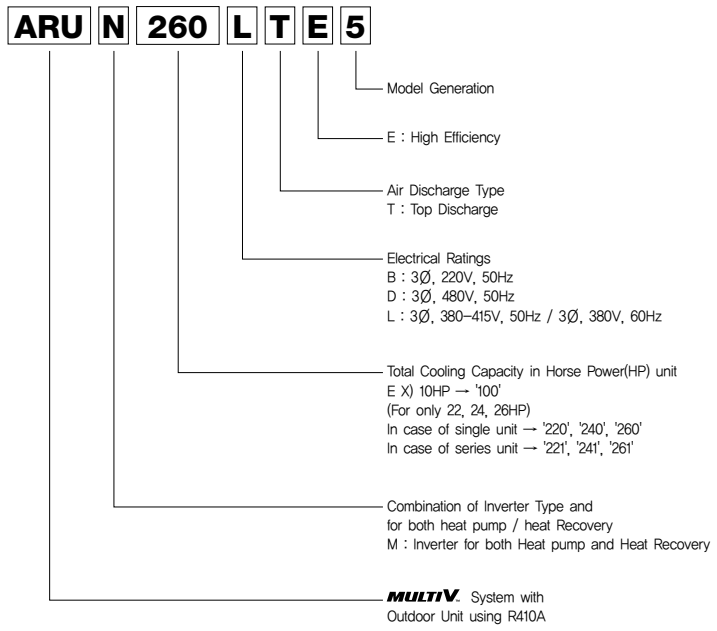
Ⅱ. Multi V 5 Introduction

1. Nomenclature

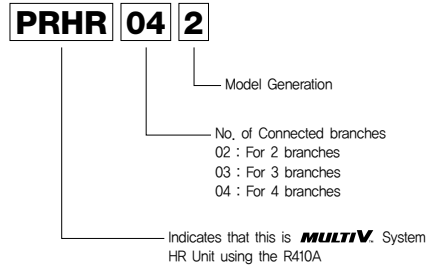
Multi V 5 Indoor Unit



Multi V 5 Outdoor Unit



Multi V 5 HR Unit



Multi V Hydro Kit

ARN H 10 G K2 A 2

- 2 — Model Generation
- A — Combinations of functions
  A: Basic function
  L: Neo Plasma(Wall Mounted)
  C: Plasma(Ceiling Cassette)
  G: Low Static
  U: Floor Standing without Case
  ART COOL Type Panel Color
  SE/S8 – R: Mirror V: Silver B: Blue
  SF – E: Red V: Silver G: Gold 1: Kiss (Photo changeable)
  Q: Console
  Z: Fresh Air Intake Unit
- K2 — Chassis Name
- G — Electrical Ratings
  1: 1Ø, 115V, 60Hz 2: 1Ø, 220V, 60Hz
  6: 1Ø, 220 – 240V, 50Hz 7: 1Ø, 100V, 50/60Hz
  3: 1Ø, 208/230V, 60Hz
  G: 1Ø, 220–240V, 50Hz/ 1Ø, 220V, 60Hz
- 10 — Total Heating Capacity in Horse Power(HP) unit
  EX) 8HP → 08' 10HP → '10'
- H — Combination of Inverter Type and Cooling Only or Heat Pump
  U : DC Inverter and H/P and C/O
  H : Hydro Kit
- ARN — MULTI V System with Indoor Unit using R134a

2. Line Up / Capacity

Multi V 5 Indoor Unit

■ Standard Model

Category		Chassis Name	Capacity(Btu/h(kW))															
			5k (1,6)	7k (2,2)	9k (2,8)	12k (3,6)	15k (4,5)	18k (5,6)	21k (6,2)	24k (7,1)	28k (8,2)	30k (9,0)	36k (10,6)	42k (12,3)	48k (14,1)	54k (15,8)	76k (22,4)	96k (28,0)
Wall Mounted Unit	Standard	SB	●	●	●	●	●											
		SC						●		●								
		SV										●	●					
ART COOL	Mirror	SB	●	●	●	●	●											
		SC						●		●								
	Gallery	SF		●	●	●												
Ceiling Cassette	1 Way	TU		●	●	●												
		TT						●		●								
	2 Way	TL			●	●		●		●								
	4 Way	TR	●	●	●	●												
		TQ					●	●	●									
		TP								●	●	●						
		TN		●			●	●					●					
		TM								●				●	●	●		
Ceiling Concealed Duct	High Static	BG									●		●	●				
		BR													●	●		
		B8															●	●
	High Sensible	BG		●	●	●	●											
		BR						●		●	●							
		B8											●	●	●			
	Middle Static	M1		●	●	●	●	●		●								
		M2									●		●	●				
		M3													●	●		
	Low Static	L1	●	●	●													
		L2				●	●	●										
		L3							●	●								
	Bulit In (Low Static)	B3		●	●	●	●											
		B4						●		●								
Floor Standing	With Case	CE		●	●	●	●											
		CF						●		●								
	Without Case	CE		●	●	●	●											
		CF						●		●								
Console		QA		●	●	●	●											
Frash Air Intake Unit		BR												●				
		B8															●	●

■ Compact Model

Category		Chassis Name	Capacity(Btu/h(kW))	
			9k(2,8)	15k(4,5)
Ceiling cassette	4 Way	TR	O	O

※ In matters of combination with Outdoor unit system, refer the PDB of that outdoor units.
※ This product contains Fluorinated Greenhouse Gases.(R410A)

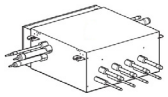
Multi V 5 Outdoor Unit

CHASSIS	Model Name	Capacity(kW)	Model
UXA	ARUM080LTE5 ARUM100LTE5 ARUM120LTE5	22.4 28.0 33.6	
UXB	ARUM140LTE5 ARUM160LTE5 ARUM180LTE5 ARUM200LTE5 ARUM220LTE5 ARUM240LTE5 ARUM260LTE5	39.2 44.8 50.4 56.0 61.6 67.2 72.8	
UXA UXA	ARUM221LTE5 ARUM241LTE5	61.6 67.2	
UXA UXB	ARUM261LTE5 ARUM280LTE5 ARUM300LTE5 ARUM320LTE5 ARUM340LTE5 ARUM360LTE5	72.8 78.4 84.0 89.6 95.2 100.8	
UXB UXB	ARUM380LTE5 ARUM400LTE5 ARUM420LTE5 ARUM440LTE5 ARUM460LTE5 ARUM480LTE5	106.4 112.0 117.6 123.2 128.8 134.4	
UXB UXB UXA	ARUM500LTE5 ARUM520LTE5 ARUM540LTE5 ARUM560LTE5 ARUM580LTE5 ARUM600LTE5	140.0 145.6 151.2 156.8 162.4 168.0	
UXB UXB UXB	ARUM620LTE5 ARUM640LTE5 ARUM660LTE5 ARUM680LTE5 ARUM700LTE5 ARUM720LTE5	173.6 179.2 184.8 190.4 196.0 201.6	
UXB UXB UXB UXB	ARUM860LTE5 ARUM880LTE5 ARUM900LTE5 ARUM920LTE5 ARUM940LTE5 ARUM960LTE5	240.8 246.4 252.0 257.6 263.2 268.8	
UXB UXB UXB UXA	ARUM740LTE5 ARUM760LTE5 ARUM780LTE5 ARUM800LTE5 ARUM820LTE5 ARUM840LTE5	207.2 212.8 218.4 224.0 229.6 235.2	

Multi V 5 Combination of Outdoor Unit

Model Name	Number of Units	Module(HP)									
		8	10	12	14	16	18	20	22	24	26
ARUM080LTE5	1	1									
ARUM100LTE5	1		1								
ARUM120LTE5	1			1							
ARUM140LTE5	1				1						
ARUM160LTE5	1					1					
ARUM180LTE5	1						1				
ARUM200LTE5	1							1			
ARUM220LTE5	1								1		
ARUM221LTE5	2		1	1							
ARUM240LTE5	1									1	
ARUM241LTE5	2			2							
ARUM260LTE5	1										1
ARUM261LTE5	2			1	1						
ARUM280LTE5	1			1		1					
ARUM300LTE5	2			1			1				
ARUM320LTE5	2			1				1			
ARUM340LTE5	2			1					1		
ARUM360LTE5	2			1						1	
ARUM380LTE5	2				1					1	
ARUM400LTE5	2					1				1	
ARUM420LTE5	2						1			1	
ARUM440LTE5	2							1		1	
ARUM460LTE5	2								1	1	
ARUM480LTE5	2									2	
ARUM500LTE5	3			1	1					1	
ARUM520LTE5	3			1		1				1	
ARUM540LTE5	3			1			1			1	
ARUM560LTE5	3			1				1		1	
ARUM580LTE5	3			1					1	1	
ARUM600LTE5	3			1						1	
ARUM620LTE5	3			1						2	
ARUM640LTE5	3				1					2	
ARUM660LTE5	3					1				2	
ARUM680LTE5	3						1			2	
ARUM700LTE5	3							1		2	
ARUM720LTE5	3								1	2	
ARUM740LTE5	4									3	
ARUM760LTE5	4			1	1					2	
ARUM780LTE5	4			1		1				2	
ARUM800LTE5	4			1				1		2	
ARUM820LTE5	4			1					1	2	
ARUM840LTE5	4			1						3	
ARUM860LTE5	4				1					3	
ARUM880LTE5	4					1				3	
ARUM900LTE5	4						1			3	
ARUM920LTE5	4							1		3	
ARUM940LTE5	4								1	3	
ARUM960LTE5	4									4	

HR Unit

Model	Chassis	Branches Number
PRHR022		2
PRHR032		3
PRHR042		4

Multi V Hydro Kit

Type	Model	Chassis	Capacity (Btu/h(kW))
Hydro Kit (For Medium Temperature)	ARNH10GK2A2	 K2	96k(28.0)
	ARNH04GK2A2		42k(12.3)

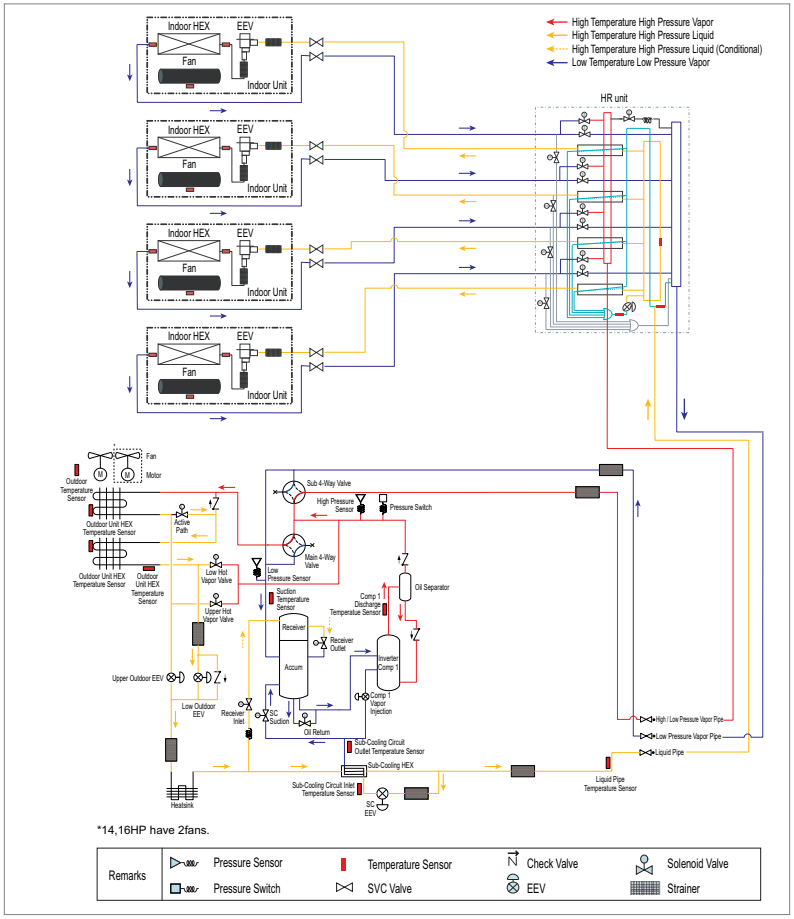
Type	Model	Chassis	Capacity (Btu/h(kW))
Hydro Kit (For high Temperature)	ARNH08GK3A2	 K3	75k(25.0)

3. Piping Diagrams

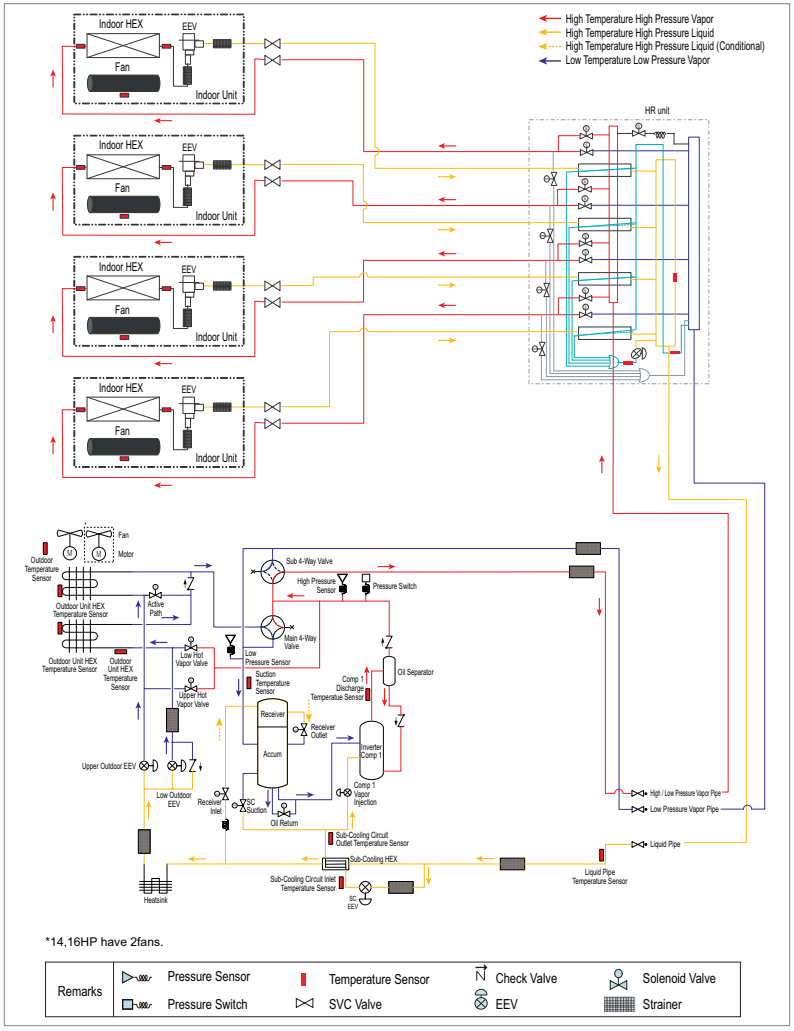
8 / 10 / 12 / 14 / 16 HP (1 Comp)

Heat Recovery System

■ Cooling Operation



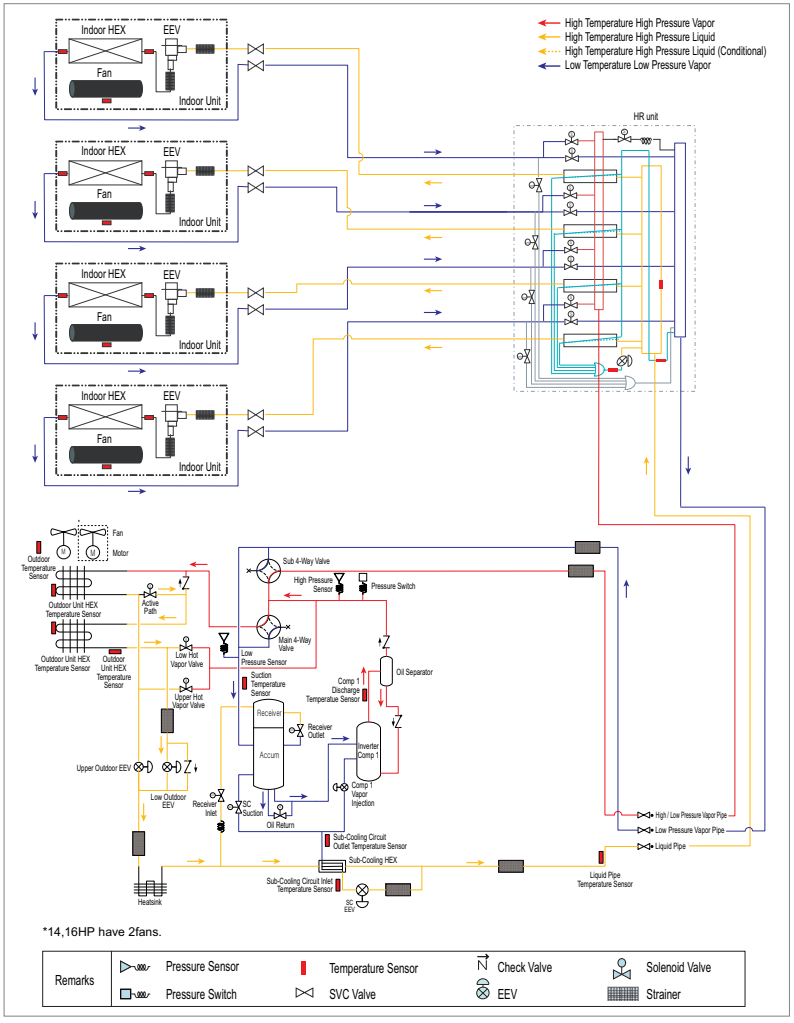
■ Heating Operation



*14,16HP have 2fans.

Remarks							
	Pressure Sensor	Temperature Sensor	Check Valve	Solenoid Valve
	Pressure Switch	SVC Valve	EEV	Strainer

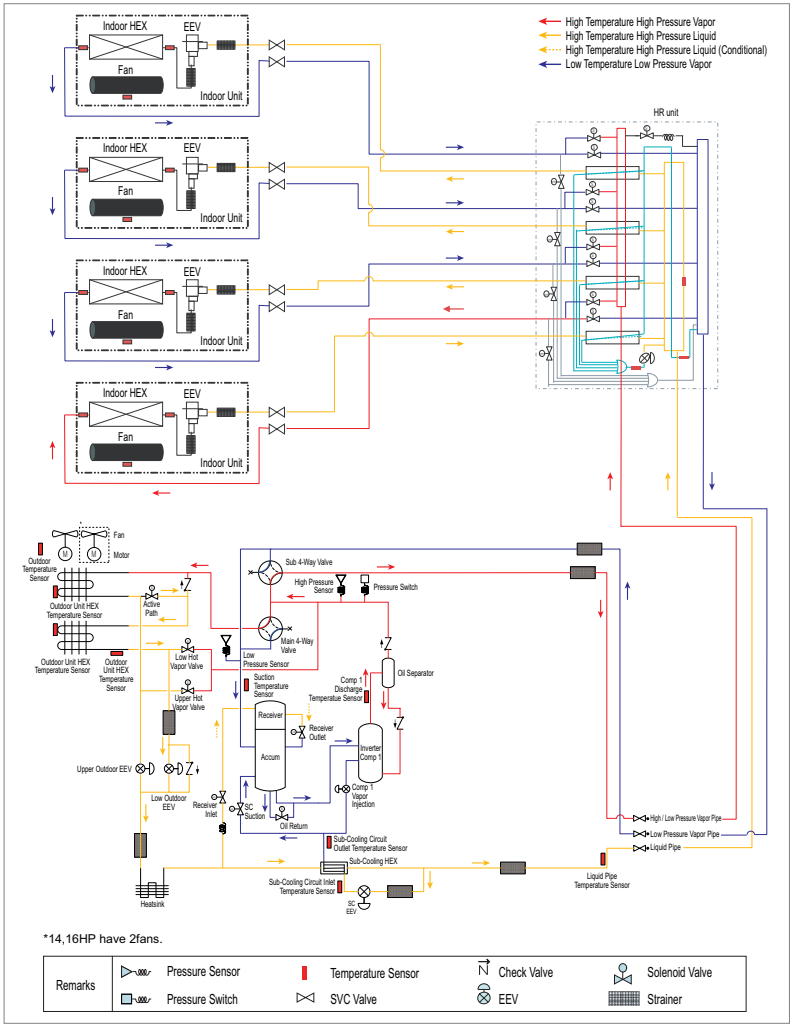
■ Oil Return/ Defrost Operation



*14,16HP have 2fans.

Remarks							
	Pressure Sensor	Temperature Sensor	Check Valve	Solenoid Valve
	Pressure Switch	SVC Valve	EEV	Strainer

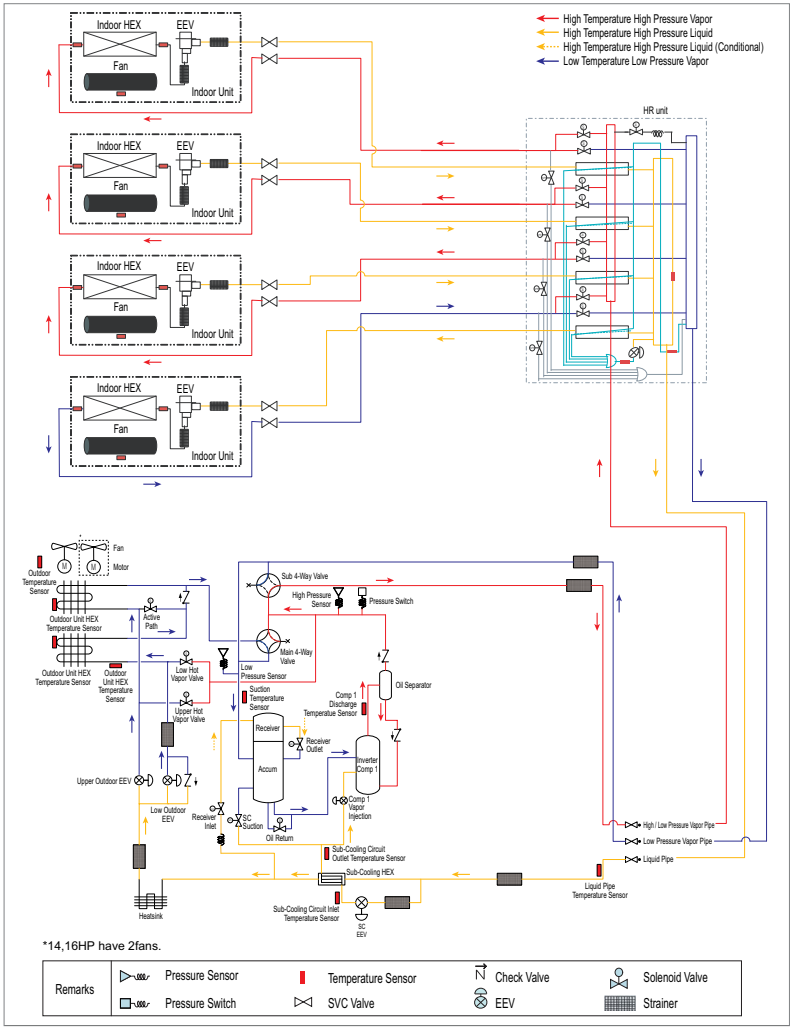
■ Cooling-based Simultaneous Operation



*14,16HP have 2fans.

Remarks							
	Pressure Sensor	Temperature Sensor	Check Valve	Solenoid Valve
	Pressure Switch	SVC Valve	EEV	Strainer

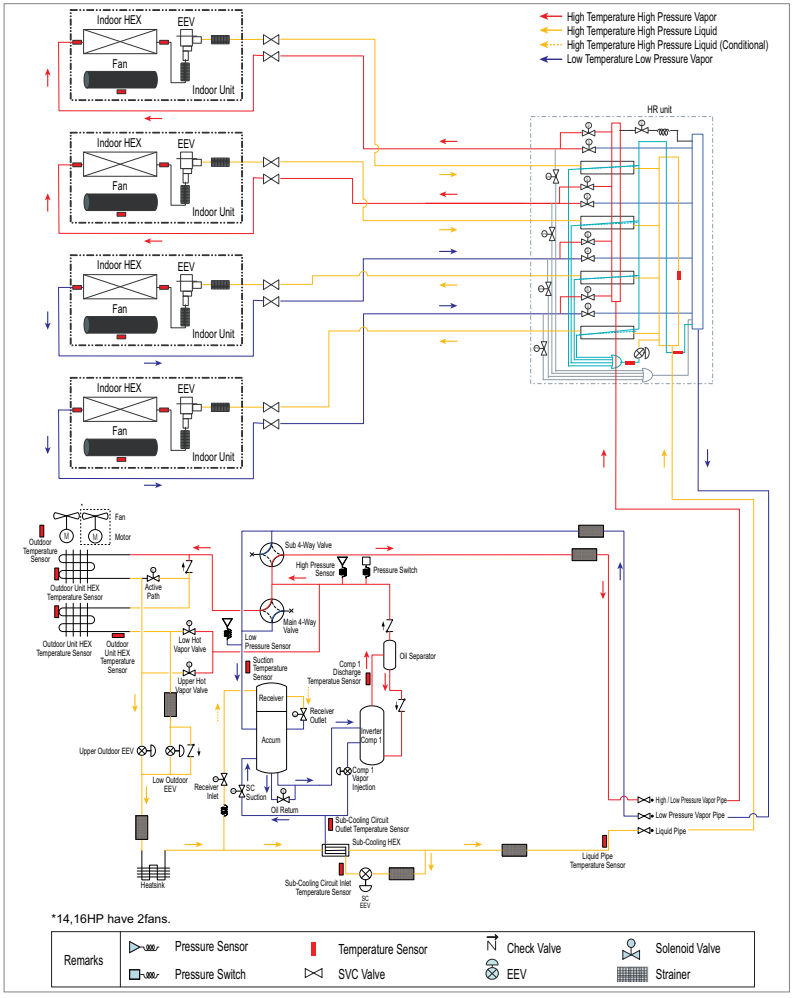
■ Heating-based Simultaneous Operation



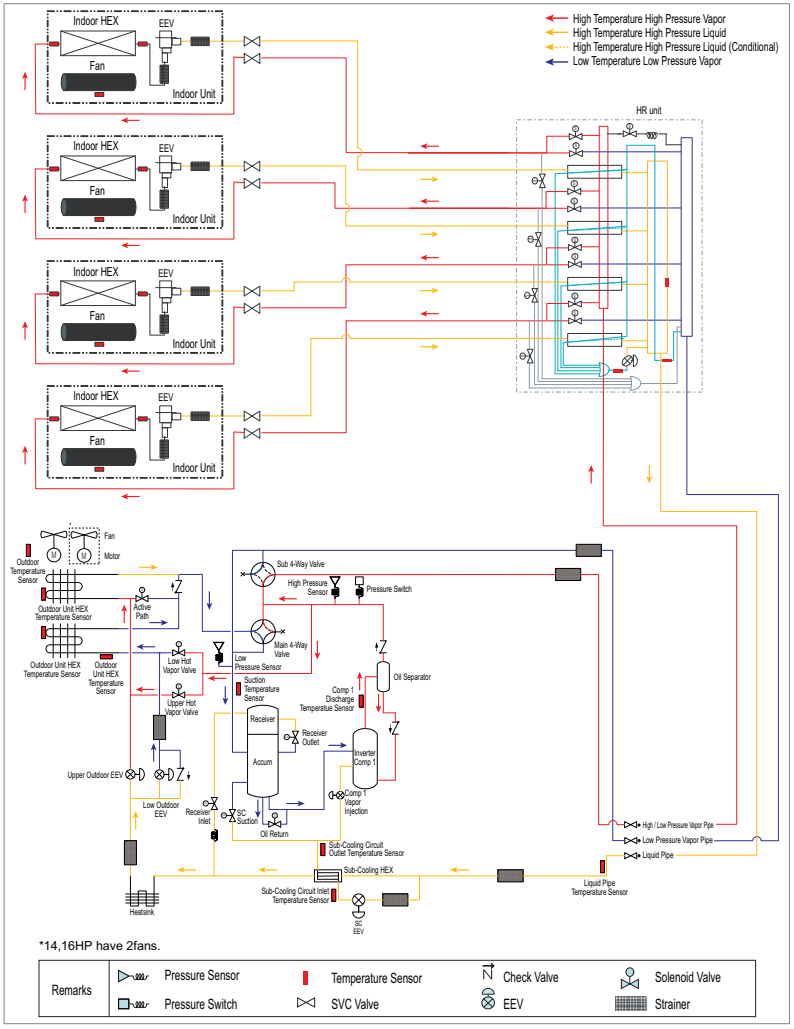
*14,16HP have 2fans.

Remarks							
	Pressure Sensor	Temperature Sensor	Check Valve	Solenoid Valve
	Pressure Switch	SVC Valve	EEV	Strainer

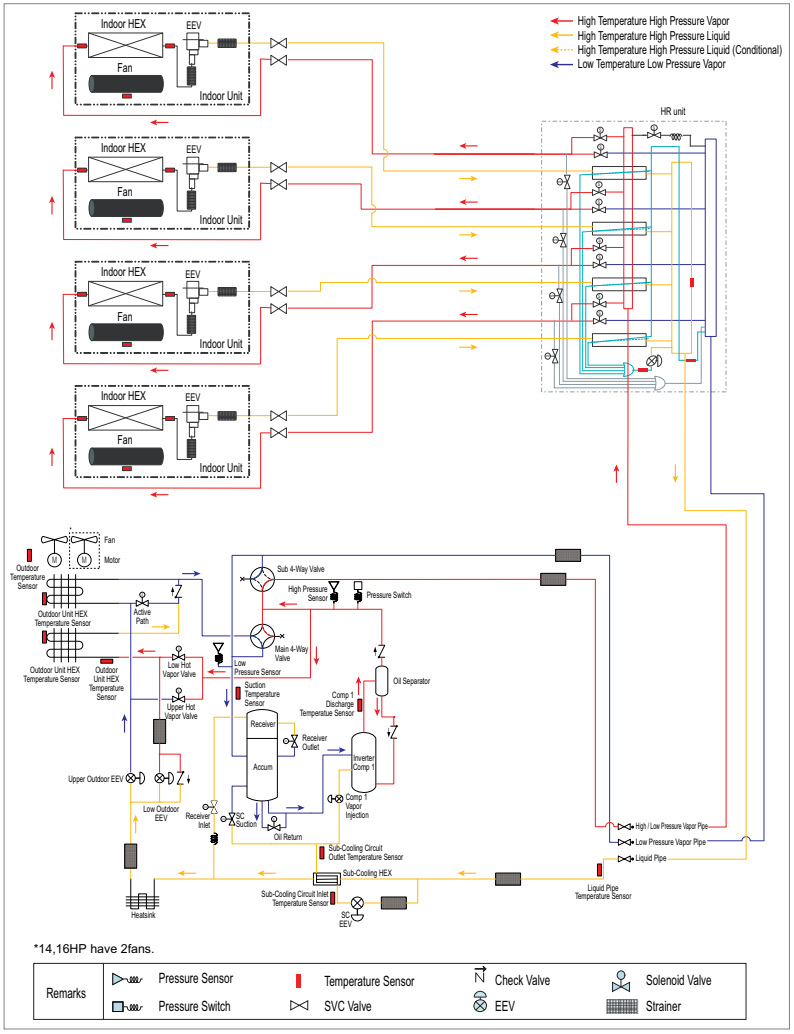
■ Balanced Simultaneous Operation



■ Upper HEX Defrost Operation

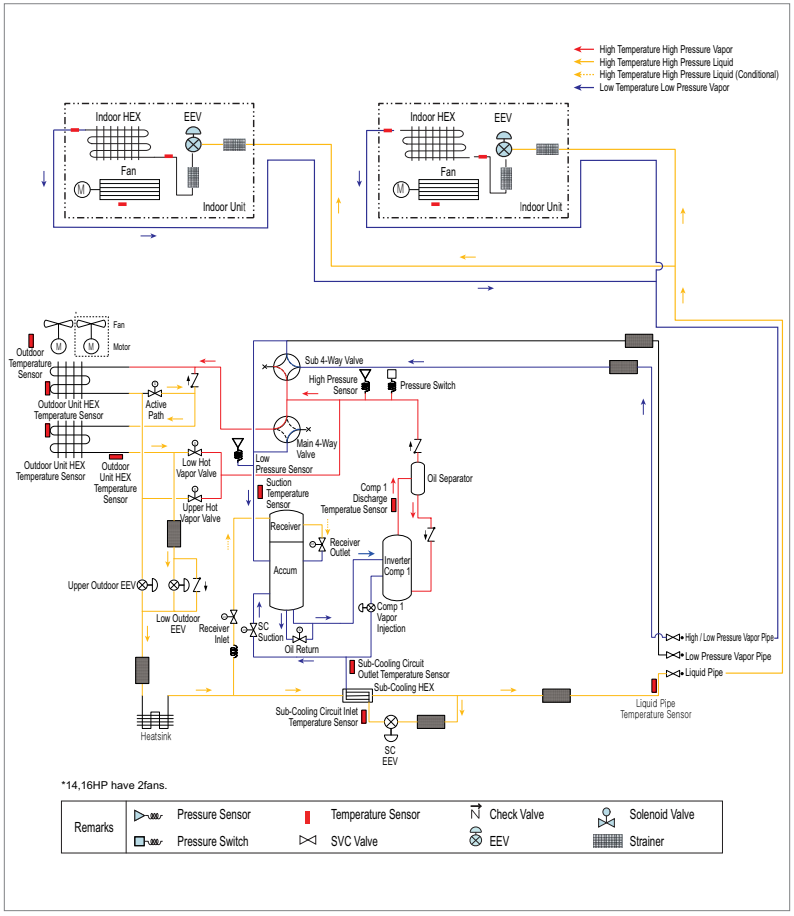


■ Low HEX Defrost Operation

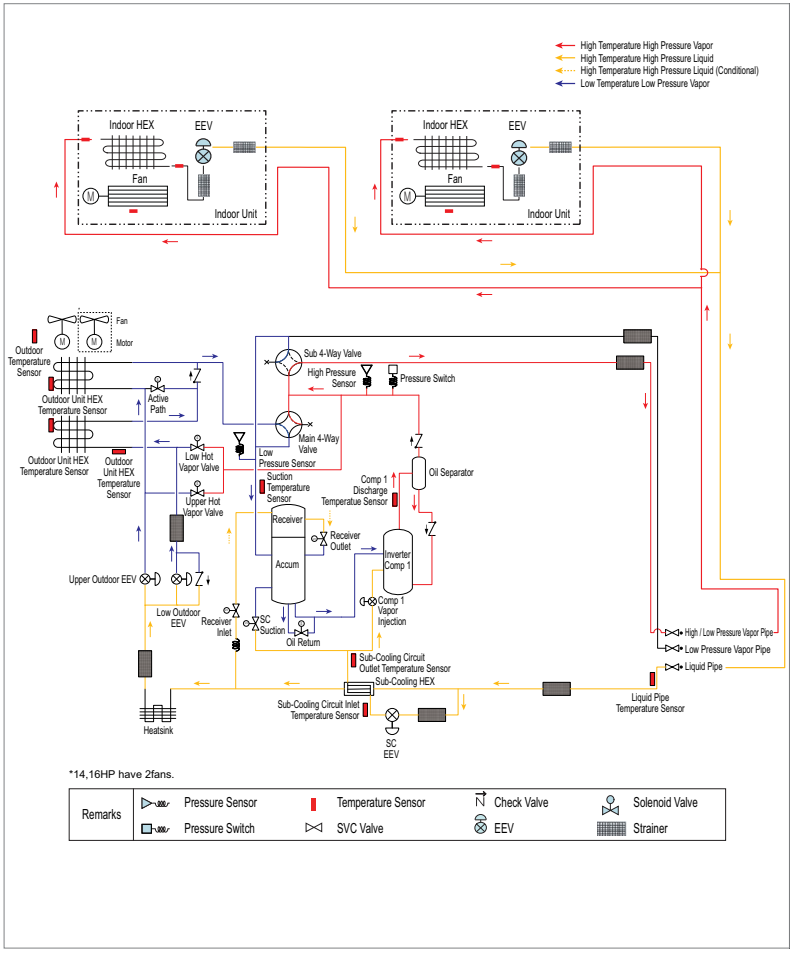


Heat Pump System

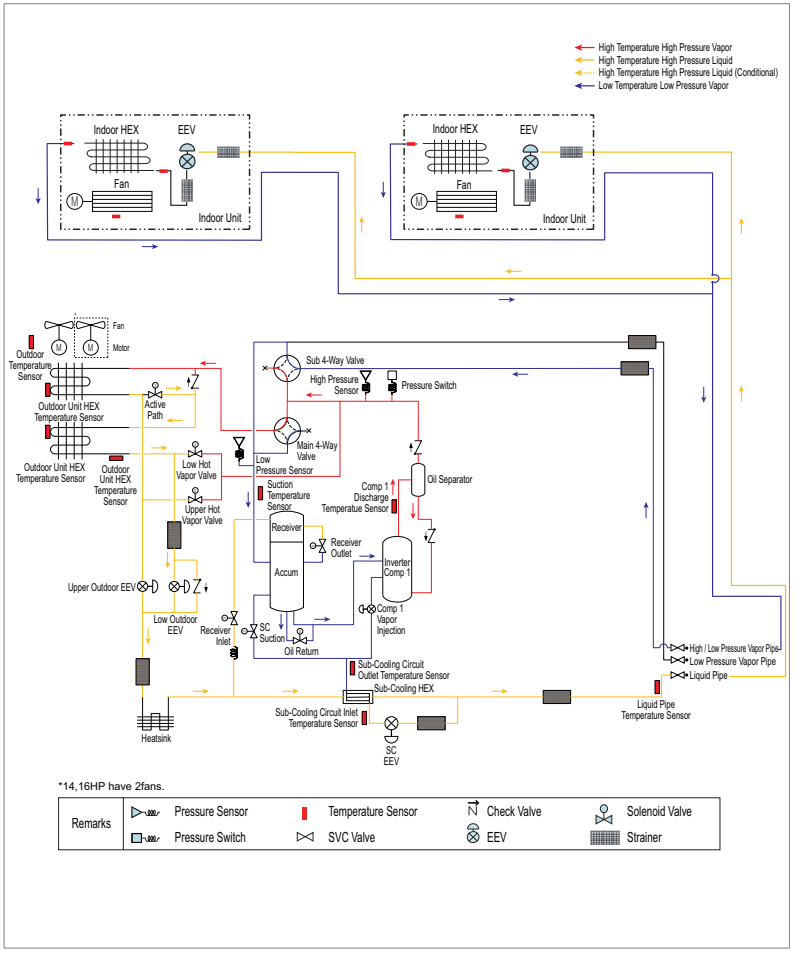
■ Cooling Operation



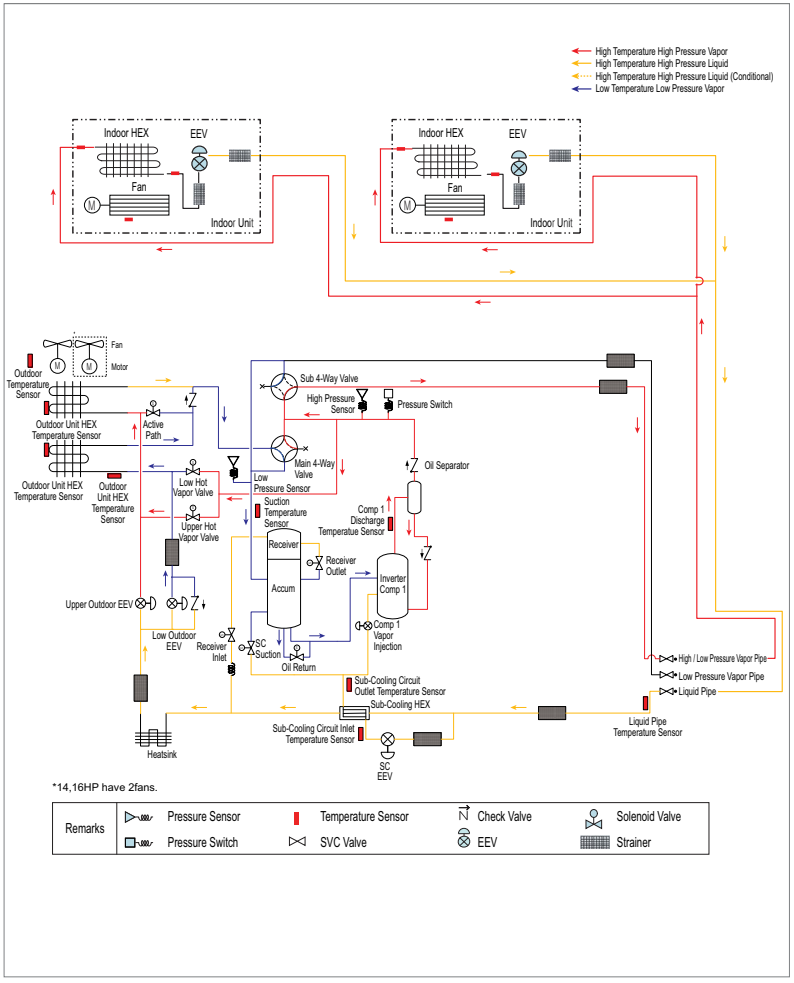
■ Heating Operation



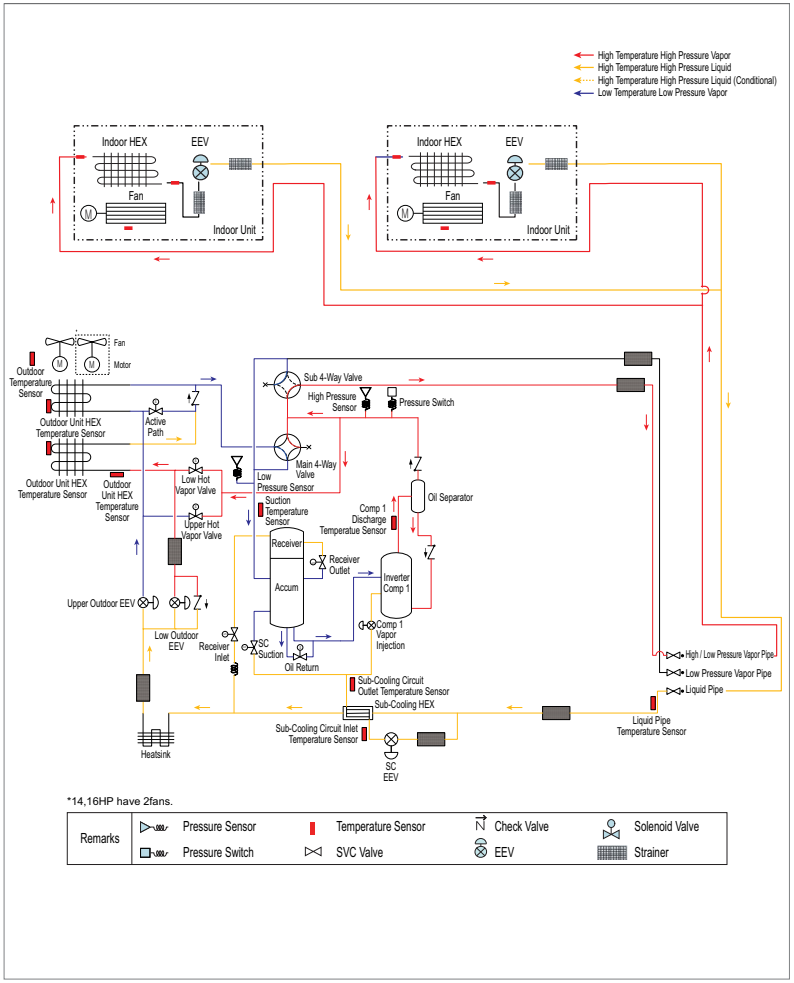
■ Oil Return/ Defrost Operation



■ Upper HEX Defrost Operation



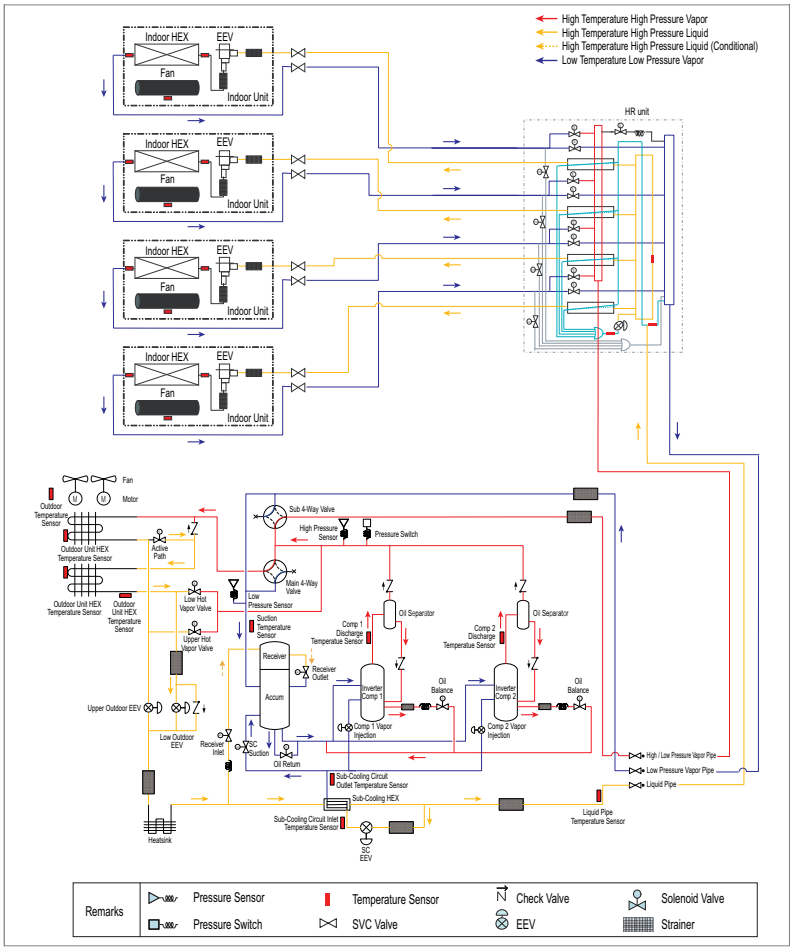
■ Low HEX Defrost Operation



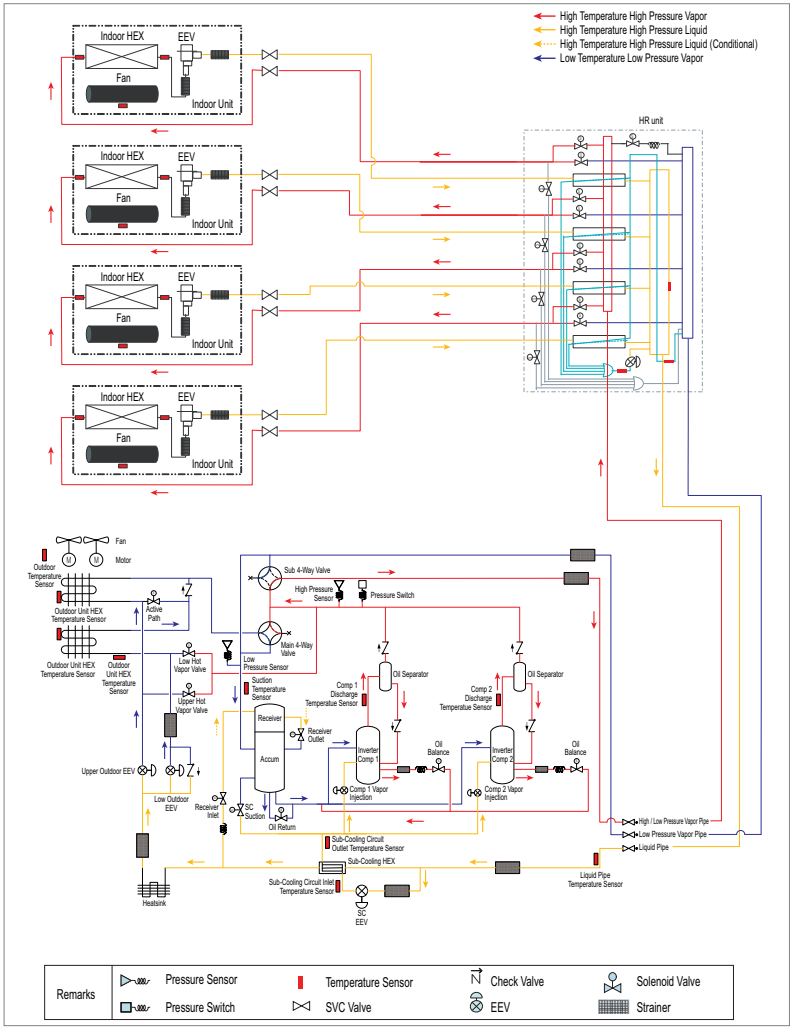
18 / 20 / 22 / 24 / 26HP (2 Comp)

Heat Recovery System

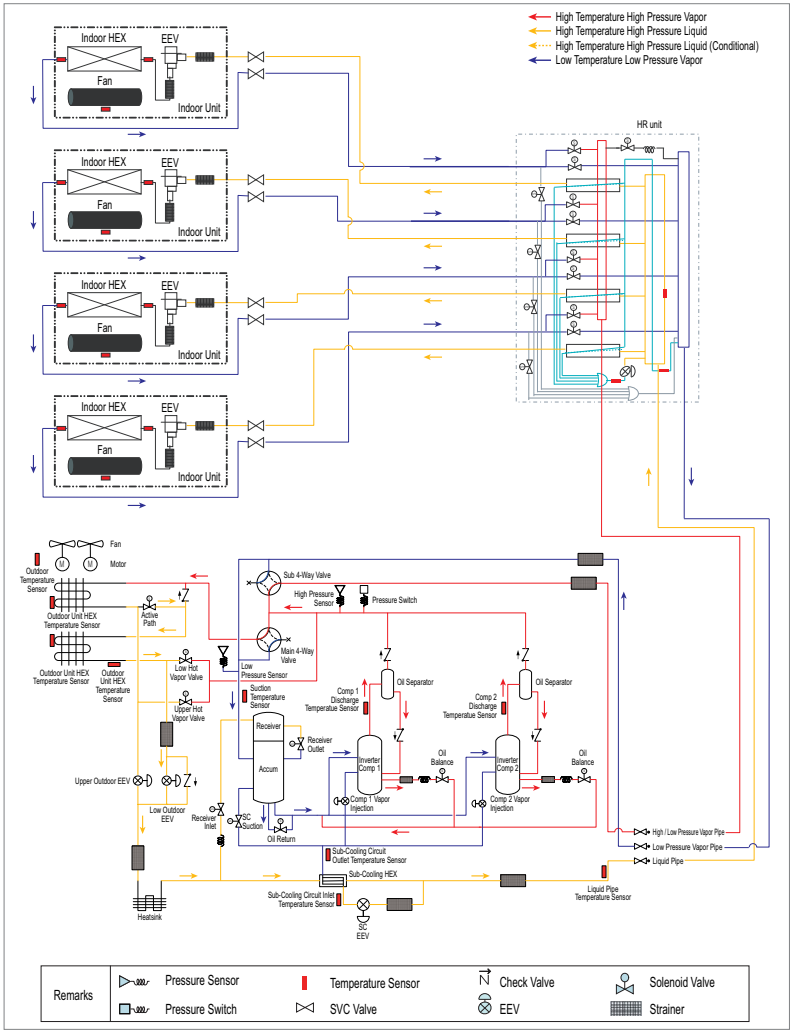
■ Cooling Operation



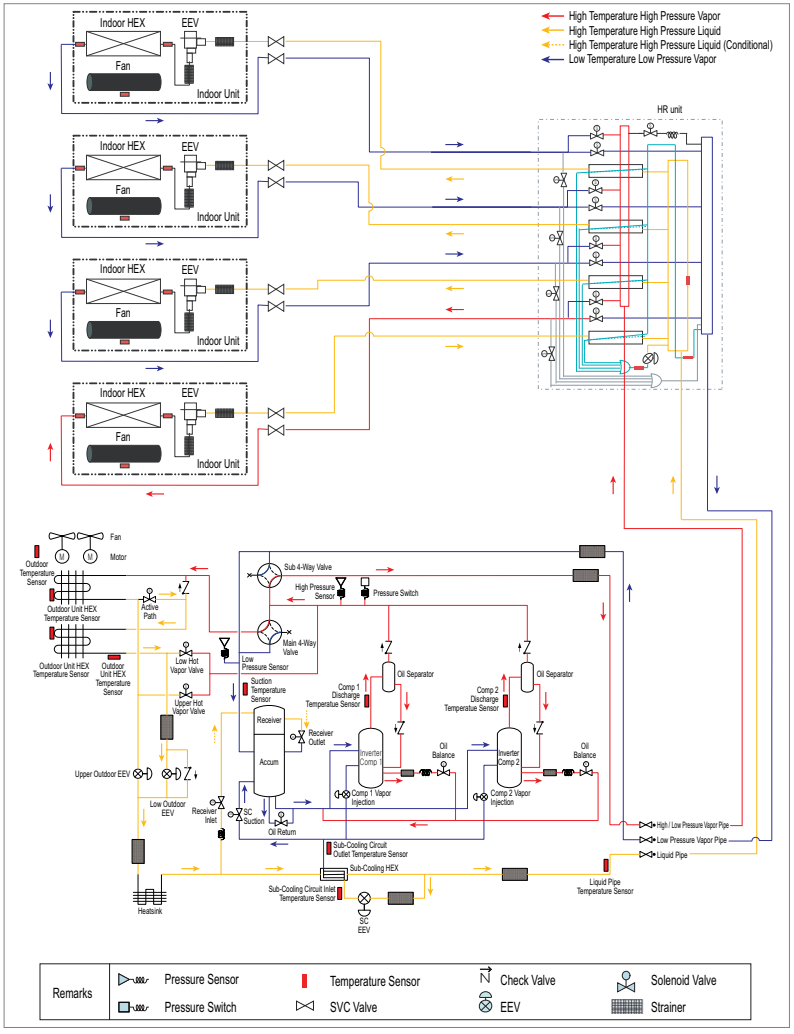
■ Heating Operation



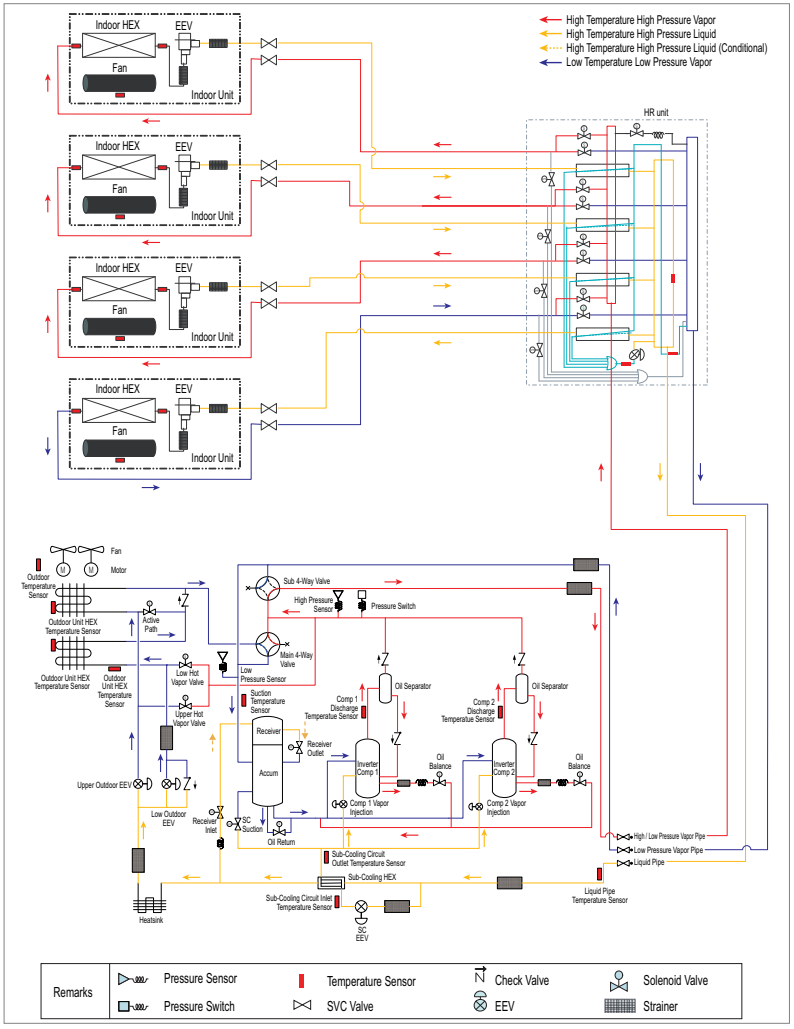
■ Oil Return/ Defrost Operation



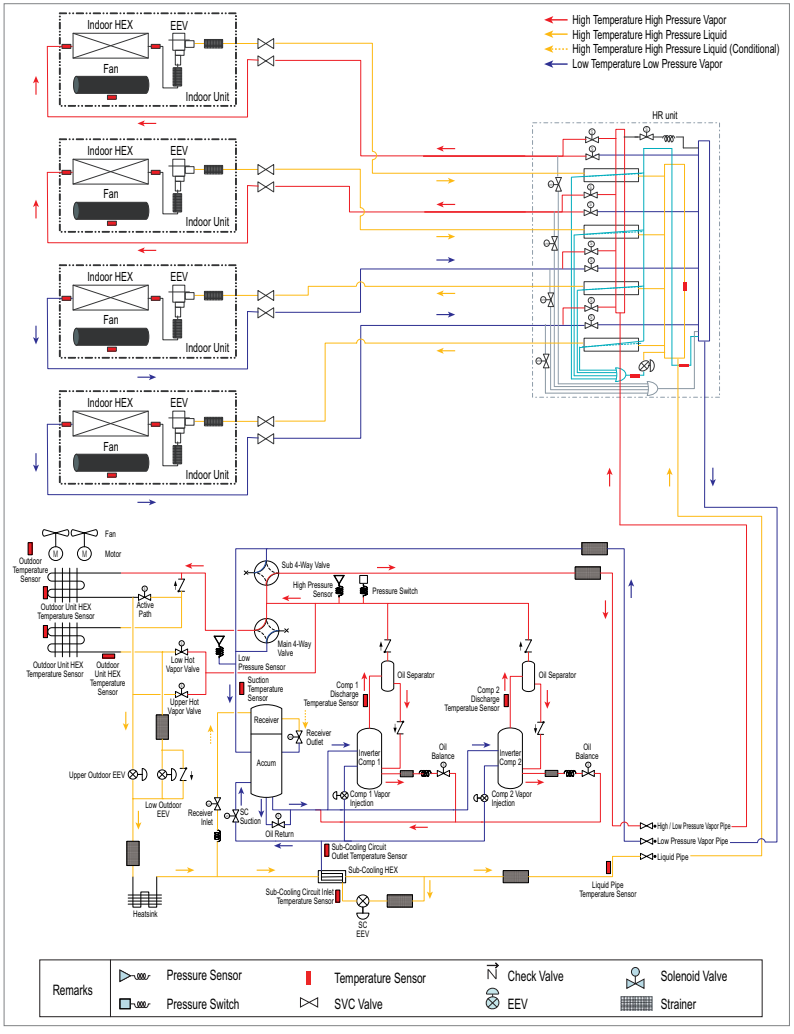
■ Cooling-based Simultaneous Operation



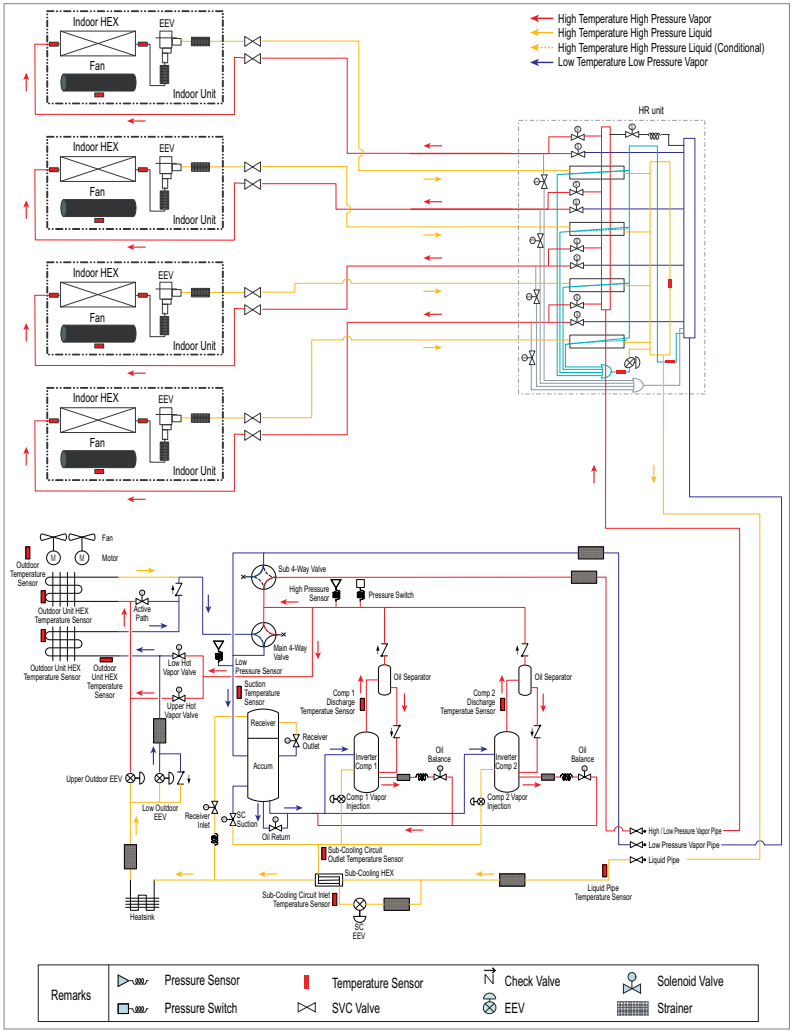
■ Heating-based Simultaneous Operation



■ Balanced Simultaneous Operation



■ Upper HEX Defrost Operation



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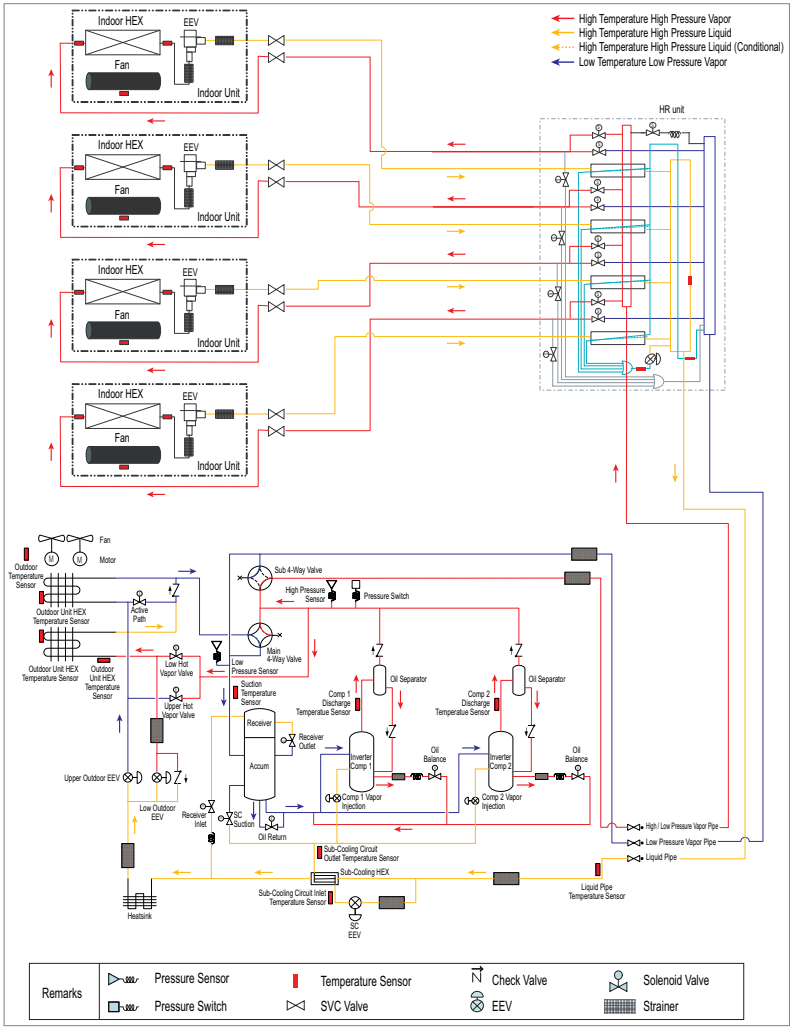
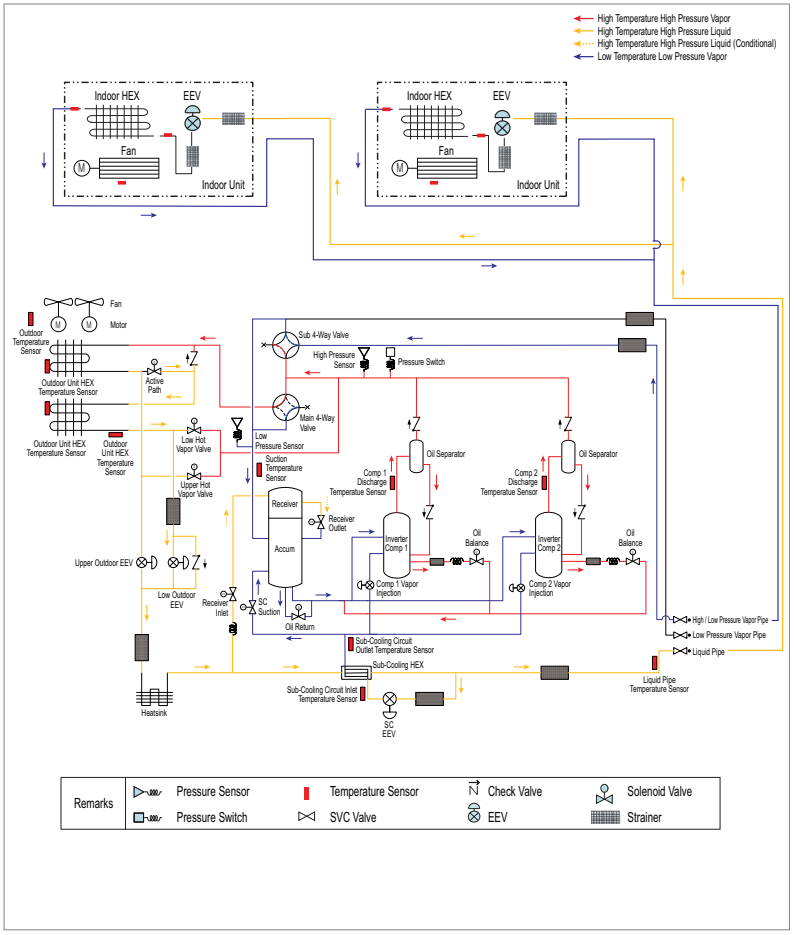
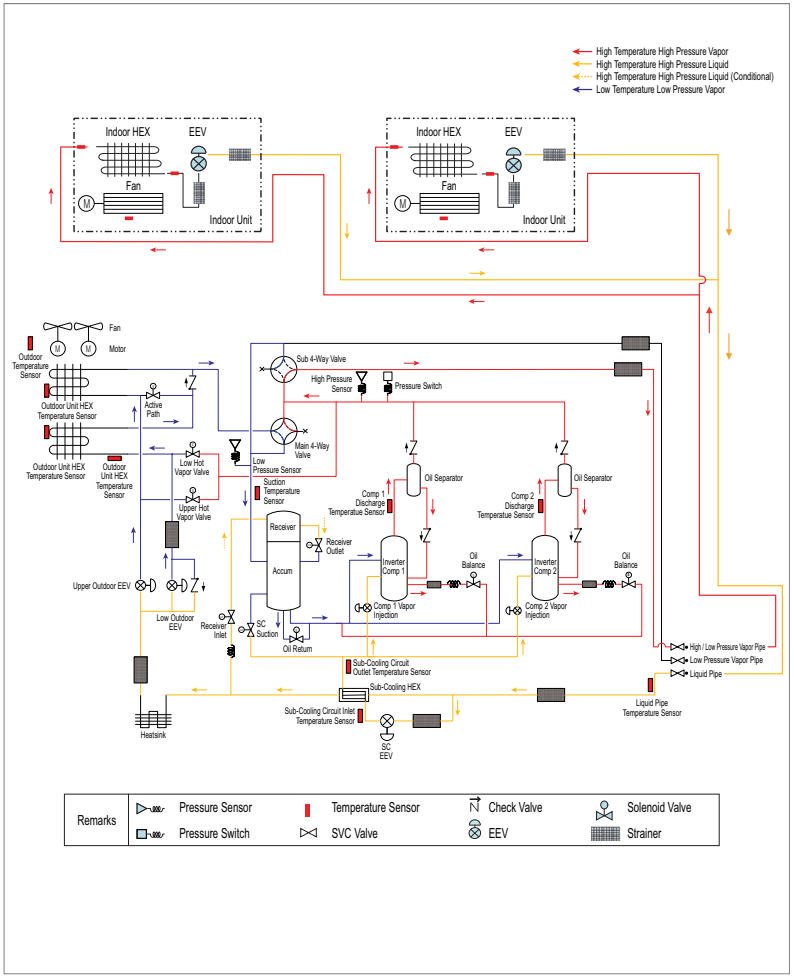


Heat Pump System

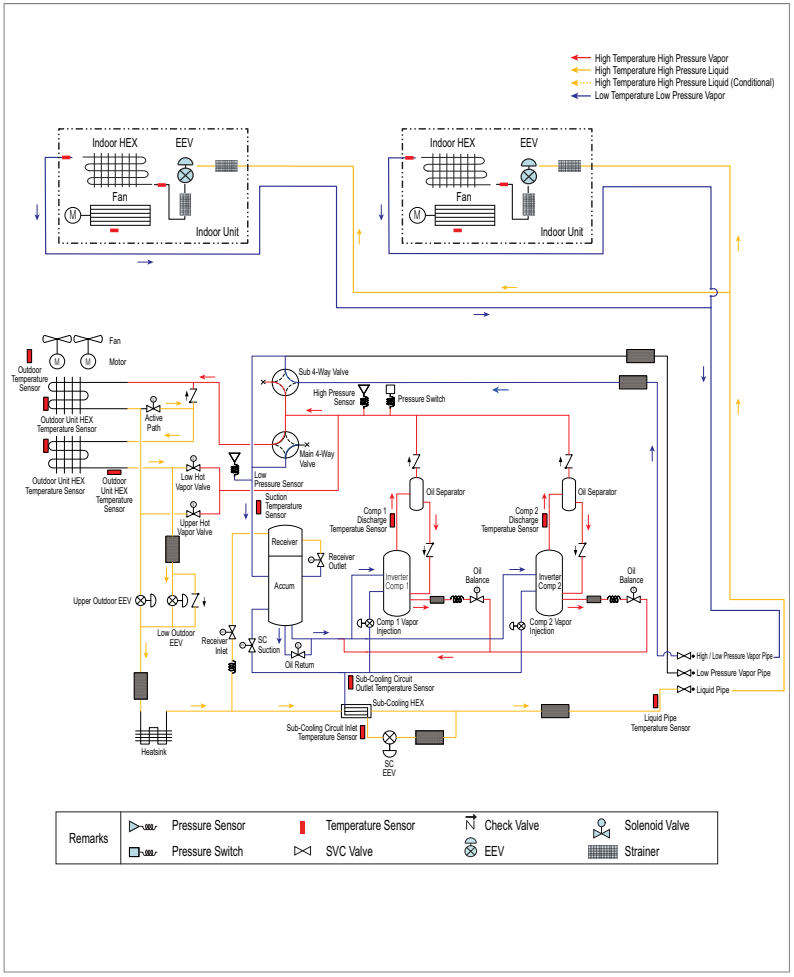
■ Cooling Operation



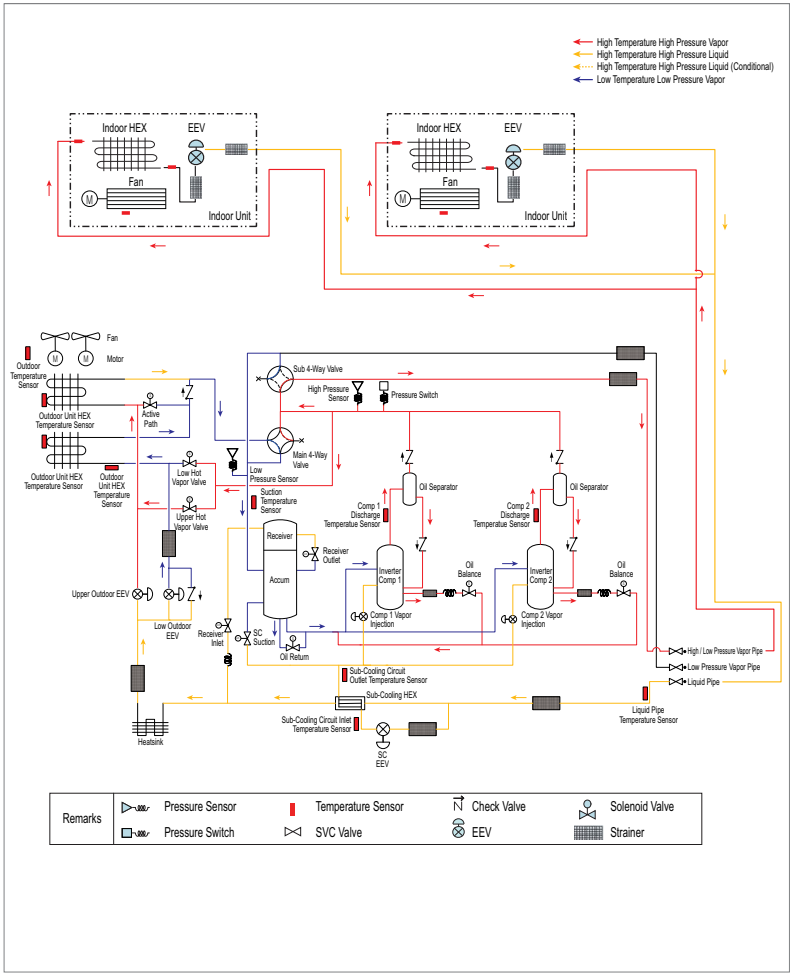
■ Heating Operation



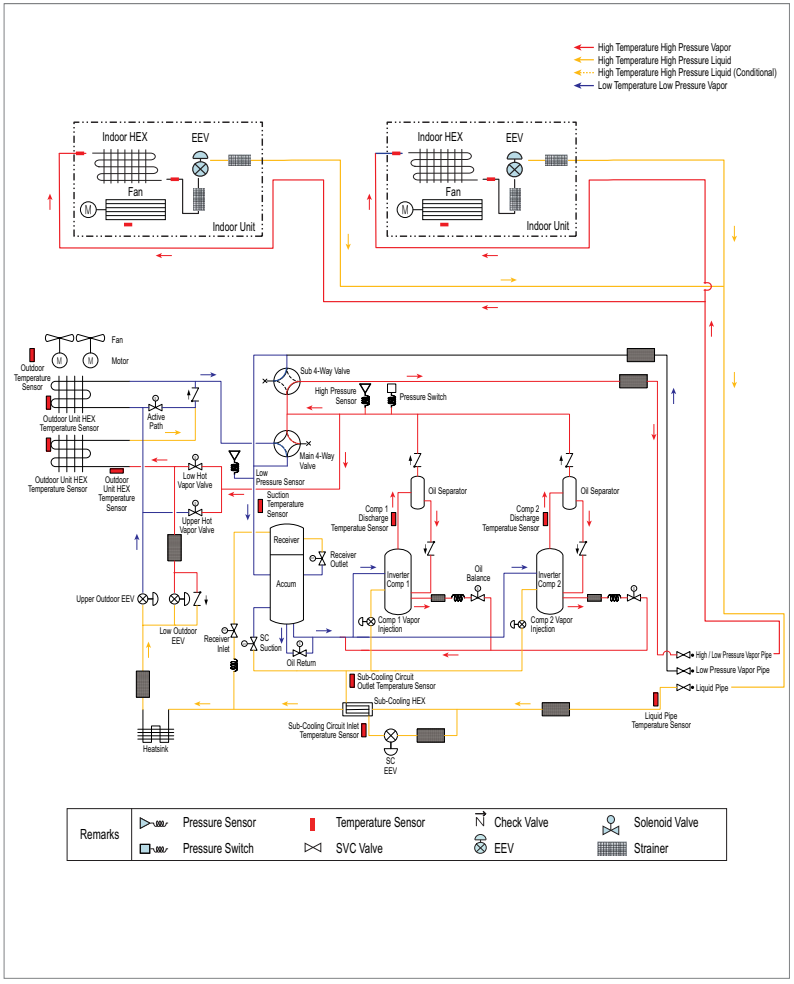
■ Oil Return/ Defrost Operation



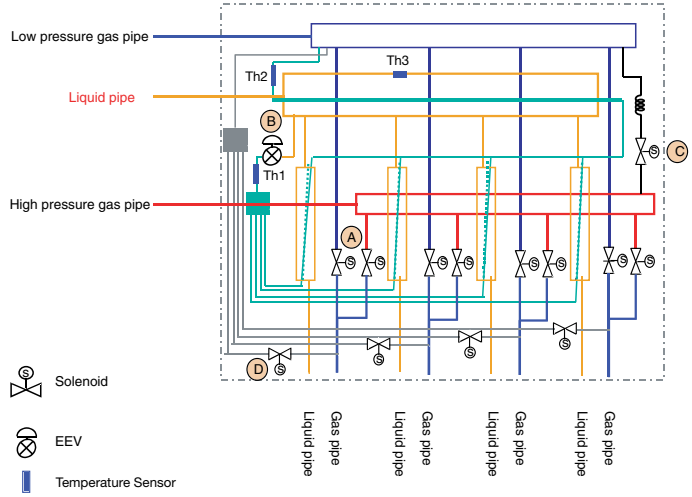
■ Upper HEX Defrost Operation



■ Low HEX Defrost Operation



HR Unit



Symbol	Description	PCB Connector
Th1	Sub Cooling In Temperature Sensor	SN_SEN_02(SC_IN)
Th2	Sub Cooling Out Temperature Sensor	SN_SEN_02(SC_OUT)
Th3	Luquid Receiver Temperature Sensor	SN_SEN_02(LIQUID)

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

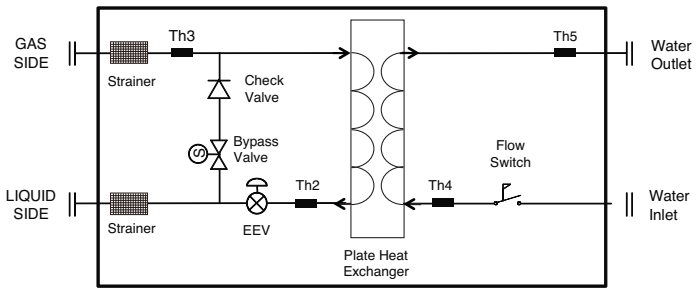
Ⓑ : To be used decreasing noise according to sub-cooling of inlet and outlet of indoor unit (Simultaneous operation)

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

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

Hydro Kit

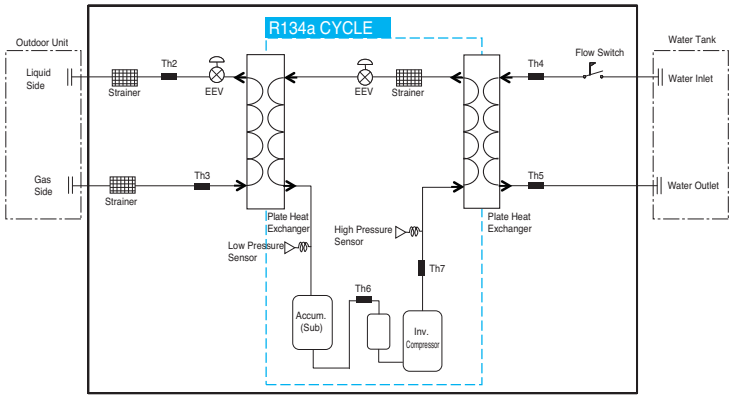
1. Medium Temperature



Symbol	Description	PCB Connector	Remarks
Th1	Air Temperature Sensor	CN-ROOM	*Optional accessory (being sold separately) *Not shown in diagram
Th2	Liquid Side Temperature Sensor	CN-PIPE/IN	
Th3	Gas Side Temperature Sensor	CN-PIPE/OUT	
Th4	Water Inlet Temperature Sensor	CN-TH3	*Th4 and Th5 are connected to 4 pin type connector CN-TH3
Th5	Water Outlet Temperature Sensor		

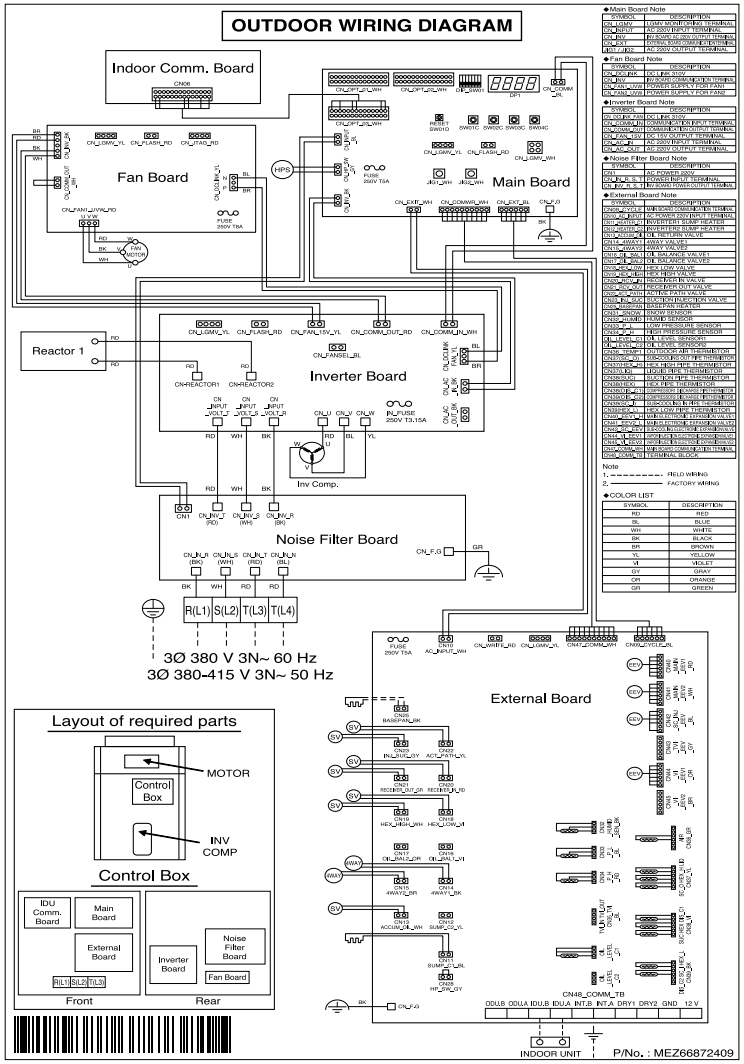
2. High Temperature

Hydro Kit (For High Temperature)

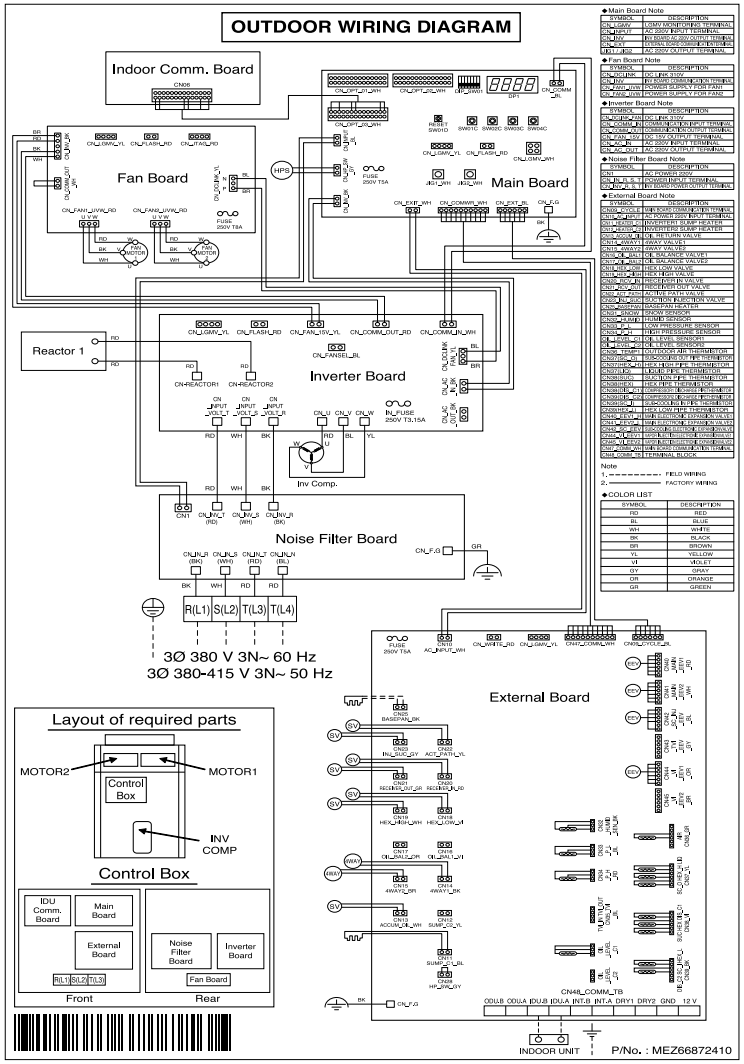


Symbol	Description	PCB Connector	Remarks
Th1	Air Temperature Sensor	CN-ROOM (Main PCB)	*Optional accessory (being sold separately) *Not shown in diagram
Th2	Liquid Side Temperature Sensor	CN-PIPE/IN (Main PCB)	
Th3	Gas Side Temperature Sensor	CN-PIPE/OUT (Main PCB)	
Th4	Water Inlet Temperature Sensor	CN-TH3 (Main PCB)	*Th4 and Th5 are connected to 4 pin type connector CN-TH3(Black)
Th5	Water Outlet Temperature Sensor		
Th6	Suction Pipe Temperature Sensor	CN-TH3 (Inverter PCB)	* Th6 and Th7 are connected to 4 pin type connector CN-TH3(Red)
Th7	Discharge Pipe Temperature Sensor		
Th8	Inside Air Temperature Sensor	CN-TH2 (Inverter PCB)	*Not shown in diagram

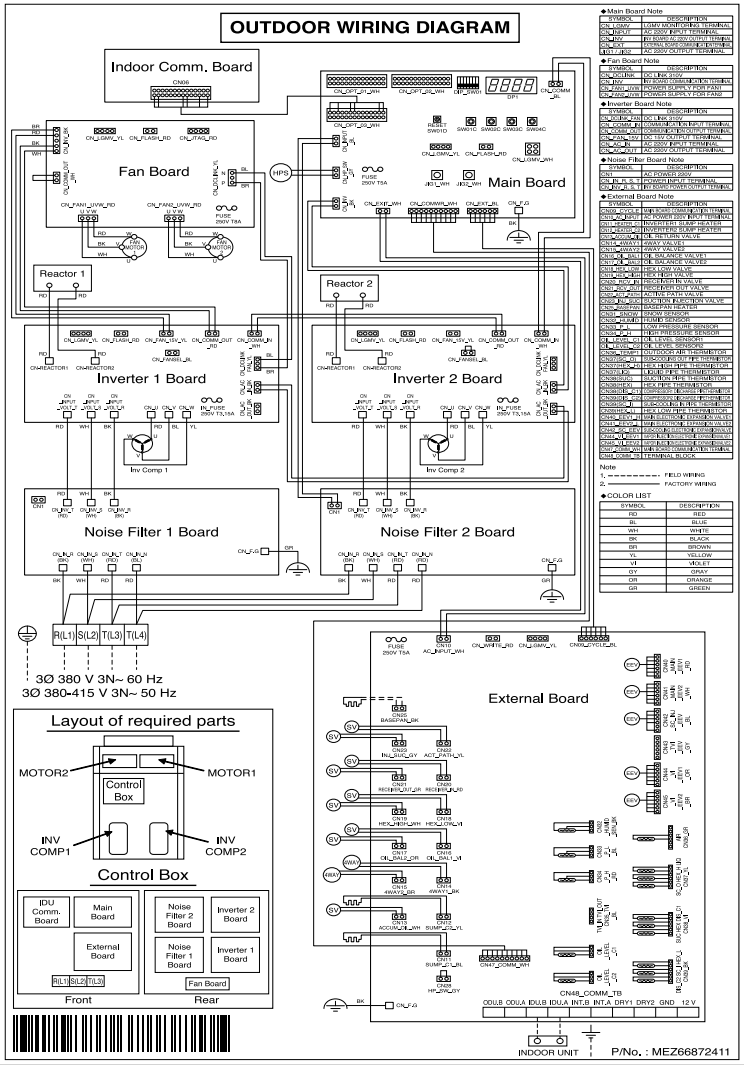
4.1 8 / 10 / 12 HP (UXA, 1 Comp)



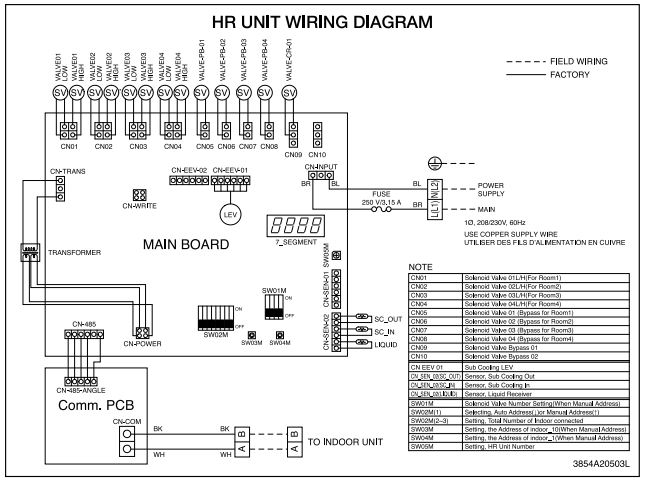
14 / 16 HP (UXB, 1 Comp)



18 / 20 / 22 / 24 / 26HP (UXB, 2 Comp)



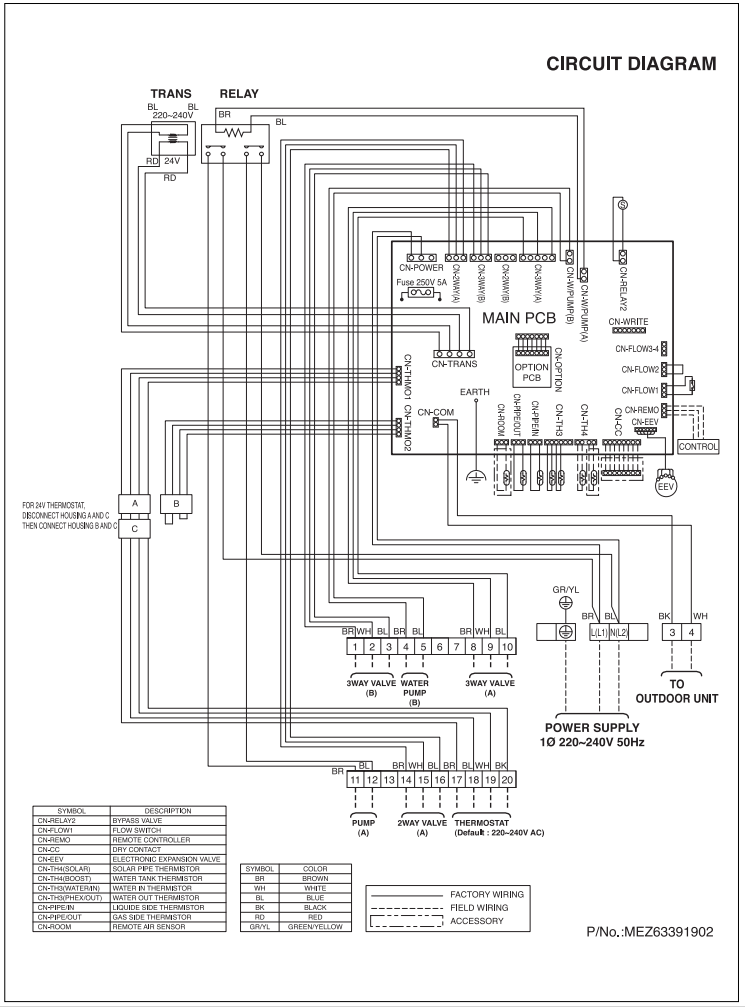
HR Units



CN01	Solenoid Valv 01 L/H(For Room1)
CN02	Solenoid Valv 02 L/H(For Room2)
CN03	Solenoid Valv 03 L/H(For Room3)
CN04	Solenoid Valv 04 L/H(For Room4)
CN05	Solenoid Valv 01 L/H(Bypass for Room1)
CN06	Solenoid Valv 02 L/H(Bypass for Room2)
CN07	Solenoid Valv 03 L/H(Bypass for Room3)
CN08	Solenoid Valv 04 L/H(Bypass for Room4)
CN09	Solenoid Valv Bypass 01
CN10	Solenoid Valv Bypass 02
CN EEV 01	Sub Cooling LEV
CN_WEN_02(SC_OUT)	Sensor, Sub Cooling Out
CN_WEN_02(SC_IN)	Sensor, Sub Cooling In
CN_WEN_02(LIQUID)	Sensor, Liquid Receiver
SW01M	Solenoid Valve Number Setting(When Manual Address)
SW02M(1)	Selecting, Auto Address(↓) or Manual Address(↑)
SW02M(2~3)	Setting, Total Number of Indoor connected
SW03M	Setting, the Address of indoor_10(When Manual Address)
SW04M	Setting, the Address of indoor_1(When Manual Address)
SW05M	Setting, HR Unit Number

Hydro Kit

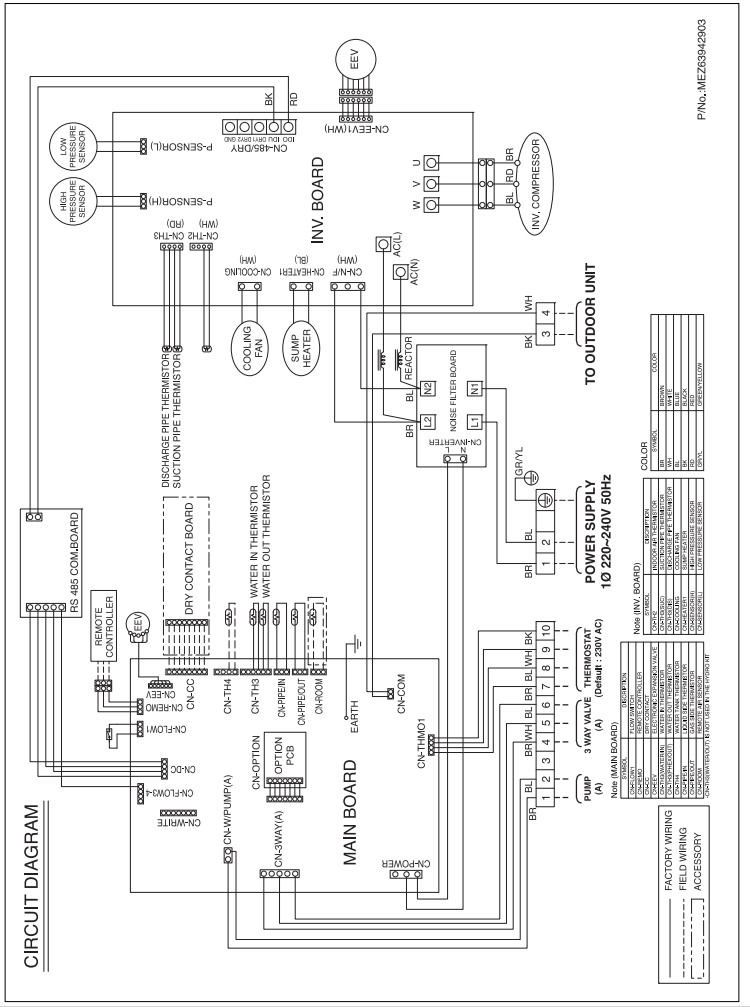
1. Medium Temperature



SYMBOL	DESCRIPTION
CN-RELAY2	BYPASS VALVE
CN-FLOW1	FLOW SWITCH
CN-REMO	REMOTE CONTROLLER
CN-CC	DRY CONTACT
CN-EEV	ELECTRONIC EXPANSION VALVE
CN-TH4(SOLAR)	SOLAR PIPE THERMISTOR
CN-TH4(BOOST)	WATER TANK THERMISTOR
CN-TH3(WATERIN)	WATER IN THERMISTOR
CN-TH3(PHEX/OUT)	WATER OUT THERMISTOR
CN-PIPE/IN	LIQUIDE SIDE THERMISTOR
CN-PIPE/OUT	GAS SIDE THERMISTOR
CN-ROOM	REMOTE AIR SENSOR

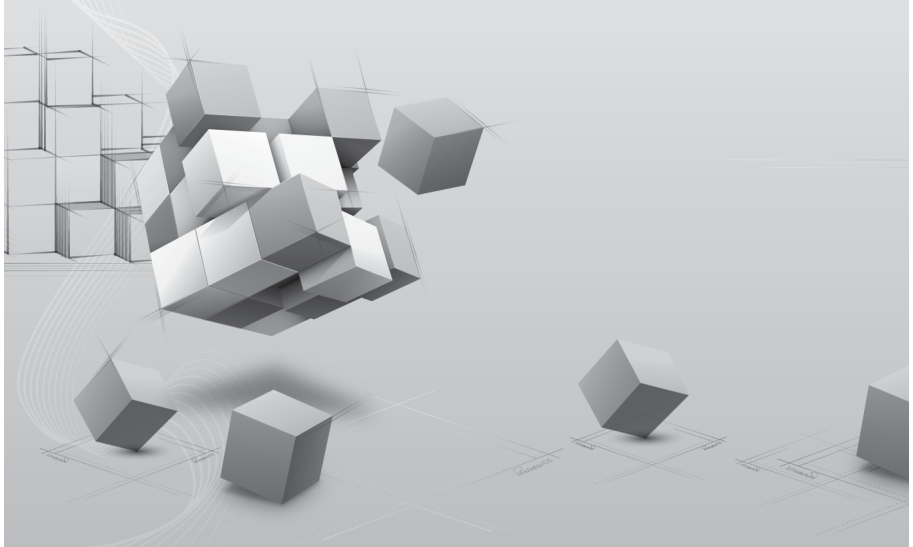
SYMBOL	COLOR
BR	BROWN
WH	WHITE
BL	BLUE
BK	BLACK
RD	RED
GR/YL	GREEN/YELLOW

2. High Temperature



MULTI V 5

Ⅲ. Trouble Shooting Guide



MULTI V 5

Ⅲ. Trouble Shooting Guide

Checking Point

1. LGMV

Mode	No.	Item	Unit	R410a Normal condition	R410a Abnormal condition	Cause & Check Point
Cooling	1	High Pressure	kPa	2000~3600	Above 3800	Overcharging, Outdoor Fan lock
					Below 1800	Ref. Leakage or Ref. Shortage
	2	Low Pressure (Cooling)	kPa	500~1000	Above 1300	Overcharging
					Below 400	Ref. Leakage or Ref. Shortage, Comm Line Wrong connection
	3	Indoor EEV	Pulse	200~600	Above 1000	Ref. Leakage or Ref. Shortage
					Below 100	Overcharging, Indoor Pipe Temp. Sensor Defect
	4	Outdoor EEV	Pulse	32/2000(Normal)	–	Normal Mode : Upper EEV → full close Lower EEV → full open
				2000/32 (Cooling low temp.)		Low Temp Mode : Upper EEV → full open Lower EEV → full close
	5	Indoor pipe ΔT ΔT = Outlet – Inlet	℃	0~10	Below –1	Below 0℃ : EEV leakage, Malfunction Above 10℃ : EEV clogging, Malfunction, Pipe Clogging, Wrong Piping
	6	Indoor pipe Inlet, Outlet	℃	6~15	above 17	Ref. Leakage or Ref. Shortage Indoor Path Clogging EEV Fault, Indoor Pipe Temp. Sensor Defect
Heating	7	High Pressure (Cooling)	kPa	2300~3300	Above 3400	Overcharging, Comm Line Wrong connection Indoor Fan Lock
					below 2200	Ref. Leakage or Ref. Shortage
	8	Low Pressure	kPa	200~1200	Above 1300	Overcharging
					below 120	Ref. Leakage or Ref. Shortage, Outdoor EEV Fault
	9	Indoor EEV	Pulse	150~1350	–	
	10	Outdoor EEV	Pulse	200~800	Above 1500	Ref. Leakage or Ref. Shortage
					Below 150	Overcharging
Common	11	Comp. Discharge T	℃	60~100	Above 105	Ref. Leakage or Ref. Shortage
	12	Suction Superheat (Tsuc–Tdew)	℃	Above 0.5	below 0	SC EEV Fault, Overcharging EEV Fault
	13	Discharge Superheat (Tdis–Tbub)	℃	Above 15	Below 5	SC EEV Fault, Overcharging

– The value of LGMV in steady–state condition after driving more than 80% of the indoor unit
– The above value is not the absolute value, it can be changed according to the installation environment and operating condition.
– The above causes are the most common causes, there can be other possible causes.

2. Lack of Cooling

2.1 Not reach target low pressure

Checking Item	Symptom	Judgment	Countermeasure
Inlet temp. of indoor unit	≥ 14 ℃	Refrigerant shortage	Check the indoor EEV opening pulse. When the opening pulse is small or closed, please lower the degree of superheat of the corresponding indoor unit
			Check the indoor unit EEV
			Check the liquid pipe blocking or the foreign sub–stances in the strainer.
			Check indoor unit with bypass flow (Confirm total flow while changing full / partial / single operation)
The degree of superheat of indoor unit	≥ 5 ℃	Cooling overload	Recheck the load design, Check the ambient air flow, (if duct type) inlet / outlet chamber installation
		Refrigerant shortage	Check the amount of refrigerant
		Defective temp. sensor of indoor unit	Check the temperature sensor of indoor unit
		Defective EEV of indoor unit	Check the indoor unit EEV
	Discharge temp. is normal under full operation but discharge temp. is abnormal under partial operation	Bypass on indoor flow	If the liquid pipe and the gas pipe are connected to a place without an indoor unit, separate the con–nected pipe.

※ **the inlet temperature of the indoor unit** : When the present low pressure reaches the target low pres–sure, the inlet temperature of the indoor unit should be not more than evaporation temperature + 10 ℃
※ **The degree of superheat of indoor unit (It may be different depending on the outdoor unit control)**
> 2 ℃ : EEV Open
< 2 ℃ : EEV Close

2.2 Not reach target low pressure

Checking Item	Symptom	Judgment	Countermeasure
Comp. max Hz operation	Not reach the target low pressure under full / partial / single operation	Bypass by defective outdoor valve	Check the outdoor valve
	Not reach the target low pressure under full operation, but reach the target low pressure under partial operation	Lack of outdoors capacity	
Not max Hz operation		Compressor protection control operation	
Fan. max RPM operation	Compressor operation limit by excessive high pressure drop	High outdoor temperature	
		Defective installation of outdoor unit	Check the outdoor installation environment
		Excessive foreign substance of outdoor heat exchanger	Remove the foreign substance
Not max. RPM operation	Not reach max. RPM under max. RPM display on the LGMV	Difective of fan motor, motor shaft, fan fixing screw, fan balance and fan breakage	
		Fan heatsink temperature limit	Check the amount of thermal grease between the fan PCB and the heat sink.
		Fan lock	Remove foreign substance around the fan operation.

※ **Compressor operation** : The compressor controls the Hz to reach the target low pressure during the cooling operation.
- If the compressor does not reach the target low pressure while the compressor is operating at Max. Hz, the outdoor capacity is insufficient compared to the indoor load or the flow is bypassed.
- If the compressor is not in Max Hz operation, it is in emergency control to limit compressor operation.

※ **Fan operation** : During cooling operation, the fan controls the RPM to match the target high pressure.
- If the present high pressure is higher than the target high pressure, the RPM is raised.
- If the present high pressure is lower than the target high pressure, the RPM is decreased.

3. Lack of Heating

3.1 Reach target high pressure

Checking Item	Symptom	Judgment	Countermeasure
The degree of subcooling of indoor unit	≥ 10 ℃	Refrigerant overcharging	Check the amount of refrigerant
		Heating overload	Recheck the load design, Check the ambient air flow, (if duct type) inlet / outlet chamber installation
		Defective temp. sensor of indoor unit	Check the temperature sensor of indoor unit
		Defective EEV of indoor unit	Check the indoor unit EEV
		Defective installation of indoor unit	Check the indoor installation environment

※ **The degree of subcooling of indoor unit (It may be different depending on the outdoor unit control)**
> 5 ℃ : EEV Open
< 5 ℃ : EEV Close

3.2 Not reach target high pressure

Checking Item	Symptom	Judgment	Countermeasure
Comp. max Hz operation	Not reach the target low pressure under full / partial / single operation	Bypass by defective outdoor valve	Check the outdoor valve
	Not reach the target high pressure under full operation, but reach the target low pressure under partial operation	Lack of outdoors capacity	
Not max Hz operation		Compressor protection control operation	
	Excessive low pressure drop	Heating low pressure control operation	
Fan. max RPM operation	Compressor operation limit by excessive low pressure drop	Low outdoor tem–perature	
		Defective installation of outdoor unit	Check the outdoor installation environ–ment
		Excessive foreign sub–stance of outdoor heat exchanger	Remove the foreign substance
Not max. RPM operation	Not reach max. RPM under max. RPM display on the LGMV	Difective of fan motor, motor shaft, fan fixing screw, fan balance and fan breakage	
		Fan heatsink tempera–ture limit	Check the amount of thermal grease between the fan PCB and the heat sink.
		Fan lock	Remove foreign substance around the fan operation.

※ **Compressor operation** : The compressor controls the Hz to reach the target high pressure during the heating operation.
- – If the compressor does not reach the target high pressure while the compressor is operating at Max. Hz, the outdoor capacity is insufficient compared to the indoor load or excessive low outdoor temp. the flow is bypassed.
- – If the compressor is not in Max Hz operation, it is in emergency control to limit compressor operation.

※ **Fan operation** : During heating operation, the fan controls the RPM to match the target low pressure.
- – If the present low pressure is lower than the target low pressure, the RPM is raised.
- – If the present low pressure is lower than the target low pressure, the RPM is decreased.

4. Check The Amount of Refrigerant

4.1 Cooling

Item	Refrigerant shortage	Refrigerant overcharging
Indoor unit EEV	• EEV open (approx. 400 pls or more) • Refrigerant noise	EEV close (approx. 150 pls or less)
The degree of superheat (@ indoor unit) (Pipeout Temp. – Pipein Temp.)	above 5 ℃	below 0 ℃
Low pressure	below target low pressure	above target low pressure
High pressure	below target high pressure	High pressure limit * Even if the compressor Hz is low, easily increase high pressure)
The degree of subcooling (@ outdoor unit)	• below 5 ℃ (@ single operation) • below 10 ℃ (@ full operation)	• below 25 ℃ (@ single operation) • below 20 ℃ (@ full operation)
Inverter discharge temperature	high	low
The degree of suction superheat	above target degree	below target degree

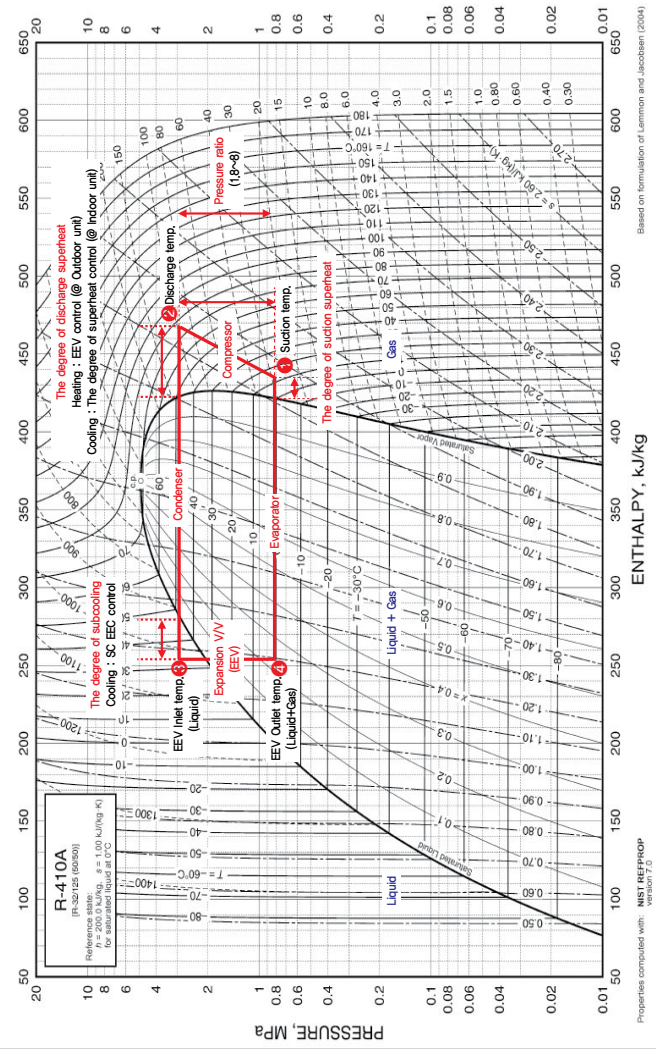
※ The table above is not an absolute measure of the amount of refrigerant. Please judge comprehensively with other factors.

4.2 Heating

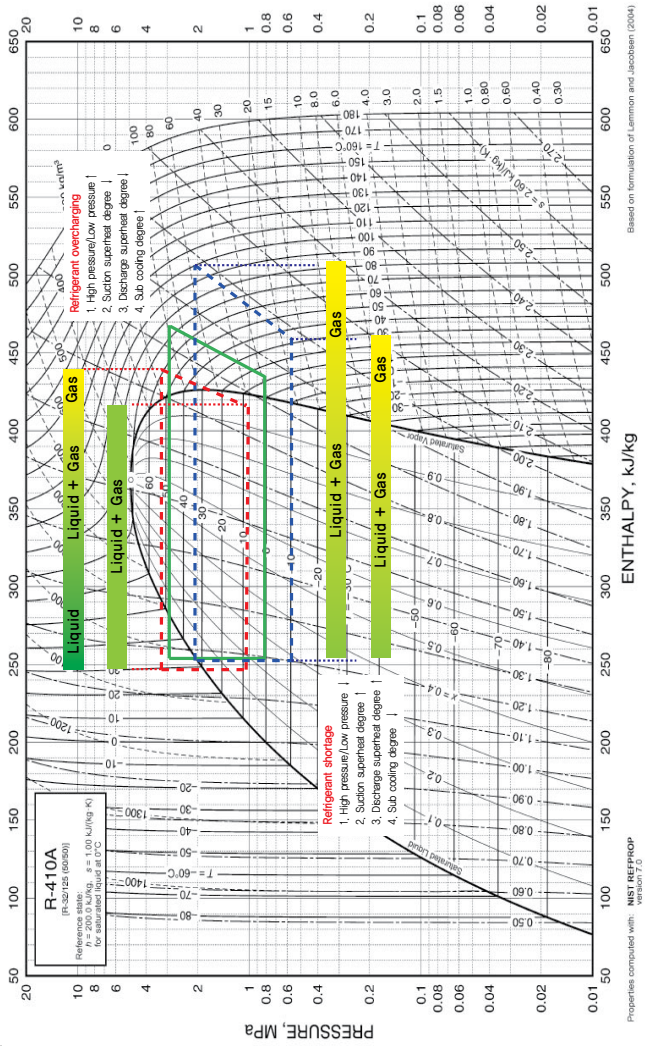
Item	Refrigerant shortage	Refrigerant overcharging
Indoor unit EEV	EEV close (approx. 200 pls or less)	EEV open (approx. 1350 pls)
The degree of subcooling (@ indoor unit) (Condense Temp. – Pipein Temp.)	below 3 ℃	above 7 ℃
Low pressure	below target low pressure	above target low pressure
High pressure	Low pressure limit	High pressure limit * Even if the compressor Hz is low, easily increase high pressure
Inverter discharge temperature	high (approx. 100 ℃ or more) * If the compressor Hz is low, the temperature may be low even if the refrigerant is insufficient)	low * But not always low, depending on the cycle)
The degree of suction superheat	above target degree	below target degree

※ The table above is not an absolute measure of the amount of refrigerant.
Please judge comprehensively with other factors.

4.3 Normal cycle



4.4 Abnormal cycle (Refrigerant Overcharging / Shortage)



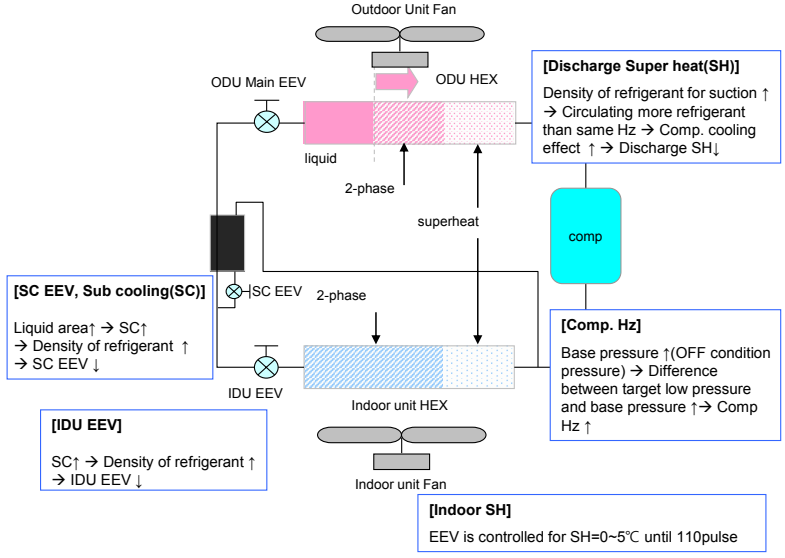
5. Cycle Changes by amount of refrigerant

5.1 Cooling cycle

5.1.1 A cycle changes by refrigerant overcharging

When overcharging a refrigerant more than necessary, an extra refrigerant will be stored in condensing HEX and liquid pipe because of high density. Overcharged refrigerant can make changing the cycle as below.
To make clear distinction, all IDU's should be operated, and wait at least 20 minutes after system started until cycle is stabilized

- ODU HEX
  : Accumulation of refrigerant in condensing area → Increasing liquid area (SC ↑)
  → Performance ↓ → High Pressure ↑
- ODU Fan
  : RPM ↑ to reduce high pressure



* In case of refrigerant shortage, cycle will show opposite response.

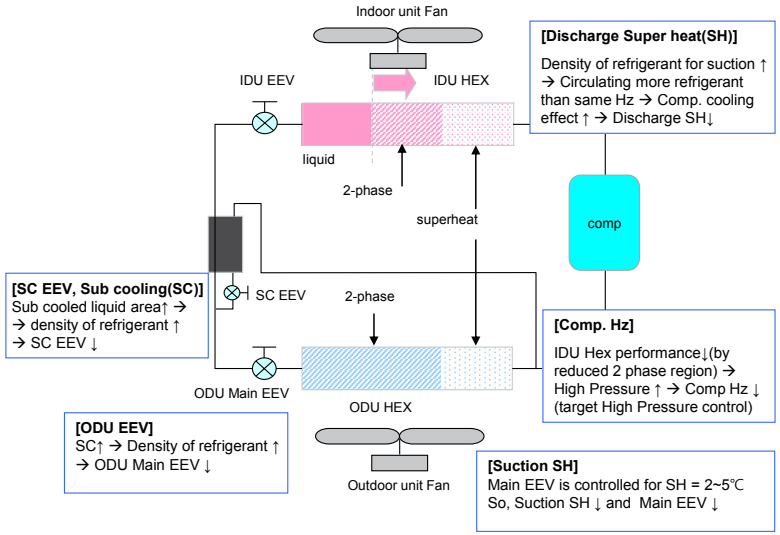
5.2 Heating cycle

5.2.1 A cycle changes by refrigerant overcharging

When overcharging a refrigerant more than necessary, an extra refrigerant will be stored in condensing HEX and liquid pipe because of high density. Overcharged refrigerant can make changing the cycle as below.
To make clear distinction, all IDU's should be operated, and wait at least 20 minutes after system started until cycle is stabilized

- ODU HEX
  : Accumulation of refrigerant in condensing area → Increasing liquid area (SC ↑)
  → Performance ↓ → High Pressure ↑
- ODU EEV
  : EEV pulse ↑ for decreasing sub-cooling

* in some cases, mal-distribution of ref. among indoor units causes lack of ref. supply to specific IDUs, thus EEV pulse can be increased regardless of ref. conditions



* In case of refrigerant shortage, cycle will show opposite response.

MULTI V 5

III. Trouble Shooting Guide

Self-Diagnosis Function

1. Error Code Display

Self-Diagnosis Function

Error Indicator

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

Error Display

1st,2nd,3rd LED of 7-segment indicates error number, 4th LED indicates unit number.(* = 1: Master, 2: Slave 1, 3: Slave 2, 4: Slave 3)

Ex) 1051 : Error occurrence with error number 105 at No. 1 outdoor unit (=Master unit)
In case of indoor unit error occurrence, the error number is only shown at remote controller without 7 segment LED of outdoor unit.

Ex) CH → 01 : Error occurrence with error number 01 (at remote controller)
In case of compressor error occurrence, 7 segment LED of outdoor unit control board will display its error number alternately with compressor number.

Ex) 213 → C23 : It means that compressor error occurred with Error No. 21 at No. 3 Outdoor unit (=Slave2)

Display				Title	Cause of Error
Indoor unit related error	0	1	–	Air temperature sensor of indoor unit	Air temperature sensor of indoor unit is open or short
	0	2	–	Inlet pipe temperature sensor of indoor unit	Inlet pipe temperature sensor of indoor unit is open or short
	0	3	–	Communication error : wired remote controller ↔ indoor unit	Failing to receive wired remote controller signal in indoor unit PCB
	0	4	–	Drain pump	Malfunction of drain pump
	0	5	–	Communication error : (Gen2) IDU ↔ ODU (Gen4) IDU main ↔ IDU local modem	Failing to receive the signal : (Gen2) from ODU (Gen4) from IDU local modem
	0	6	–	Outlet pipe temperature sensor of indoor unit	Outlet pipe temperature sensor of indoor unit is open or short
	0	8	–	Hydro Kit Hot water storage tank Temperature sensor	Pipe temperature sensor is open or short
	0	9	–	Indoor EEPROM Error	In case when the serial number marked on EEPROM of Indoor unit is 0 or FFFFFF
	1	0	–	Poor fan motor operation	Disconnecting the fan motor connector / Failure of indoor fan motor lock
	1	1	–	Communication error : Hydro Kit Indoor unit ↔ Inv.PCB	Failing to receive Inv. PCB signal in indoor unit
	1	2	–	Hydro Kit Inv.PCB error	Hydro Kit Inv.PCB error
	1	3	–	Hydro Kit Solar heat piping temperature sensor error	Pipe temperature sensor is open or short
	1	4	–	Hydro Kit Indoor unit Flow switch error	Flow switch flow detection error
	1	5	–	Hydro Kit Liquid pipe Strange overheat Error	Temperature sensor defective or hot water inflow
	1	6	–	Hydro KitIndoor unit Inlet and Outlet pipe Temperature sensor Error	Pipe temperature sensor is open or short
	1	7	–	Hydro Kit Indoor unit Inlet pipe Temperature sensor Error Outside air Introduction duct Inlet pipe Temperature sensor Error	Pipe temperature sensor is open or short
	1	8	–	Hydro Kit Indoor unit Outlet pipe Temperature sensor Error	Pipe temperature sensor is open or short
	2	3	0 –	Refrigerant leakage sensing error	Malfunction of Refrigerant Sensor
	2	3	7 –	Communication error between IDU and ODU local modem	Failing to receive the signal from ODU local modem
	2	3	8 –	Communication error between ODU modem and ODU PCB	Failing to receive receive the signal from outdoor unit packet
Outdoor unit related error	2	1	*	Outdoor Unit Inverter Compressor IPM Fault	Master Outdoor Unit Inverter Compressor Drive IPM Fault
	2	2	*	Inverter PCB Input Over Current(RMS) of Master Outdoor Unit	Master Outdoor Unit Inverter PCB Input Current excess (RMS)
	2	3	*	Outdoor Unit Inverter Compressor DC Link Low or High Voltage	System is turned off by Master Outdoor Unit DC Link Low/High Voltage.
	2	4	*	Outdoor Unit High Pressure Switch	System is turned off by Master Outdoor Unit high pressure switch.
	2	5	*	Outdoor Unit Input Voltage High/ Low Voltage	Over 537V or below 247V (ARUM***LTE5) Over 310V or below 143V (ARUM***BTE5) Over 598V or below 320V (ARUM***DTE5)
	2	6	*	Outdoor Unit Inverter Compressor Start Failure	The first start failure by Outdoor Unit Inverter Compressor abnormality or Compressor locked
	2	9	*	Outdoor Unit Inverter Compressor Over Current	Outdoor Unit Inverter Compressor Fault OR Drive Fault
	3	2	*	Outdoor Unit Inverter Compressor1 High Discharge Temperature	Outdoor Unit Inverter Compressor1 High Discharge Temperature
	3	3	*	Outdoor Unit Inverter Compressor2 High Discharge Temperature	Outdoor Unit Inverter Compressor2 High Discharge Temperature
	3	4	*	High Pressure of Outdoor Unit	High Pressure of Outdoor Unit
	3	5	*	Low Pressure of Outdoor Unit	Low Pressure of Outdoor Unit
	4	0	*	Outdoor Unit Inverter Compressor CT Sensor Fault	Outdoor Unit Inverter Compressor CT Sensor open or short
	4	1	*	Outdoor Unit Inverter Compressor1 Discharge Temperature Sensor Fault	Outdoor Unit Inverter Compressor Discharge Temperature Sensor open or short
	4	2	*	Outdoor Unit Low Pressure Sensor Fault	Outdoor Unit Low Pressure Sensor open or short
	4	3	*	Outdoor Unit High Pressure Sensor Fault	Outdoor Unit High Pressure Sensor open or short
	4	4	*	Outdoor Unit Air Temperature Sensor Fault	Outdoor Unit Air Temperature Sensor open or short
	4	5	*	Outdoor Unit Heat Exchanger Temperature Sensor(Front side) Fault	Outdoor Unit Heat Exchanger Temperature Sensor(Front side) open or short
	4	6	*	Outdoor Unit Suction Temperature Sensor Fault	Outdoor Unit Suction Temperature Sensor open or short

Display				Title	Cause of Error
Outdoor unit related error	4	7	*	Outdoor Unit Inverter Compressor2 Discharge Temperature Sensor Fault	Outdoor Unit Inverter Compressor2 Discharge Tem–perature Sensor open or short
	4	9	*	Outdoor Unit Faulty IPM Temperature Sensor	Outdoor Unit IPM Temperature Sensor short/open
	5	0	*	Omitting connection of R, S, T power of Outdoor Unit	Omitting connection of outdoor unit
	5	1	*	Excessive capacity of indoor units	Excessive connection of indoor units compared to capacity of Outdoor Unit
	5	2	*	Communication error : inverter PCB → Main PCB	Failing to receive inverter signal at main PCB of Outdoor Unit
	5	3	*	Communication error : indoor unit → Main PCB of Outdoor Unit	Failing to receive indoor unit signal at main PCB of Outdoor Unit.
	5	7	*	Communication error : Main PCB → inverter PCB	Failing to receive signal main PCB at inverter PCB of Outdoor Unit
	5	9	*	Mixing Installation of slave Outdoor Unit	Mixing Installation of Old Slave Outdoor Unit and New Slave Outdoor Unit
	6	0	*	Inverter PCB EEPROM Error of Master Outdoor Unit	Access Error of Inverter PCB of Outdoor Unit
	6	2	*	Outdoor Unit Inverter Heatsink High Tem–perature	System is turned off by Outdoor Unit Inverter Heatsink High Temperature
	6	5	*	Outdoor Unit Inverter Heatsink Temperature Sensor Fault	Outdoor Unit Inverter Heatsink Temperature Sensor open or short
	6	7	*	Outdoor Unit Fan Lock	Restriction of Outdoor Unit
	7	1	*	Inverter CT Sensor Error of Master Outdoor Unit	Inverter CT Sensor open or short of Outdoor Unit
	7	5	*	Outdoor Unit Fan CT Sensor Error	Outdoor Unit Fan CT Sensor open or short
	7	7	*	Outdoor Unit Fan Over Current Error	Outdoor Unit Fan Current is over 6A
	7	9	*	Outdoor Unit Fan Start Failure Error	The first start failure by Outdoor Unit Fan abnormality or Fan locked
	8	6	*	Outdoor Unit Main PCB EEPROM Error	Communication Fail Between Outdoor Unit Main MICOM and EEPROM or omitting EEPROM
	8	7	*	Outdoor Unit Fan PCB EEPROM Error	Communication Fail Between Outdoor Unit Fan MICOM and EEPROM or omitting EEPROM
	1	0	4	*	Communication Error Between Outdoor Unit and Other Outdoor Unit	Failing to receive Slave Unit signal at main PCB of Outdoor Unit
	1	0	5	*	Outdoor Unit Fan PCB Communication Error	Failing to receive fan signal at main PCB of Outdoor unit

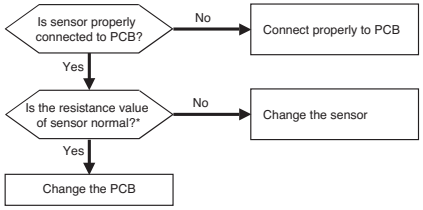
Display					Title	Cause of Error
Outdoor unit related error	1	0	6	*	Outdoor Unit Fan IPM Fault Error	Instant Over Current at Outdoor Unit Fan IPM
	1	0	7	*	Outdoor Unit Fan DC Link Low Voltage Error	Outdoor Unit Fan DC Link Input Voltage is under 380V
	1	1	3	*	Outdoor Unit Liquid pipe Temperature Sensor Error	Liquid pipe temperature sensor of Outdoor Unit is open or short
	1	1	4	*	Outdoor Unit Subcooling Inlet Temperature Sensor Error	Outdoor Unit Subcooling Inlet Temperature Sensor Error
	1	1	5	*	Outdoor Unit Subcooling Outlet Temperature Sensor Error	Outdoor Unit Subcooling Outlet Temperature Sensor Error
	1	1	6	*	Outdoor Unit Oil Level Sensor Error	Oil Level Sensor of Outdoor Unit is open or short
	1	4	5	*	Outdoor unit Main Board – External Board communication Error	Outdoor unit Main Board – External Board com–munication Error
	1	5	0	*	Outdoor Unit Discharge Superheat not satisfied	Outdoor Unit Compressor Discharge Superheat not satisfied during 5 Min.
	1	5	1	*	Failure of operation mode conversion at Outdoor Unit	Failure of operation mode conversion at Outdoor Unit
	1	5	3	*	Outdoor Unit Heat Exchanger Temperature Sensor(upper part) Fault	Outdoor Unit Heat Exchanger Temperature Sensor (upper part) Fault
	1	5	4	*	Outdoor Unit Heat Exchanger Temperature Sensor(lower part) Fault	Outdoor Unit Heat Exchanger Temperature Sensor(lower part) open or short
	1	8	2	*	Outdoor unit External Board Main–Sub Micom communication Error	Outdoor Unit Main Board Main–Sub Micom com–munication failed
	1	8	7	*	Hydro – Kit P,HEX bursting error	Inlet water temperature is below 5 degree or water temperature error during defrosting operation.
	1	9	3	*	Outdoor Unit Fan Heatsink High Tem–perature	System is turned off by Outdoor Unit Fan Heatsink High Temperature
	1	9	4	*	Outdoor Unit Fan Heatsink Temperature Sensor Fault	Outdoor Unit Fan Heatsink Temperature Sensor open or short
HR Unit related error	0	5	1	C+#HR	Excessive connection of indoor unit to HR unit	Indoor unit capacity exceed
	2	0	0	1	Master Outdoor Unit Main PCB EEPROM Error	Communication Fail Between Master Outdoor Unit Main MICOM and EEPROM or omitting EEPROM
	2	0	1	C+#HR	Master Outdoor Unit Fan PCB EEPROM Error	Communication Fail Between Master Outdoor Unit Fan MICOM and EEPROM or omitting EEPROM
	2	0	2	C+#HR	HR unit1 Sub Cooling Pipe sensor error	Sub Cooling Pipe In sensor of HR unit open or short
	2	0	3	C+#HR	HR unit1 Sub Cooling Pipe Out sensor error	Sub Cooling Pipe Out sensor of HR unit. open or short
	2	0	4	C+#HR	Communication error	Failing to receive HR unit signal at outdoor unit
	2	0	5	C+#HR	Communication error between HR unit and the upgraded 485 modem	Failing to receive signal at HR unit PCB
	2	0	6	C+#HR	Duplicate address error of HR unit	Duplicated setting at the 4 series of HR unit
Network error	2	4	2	*	Network error of cntral controller	Communication wiring defect

C: HR unit #: HR unit Number * : Unit(1: Master, 2: Slave1, 3: Slave2, 4: Slave3)

2. Error Code Check

Error No.	Error Type	Error Point	Main Reasons
01	Air temperature sensor error	Sensor is open/short	1. Indoor unit PCB wrong connection! 2. Indoor unit PCB failure! 3. Sensor problem (main reason)
02	Gas side temperature sensor error		
06	Liquid side temperature sensor error		
08	Water tank temperature sensor error		
16	Water inlet & outlet temperature sensor error		
17	Water inlet temperature sensor error		
18	Water outlet temperature sensor error		

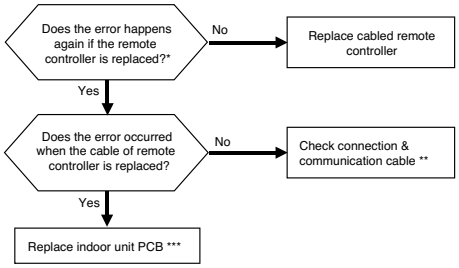
■ Error diagnosis and countermeasure flow chart



* If the resistance value of the temperature sensor changes according to temperature, and the following resistance values are displayed based on the current temperature, it is normal. (±5% error)
Air temperature sensor : 10°C(50°F)=20.7kΩ : 25°C(77°F)=10kΩ : 50°C(122°F)=3.4kΩ
Gas/Liquid side temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ
Water inlet/outlet temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ
Water tank temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ

Error No.	Error Type	Error Point	Main Reasons
03	No communication between cabled remote controller & indoor unit	The remote control–ler did not receive the signal from indoor unit during specific time	1. Remote controller fault 2. Indoor unit PCB fault 3. Connector fault, Wrong connection 4. Communication cable problem

■ Error diagnosis and countermeasure flow chart



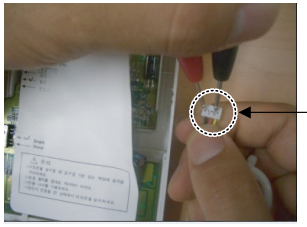
* If there is no remote controller to replace : Use another unit's remote controller doing well

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

*** After replacing indoor unit PCB, do Auto Addressing & input unit's address if connected to central controller.
(All the indoor units connected should be turned on before Auto Addressing

CN-REMO : Remote controller connection

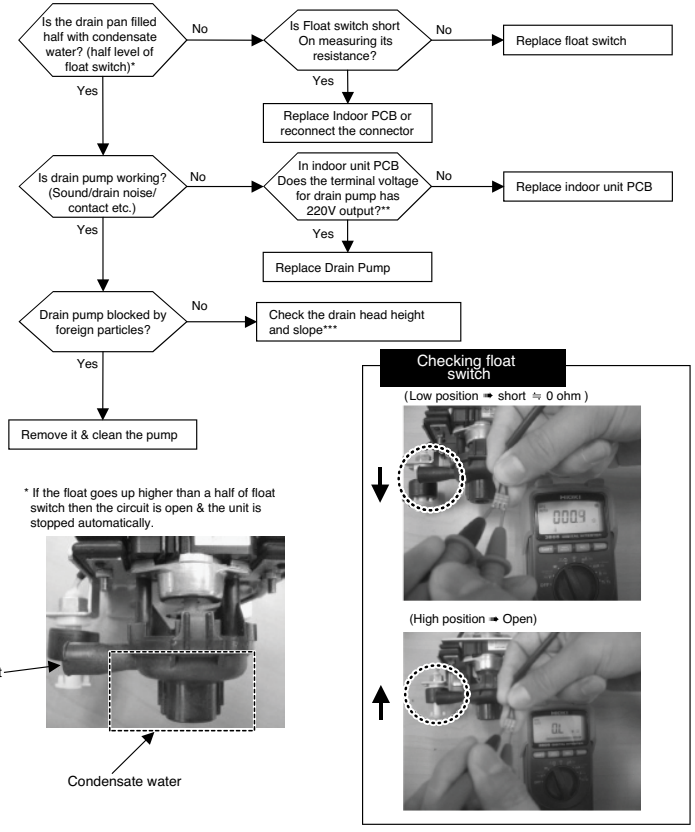
※ The PCB can differ from model to model.
Check from the right source.



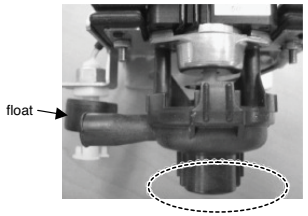
Checking communication cable connection status

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

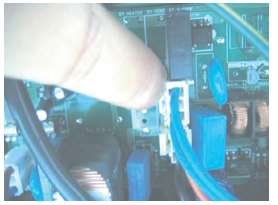
■ Error diagnosis and countermeasure flow chart



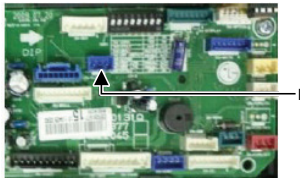
* If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.



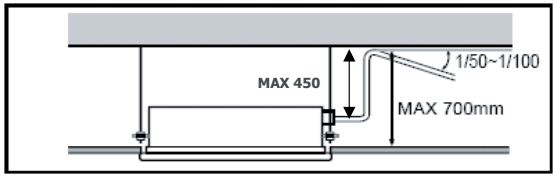
A:Point to check rotating



*** Indoor PCB drain pump connector
(Check input of 220V)
(Marked as **CN-DPUMP)**

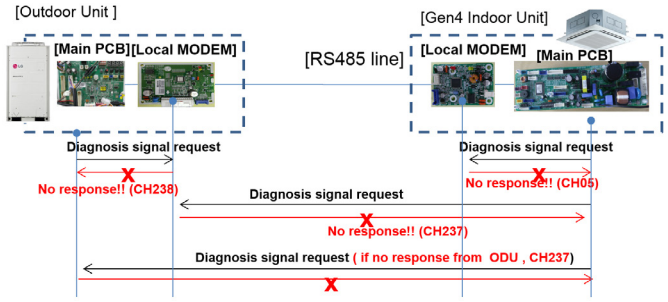


[***] Standard of drain pipe head height / slope

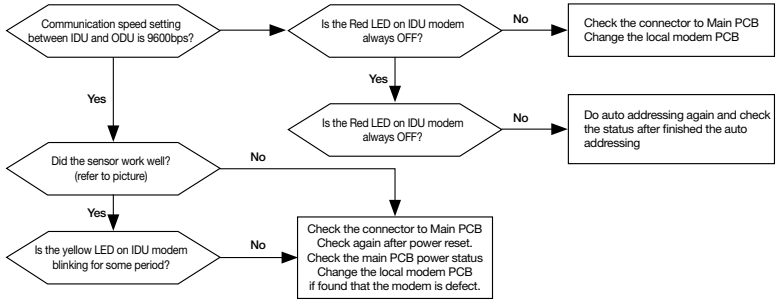


Error No.	Error Type	Error Point	Main Reasons
05	Communication error between IDU and ODU (Gen 2)	The indoor unit did not re–ceive the signal from ODU over 3 min continuously.	1. IDU PCB or ODU PCB defect 2. Communication line defect
	Communication error between IDU main and IDU local modem (Gen4)	The indoor unit did not receive the signal from IDU local modem over 3 min continuously.	1. IDU PCB or IDU Modem PCB defect 2. Communication line defect
237	Communication error between IDU and ODU local modem	The indoor unit did not receive the signal from ODU local modem over 3 min continuously.	1. IDU or ODU or Modem PCB defect 2. Communication line defect
238	Communication error between ODU mo–dem and ODU PCB	The indoor unit did not receive the signal from outdoor unit packet over 3 min continuously.	1. IDU/ODU/Modem PCB defect 2. Communication line defect between IDU and ODU modem

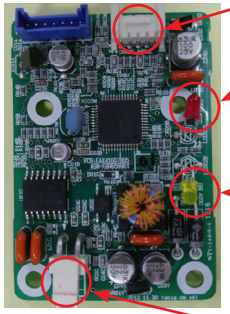
■ Error diagnosis and countermeasure flow chart



■ Error diagnosis and countermeasure flow chart for indoor unit local modem



• Local IDU Modem



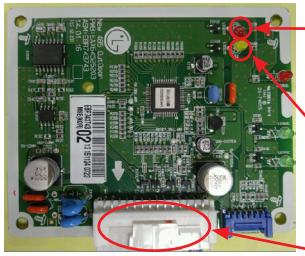
Connector to main PCB

For 9600 bps comm., the red LED will always turn on.
For 1200 bps comm., the red LED will always turn off after power reset and 3 min. later
* The communication speed can be set by dip switch in ODU.

When the indoor unit is sending the signal to other unit, this LED will be flickering.
If the LED is always off, please check below.
1) Check the connector between local modem and main pcb.
2) Do auto addressing from ODU if the communication speed is 1200 bps.
→ In case of 1200 bps, indoor unit will not response when there's no address.

RS485 Bus connector to other modem or ODU

• Local IDU Modem



For 9600 bps comm., the red LED will always turn on.
For 1200 bps comm., the red LED will always turn off after power reset and 3 min. later
* The communication speed can be set by dip switch in ODU

When the outdoor unit is sending the signal to IDU, this LED will be flickering.
If the LED is always off, check the connector between local modem and main PCB.

Connector to main PCB

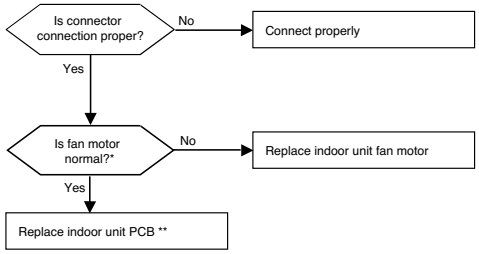
Error No.	Error Type	Error Point	Main Reasons
09	Indoor unit EEPROM error	Error occur in EEPROM of the Indoor PCB	1. Error developed in communica–tion between the micro– processor and the EEPROM on the surface of the PCB. 2. ERROR due to the EEPROM damage

■ Error diagnosis and countermeasure flow chart

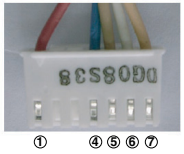
- Replace the indoor unit PCB, and then make sure to perform Auto addressing and input the address of central control

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

■ Error diagnosis and countermeasure flow chart



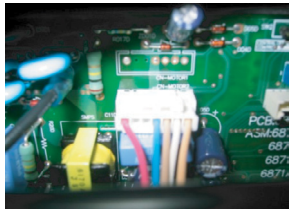
* It is normal when check hall sensor of indoor fan motor as shown below



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>



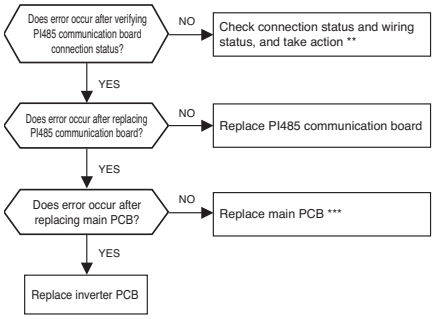
** Replace the indoor unit PCB, and then make sure to do Auto addressing and input the address of central control

⚠ WARNING

- 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 & inverter PCB com-munication error	No signal commu-nication between indoor unit & inverter PCB	1. Wired remote controller fault 2. Indoor unit PCB fault 3. Inverter PCB fault 4. PI485 communication board fault 5. Connector connection and contact defect 6. Cabled remote controller communication defect 7. PI485 communication cable defect

■ Error diagnosis and countermeasure flow chart



* When there is no service wired remote controller : Use the next indoor unit wired remote controller.

** Check cable status: It usually occurs when connection is defective or remote controller cable is extended and connected for use. Check the ambient noise effect (check distance from power cable), and take distance from device generating EMI.

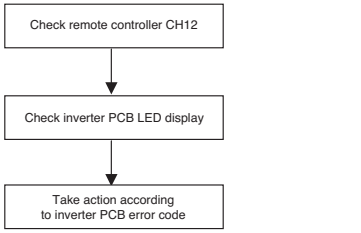
*** After replacing indoor unit PCB, perform auto addressing, and when there is a central controller, input indoor unit central control address.
(Newly perform auto addressing while power is applied to all the connected indoor units.)

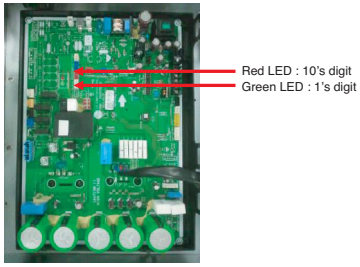
Error No.	Error Type	Error Point	Main Reasons
12	Inverter PCB error*	Error occurrence in inverter PCB	1. Connector connection defect 2. Inverter compressor error 3. Pressure sensor error

- If inverter PCB error occurs, remote controller No. 12 error is displayed, and detail error display can be checked using LED of the inverter PCB.
- Error display
  - Red LED means error no. 10's digit, and green LED means 1's digit, and when red and green simultaneously blink, it means 100's unit.
    Ex) After red and green LED simultaneously blink, red LED blinks 1 time, and green LED blinks 5 times : error no. 115

* Refer to page 28

■ Error diagnosis and countermeasure flow chart

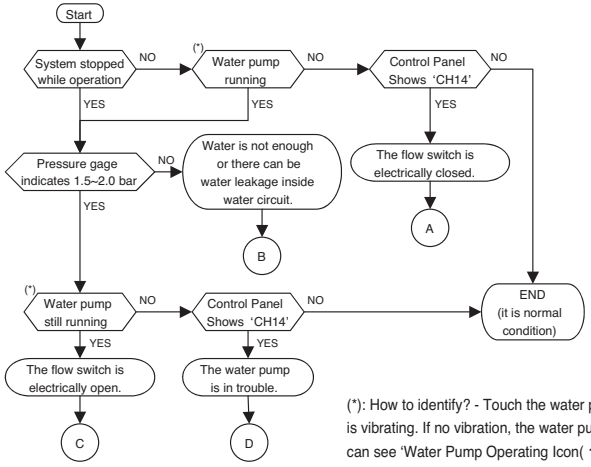




Error No.	Error Type	Error Point	Main Reasons
14	Flow Switch error	Abnormal working of flow switch	1. Pump fault 2. Low water flow 3. Flow switch fault(*)

(*) Flow switch status test

■ Error diagnosis and countermeasure flow chart



(*): How to identify? - Touch the water pump and feel if the water pump is vibrating. If no vibration, the water pump is not operating. Also, you can see 'Water Pump Operating Icon( ) ' at control panel.

A
- Although there is not water flow inside water circuit, the flow switch detects as if water is flowing. It is due to electrically closed (or short) of flow switch or the contact of flow switch is mechanically stuck.
- Replace the flow switch.

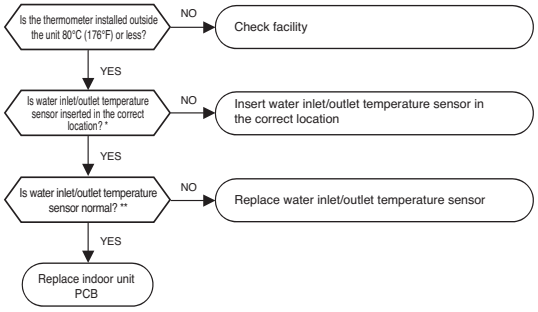
B
- Check if water inside water circuit is fully charged. Pressure gage at the indoor unit should indicate 1.5~2.0 bar.
- Also, as the hand of the pressure gage is not react so fast according to water charging, check the pressure gage again.
- Otherwise, there can be water leakage inside water circuit. Examine if water circuit is completely sealed.

C
- Although water is well flowing, the flow switch can not detect water flow. It is due to electrically) open of flow switch or the contact of flow switch is mechanically broken.
- Replace the flow switch.

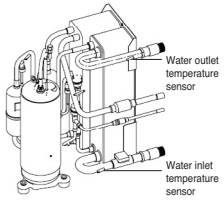
D
- Replace the water pump.
- Also, check the water quality if there are particles that can yield locking at the shaft of the water pump.

Error No.	Error Type	Error Point	Main Reasons
15	Water pipe overheated	Water outlet tempera–ture is above 85℃(185℉)	1. High temperature of water inflow 2. Temperature sensor defect 3. Indoor unit PCB fault

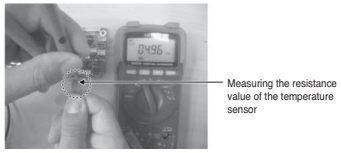
■ **Error diagnosis and countermeasure flow chart**



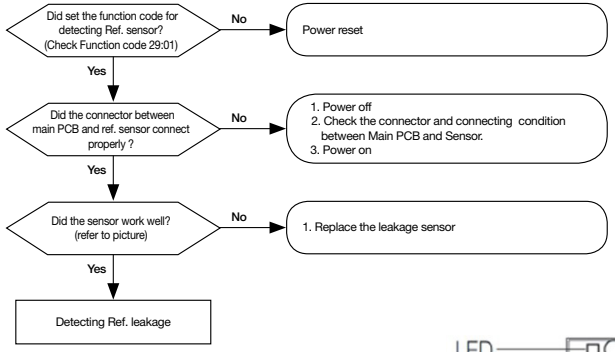
*Water inlet/outlet temperature sensor location

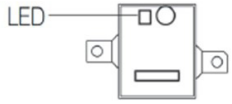


**If the resistance value of the temperature sensor changes according to temperature, and the following resistance values are displayed based on the current temperature, it is normal. (±5% error)
- Air temperature sensor : 10°C(50°F)=20.7kΩ : 25°C(77°F)=10kΩ : 50°C(122°F)=3.4kΩ
- Gas/Liquid side temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ
- Water inlet/outlet temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ
- Water tank temperature sensor : 10°C(50°F)=10kΩ : 25°C(77°F)=5kΩ : 50°C(122°F)=1.8kΩ



Error No.	Error Type	Error Point	Main Reasons
230	Refrigerant leakage sensing error	Detecting the error of the Ref. sensor.	1. Function code setting without Ref. sensor 2. Malfunction of Rf. Sensor 3. Detecting the leakage of Ref.

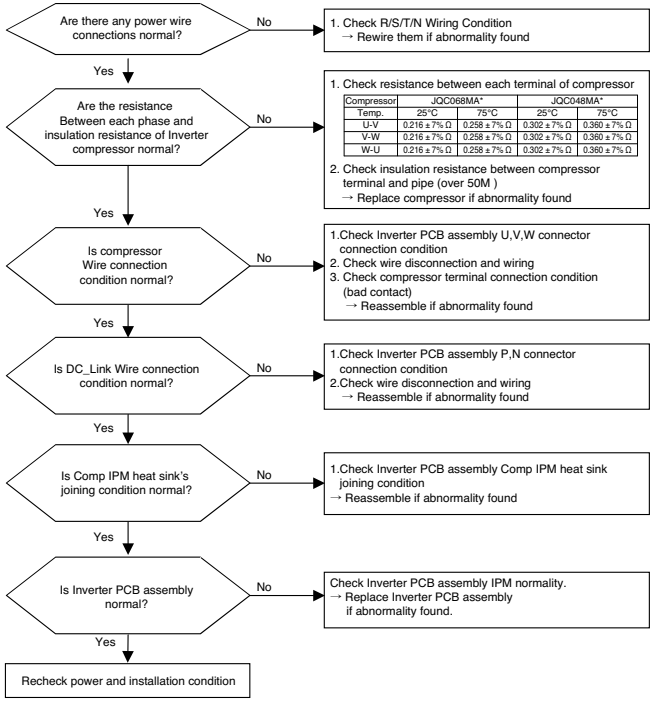




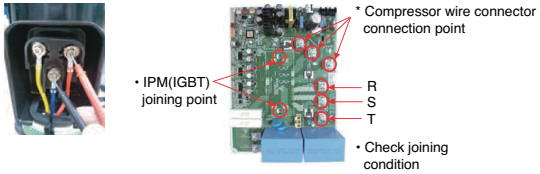
Normal status: Blinking Green LED or both Green and Red LED on.
Error status: the green and red LED blink alternately.

Error No.	Error Type	Error Point	Main Reasons
21*	Inverter PCB Assy. IPM Fault occur	IPM self protection circuit activation (Overcurrent/IPM over-heating/Vcc low voltage)	1. Over current detection at Inverter compressor(U,V,W) 2. Compressor damaged (insulation damaged/Motor damaged) 3. IPM overheating(Heat sink disas-sembled) 4. Inverter compressor terminal discon-nected or loose 5. Inverter PCB assembly damaged 6. ODU input current low

■ Error diagnosis and countermeasure flow chart



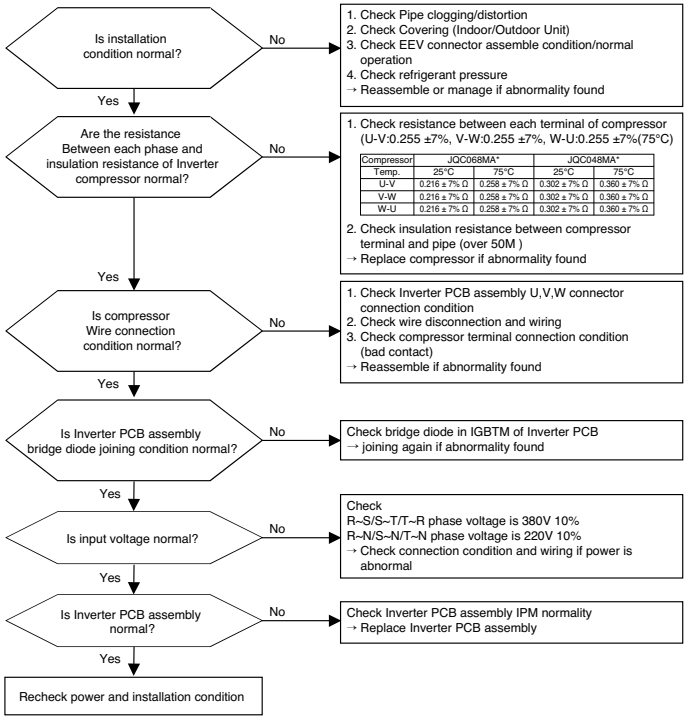
* Measuring resistance between each terminal of compressor



• Check DC Link connector joining condition

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

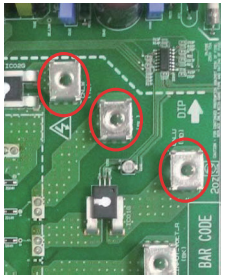
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring resistance between each terminal of compressor

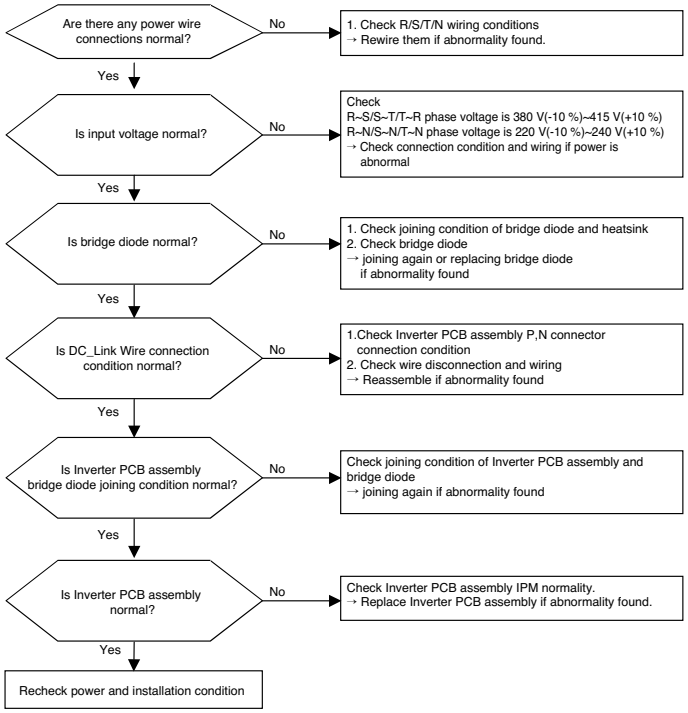
* Measuring input voltage

* Compressor wire connector connection



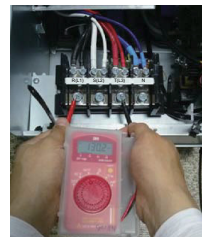
Error No.	Error Type	Error Point	Main Reasons
23*	Inverter PCB DC Link Low Voltage	DC Voltage isn't charged after starting relay on	1. DC Link terminal misconnection/terminal contact fault 2. Condenser damage 3. PCB assembly damage (DC Link voltage sensing part) 4. Input voltage low

■ Error Diagnosis and Countermeasure Flow Chart



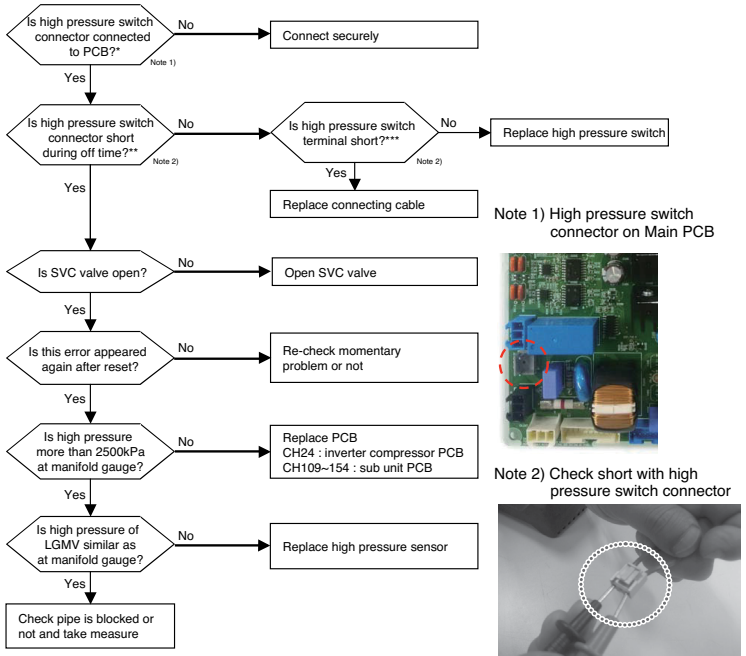
* Check DC_Link Connector joining condition

* Measuring input voltage



Error No.	Error Type	Error Point	Main Reasons
24*	Excessive rise of discharge pressure in outdoor compressor	Compressor off due to the high pressure switch in outdoor unit	1. Defective high pressure switch 2. Defective fan of indoor unit or outdoor unit 3. Check valve of compressor clogged 4. Pipe distortion due to the pipe damage 5. Refrigerant overcharge 6. Defective EEV at the indoor or outdoor unit. 7. Covering or clogging(Outdoor covering during the cooling mode /Indoor unit filter clogging during the heating mode) 8. SVC valve clogging 9. Defective outdoor PCB 10. Defective active path valve

■ Error diagnosis and countermeasure flow chart

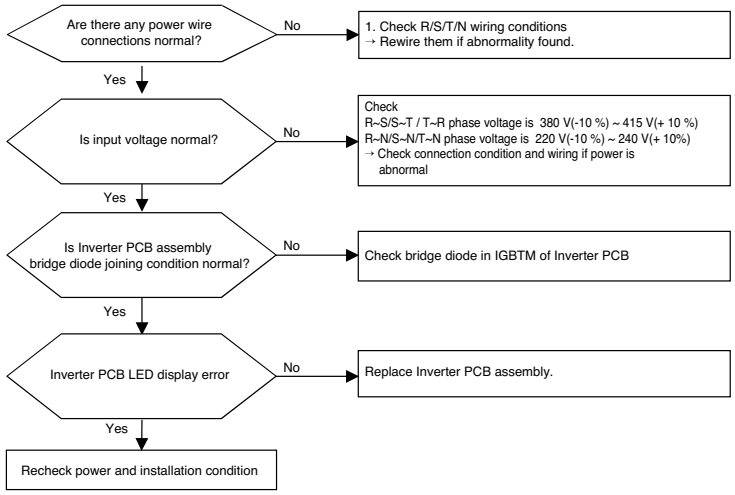


Note 1) High pressure switch connector on Main PCB

Note 2) Check short with high pressure switch connector

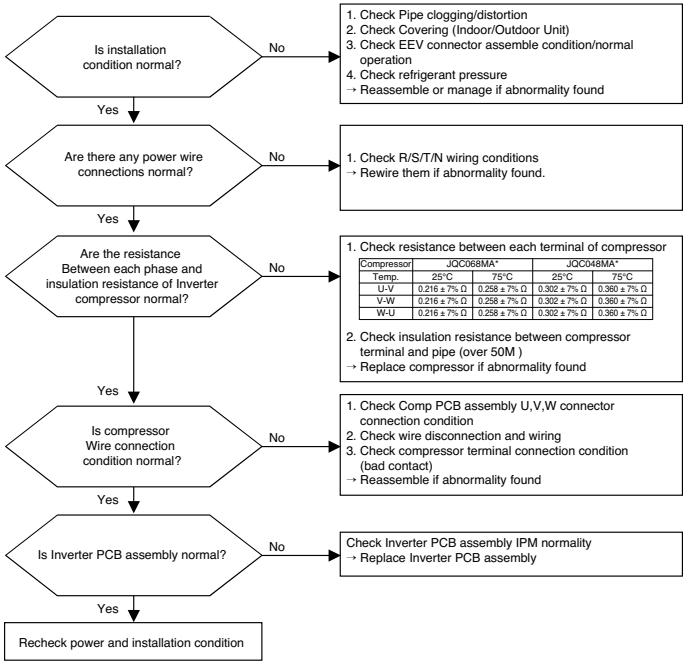
Error No.	Error Type	Error Point	Main Reasons
25*	Input Voltage high/low	Input voltage is over limited value of the product (304 V or less, 536 V or more)	1. Input voltage abnormal (T–N, R–S, S–T, T–R) 2. Outdoor unit Inverter PCB assembly damage(input voltage sensing part) 3. N phase line disconnection

■ Error Diagnosis and Countermeasure Flow Chart



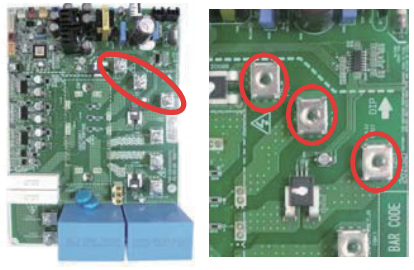
Error No.	Error Type	Error Point	Main Reasons
26*	Inverter compressor starting failure Error	Starting failure because of compressor abnormality	1. Overload operation (Pipe clogging/Covering/EEV defect/ Ref. overcharge) 2. Compressor damage (Insulation damage/Motor damage) 3. Compressor wiring fault 4.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

■ Error Diagnosis and Countermeasure Flow Chart



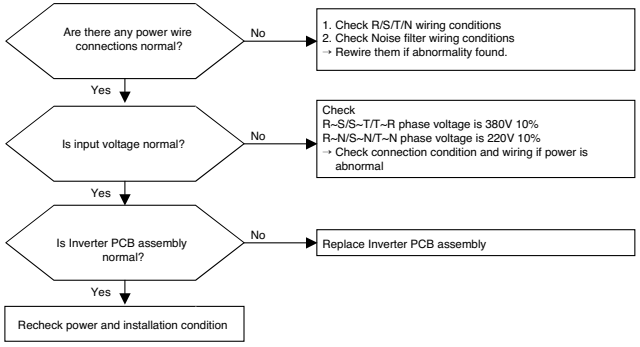
* Measuring resistance between each terminal of compressor

* Compressor wire connection



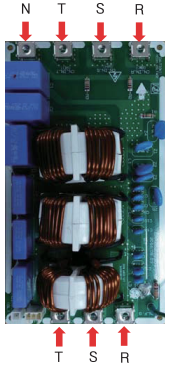
Error No.	Error Type	Error Point	Main Reasons
28*	Inverter DC link high voltage error	Inv PCB DC link voltage supplied over 780V	1. Input voltage abnormal (R,S,T,N) 2. ODU Comp PCB damage (DC Link voltage sensing part)

■ Error Diagnosis and Countermeasure Flow Chart



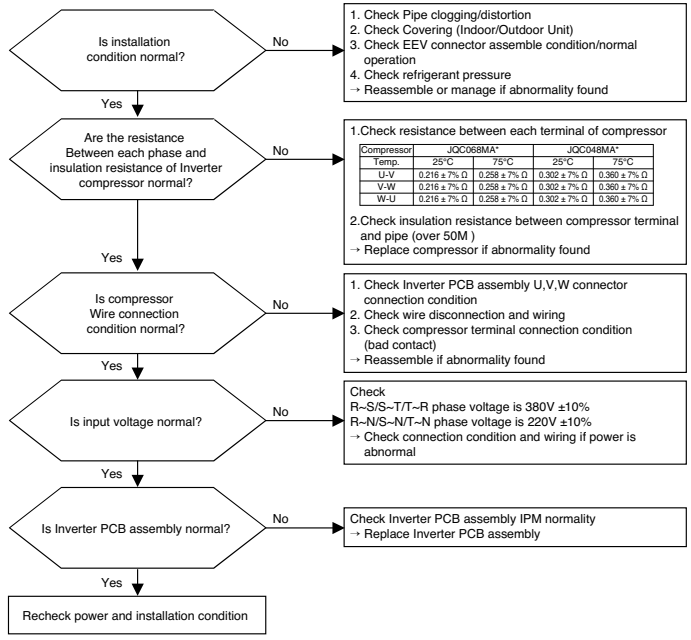
* Measuring input voltage

* Noise filter wiring



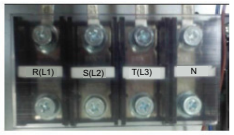
Error No.	Error Type	Error Point	Main Reasons
29*	Inverter compressor over current	Inverter compressor in-put current is over 30A	1. Overload operation (Pipe clogging/Covering/EEV defect/ Ref.overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. ODU Inverter PCB assembly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

■ Error Diagnosis and Countermeasure Flow Chart

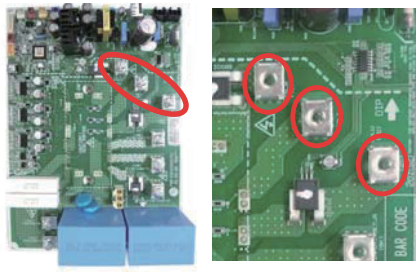


*** Measuring resistance between each terminal of compressor**

*** Measuring input voltage**

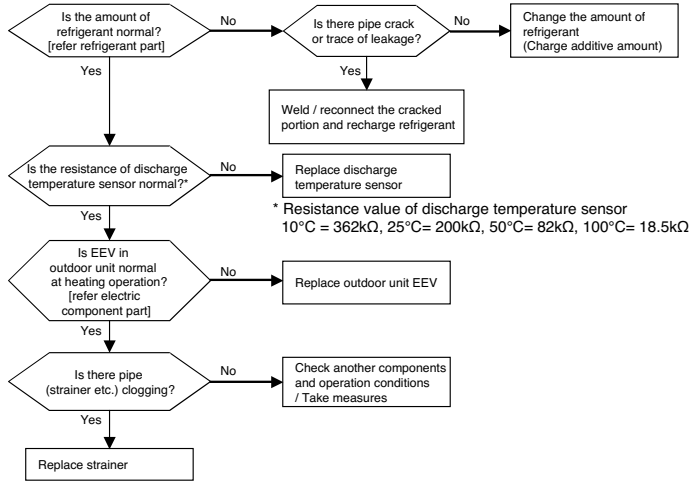


*** Compressor wire connection**



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

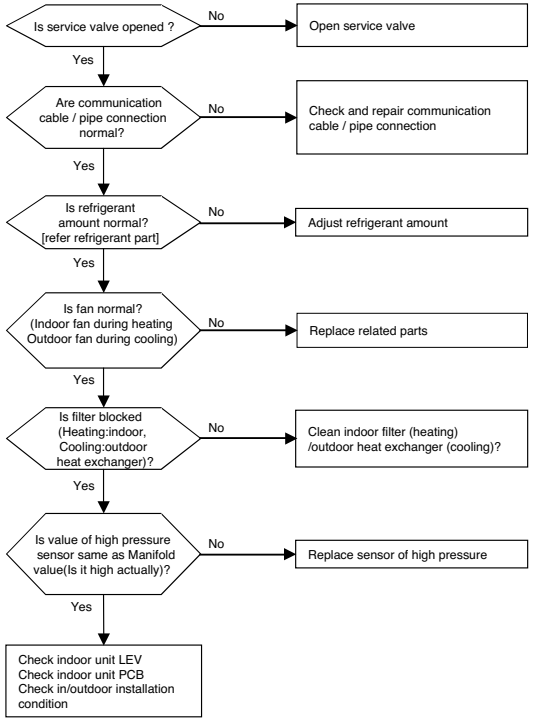
■ Error diagnosis and countermeasure flow chart



* Resistance value of discharge temperature sensor
10°C = 362kΩ, 25°C= 200kΩ, 50°C= 82kΩ, 100°C= 18.5kΩ

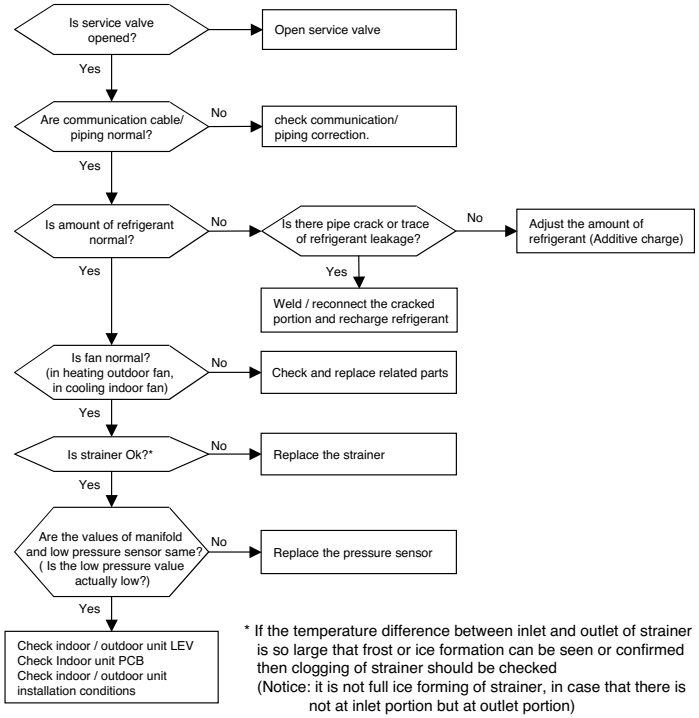
Error No.	Error Type	Error Point	Main Reasons
34*	Over–increase of discharge pressure of compressor	Error happens because of 10 times successive com–pressor off due to overincrease of high pressure by high pressure sensor	1. Defect of high pressure sensor 2. Defect of indoor or outdoor unit fan 3. Deformation because of damage of refriger–ant pipe 4. Over–charged refrigerant 5. Defective indoor / outdoor unit EEV 6. When blocked – Outdoor unit is blocked during cooling – Indoor unit filter is blocked during heating 7. SVC valve is clogged 8. PCB defect of outdoor unit 9. Indoor unit's pipe temperature defect 10. Indoor unit pipe temperature sensor defect

■ **Error diagnosis and countermeasure flow chart**



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

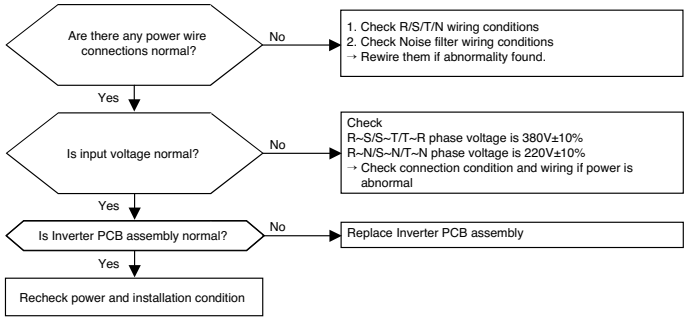
■ **Error diagnosis and countermeasure flow chart**



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

Error No.	Error Type	Error Point	Main Reasons
40*	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. DC power part damage (DC 5V) 3. Outdoor unit's inverter PCB damage (CT sensing part)

■ Error Diagnosis and Countermeasure Flow Chart

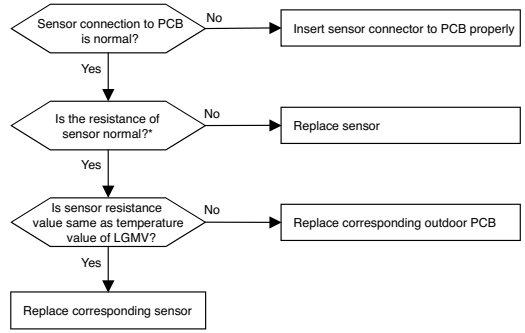


* Measuring input voltage

* Inverter PCB assembly

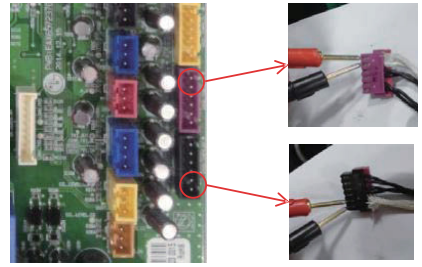
Error No.	Error Type	Error Point	Main Reasons
41*	Compressor1 discharge pipe temperature sensor error	Sensor measurement value is abnormal (Open/Short)	1. Defective connection of the compressor1 discharge pipe temperature sensor 2. Defective discharge pipe compressor sensor of the compressor1 (open/short) 3. Defective outdoor PCB
47*	Compressor2 discharge pipe temperature sensor error	Sensor measurement value is abnormal (Open/Short)	1. Defective connection of the compressor1 discharge pipe temperature sensor 2. Defective discharge pipe compressor sensor of the compressor1 (open/short) 3. Defective outdoor PCB

■ Error diagnosis and countermeasure flow chart



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

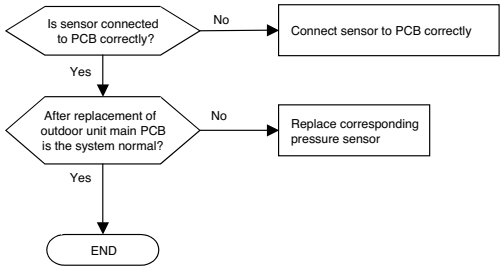
Note: Standard values of resistance of sensors at different temperatures (5% variation)
10°C = 362kΩ : 25°C= 200kΩ : 50°C= 82kΩ : 100°C= 18.5kΩ

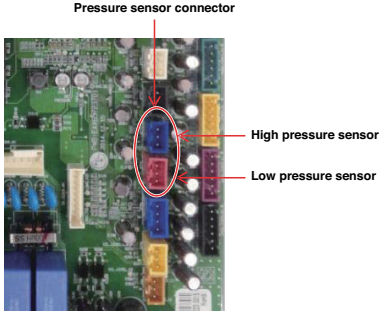


Check the resistance inverter compressor discharge temperature sensor

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

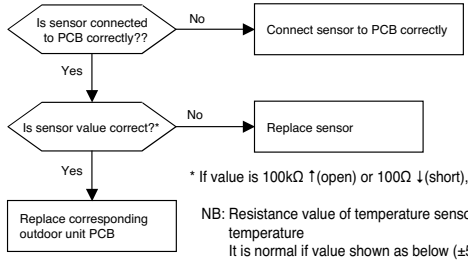
■ **Error diagnosis and countermeasure flow chart**





Error No.	Error Type	Error Point	Main Reasons
44*	Sensor error of outdoor air tem–perature	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB
45*	Piping temperature sensor error of heat exchanger in master & slave outdoor unit heat exchanger (A,B)	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB
46*	Compressor suction temperature sensor error	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB
49*	Outdoor Unit IPM Temperature Sensor Fault	Outdoor Unit IGBTM Temperature Sensor Open or Short	1. Bad connection of air temperature connector 2. Defect of air temperature connector(Open/Short) 3. Defect of outdoor PCB

■ **Error diagnosis and countermeasure flow chart**



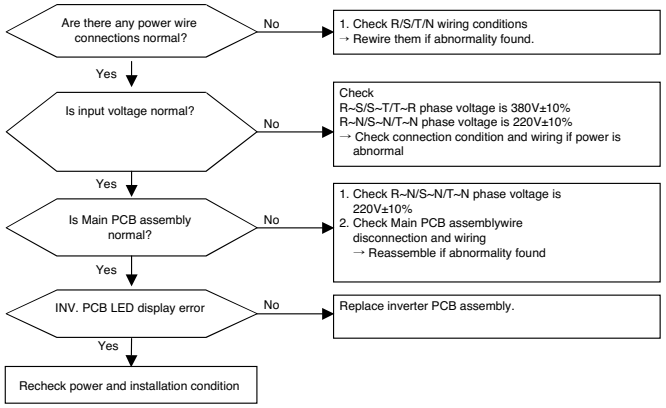
* If value is 100kΩ ↑(open) or 100Ω ↓(short), error occurs

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

Error No.	Error Type	Error Point	Main Reasons
153*	Outdoor Unit Upper Heat Exchanger Temperature Sensor Fault	Outdoor Unit Upper Heat Exchanger Temperature Sensor open or short	1. Temperature Sensor Connecting Fault 2. Temperature Sensor(Open/Short) 3. Main PCB Fault
154*	Outdoor Unit Low Heat Exchanger Temperature Sensor Fault	Outdoor Unit Low Heat Exchanger Temperature Sensor open or short	1. Temperature Sensor Connecting Fault 2. Temperature Sensor(Open/Short) 3. Main PCB Fault

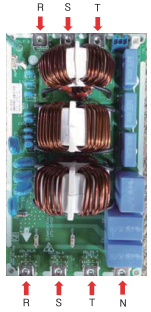
Error No.	Error Type	Error Point	Main Reasons
50*	ODU 3phase power omission error	Omitting one or more of R,S,T input power	1. Input Voltage abnormal (R,S,T,N) 2. Check power Line connection condition 3. Main PCB damage 4. Inverter PCB input current sensor fault

■ Error Diagnosis and Countermeasure Flow Chart

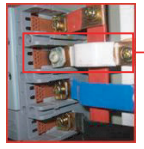


* Measuring input voltage

* Noise filter wiring



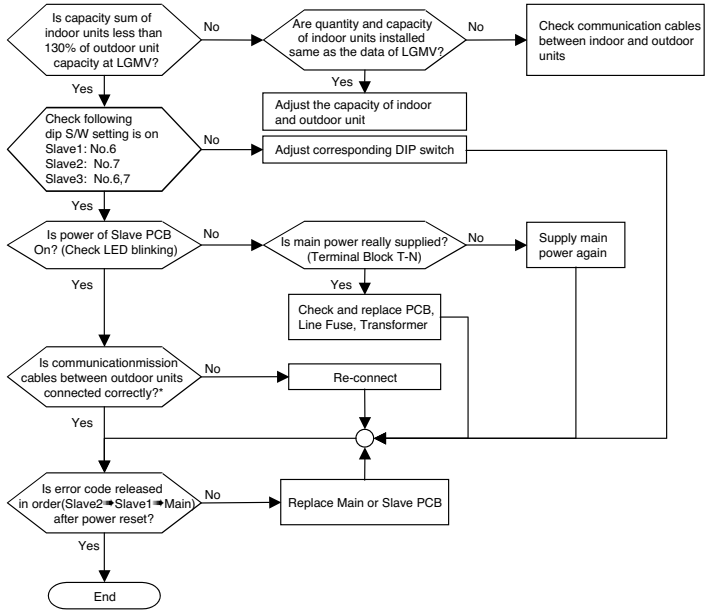
* Field Fault Case



* R-Phase Terminal Changed Color.

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

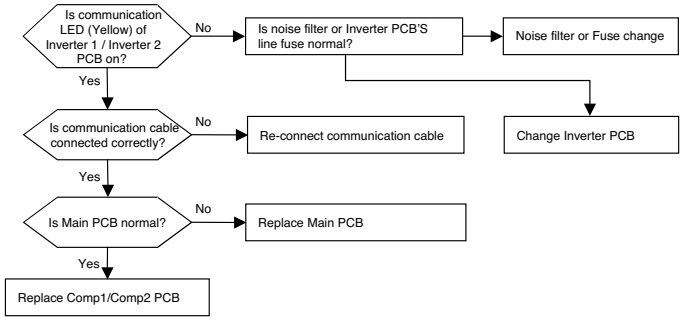
■ Error diagnosis and countermeasure flow chart



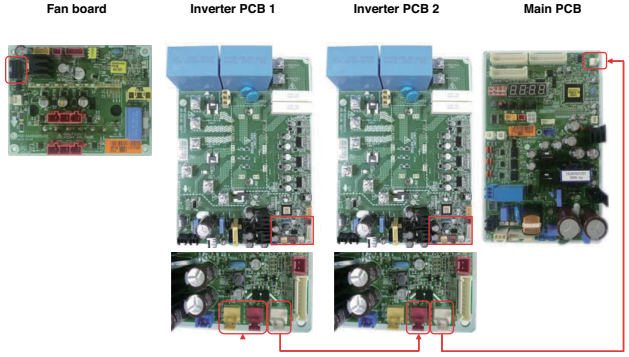
* In order to check communication cables between outdoor units,
check in order as below : PCB connectors ➡ terminal block ➡ communication cables

Error No.	Error Type	Error Point	Main Reasons
52*	Communication error between (Inverter1/ Inverter2 PCB → Main PCB)	Main PCB of Master unit of Master unit can't receive signal from Comp1/Comp2 controller	1. Power cable or communication cable is not connected 2. Defect of outdoor Main PCB or Comp1/ Comp2 PCB

■ Error diagnosis and countermeasure flow chart

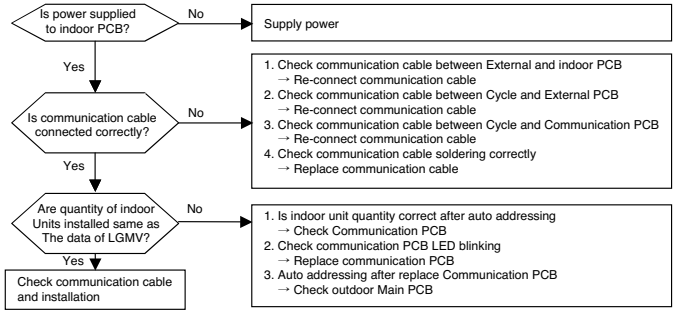


* The method of checking Main PCB and Inverter 1 / Inverter 2 PCB (If normal, communication LED blinks)



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

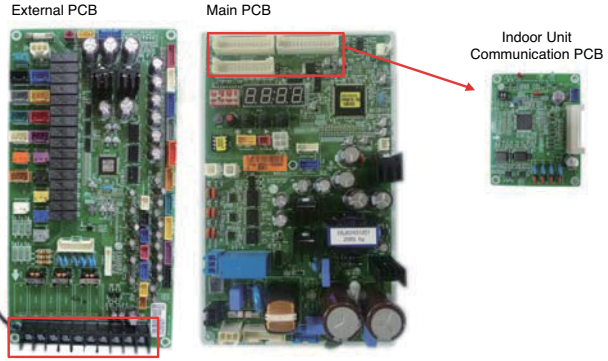
■ Error diagnosis and countermeasure flow chart



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

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

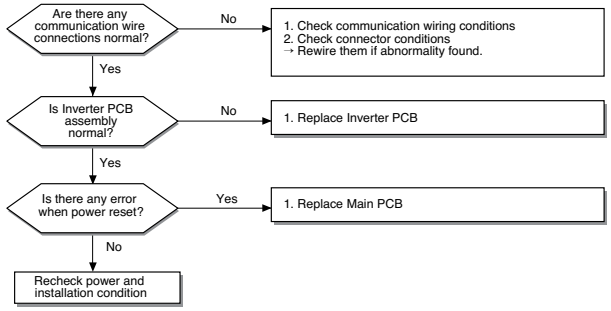
* After replacement of indoor unit PCB, Auto Addressing should be done, if central controller is installed then the central control address also should be input.
In case that only communication PCB is replaced above process is not needed

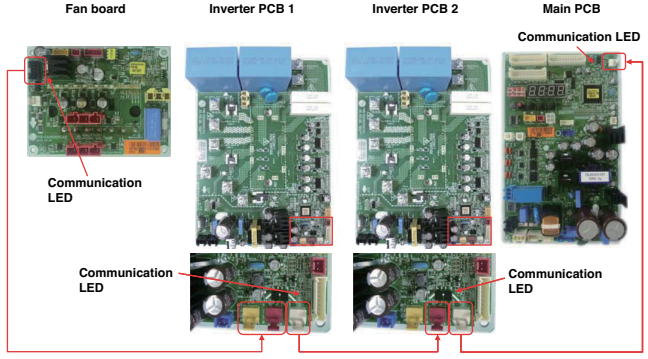


Wiring Fault Case

Error No.	Error Type	Error Point	Main Reasons
57*	Communication error : Main PCB → Inverter PCB	Failing to receive inverter signal at main PCB of Outdoor Unit	1. Bad Connection Between Inverter PCB and Comp PCB 2. Communication Wire Noise Effect 3. ODU Main PCB Damage 4. ODU Inverter PCB Damage

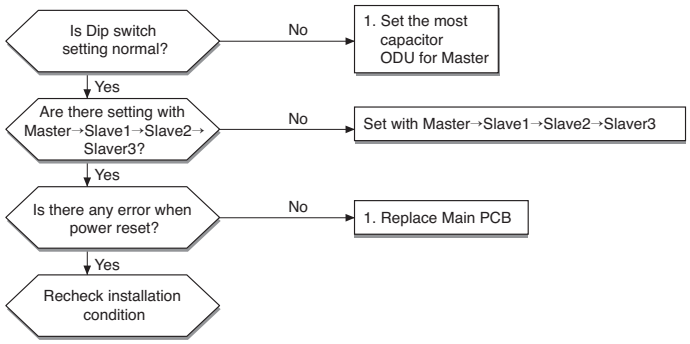
■ Error diagnosis and countermeasure flow chart





Error No.	Error Type	Error Point	Main Reasons
59*	Series combination Error	Series Installation of Slave Outdoor Unit Larger Than Master Capacity	1. Dip Switch Setting Error

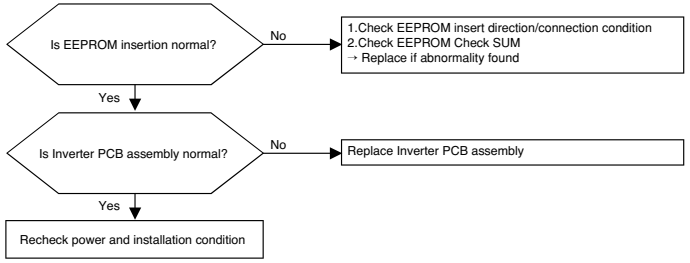
■ Error Diagnosis and Countermeasure Flow Chart



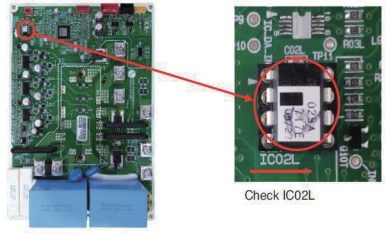
* Dip Switch Setting

Error No.	Error Type	Error Point	Main Reasons
60*	Inverter PCB EE–PROM 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

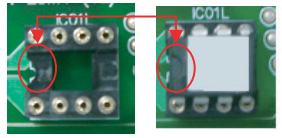


* Inverter EEPROM inserting point



Check IC02L

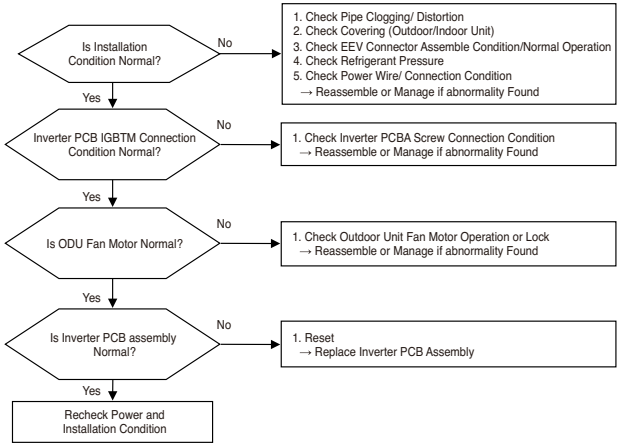
* Right inserting direction of inverter EEPROM



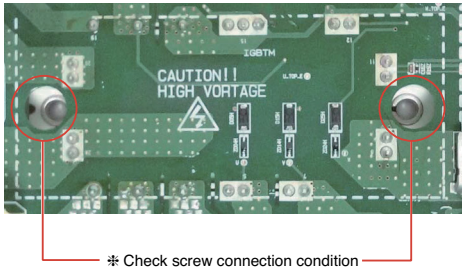
※ Note : Replace after power off

Error No.	Error Type	Error Point	Main Reasons
62*	Inverter PCB Heat-sink Temperature High	Heatsink Tempera-ture is Over 90℃	1. Inverter PCB IGBTM Connection Condition Abnormal 2. Outdoor Unit Fan Motor Operation Abnormal 3. Outdoor Unit Inverter PCB Assembly Defect 4. Overload Operation (Pipe Clogging/ Cover-ing/EEV Defect/Ref. Overcharge)

■ Error diagnosis and countermeasure flow chart

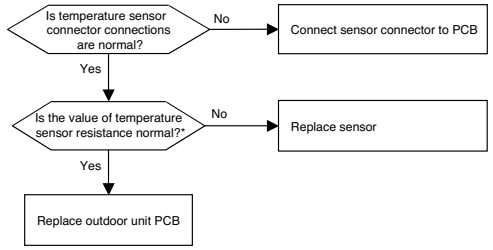


■ Check Inverter PCB Screw Connection Condition



Error No.	Error Type	Error Point	Main Reasons
65*	Inverter PCB Power Module sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connection 2. Defective temperature sensor(Open / Short) 3. Defective outdoor unit PCB

■ Error diagnosis and countermeasure flow chart

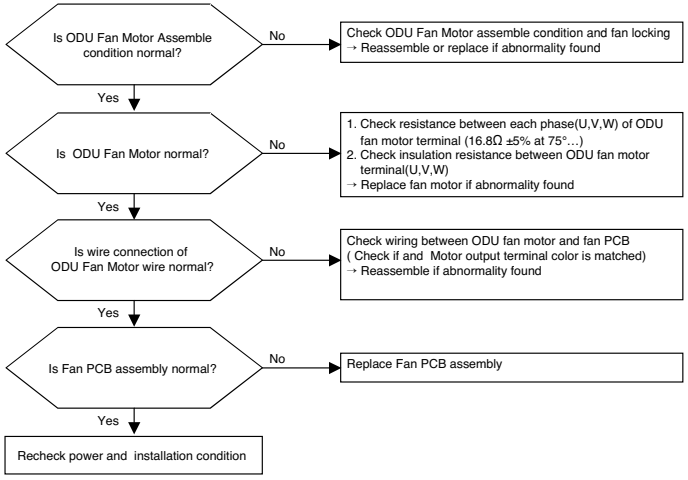


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

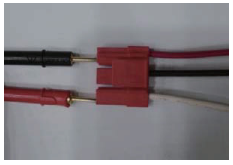
Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10°C = 20.7kΩ : 25°C = 10kΩ : 50°C= 3.4kΩ
Pipe temperature sensor: 10°C = 10kΩ : 25°C = 5kΩ :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

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

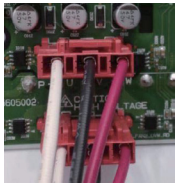
■ Error Diagnosis and Countermeasure Flow Chart



* Fan Motor resistance measuring between each phase



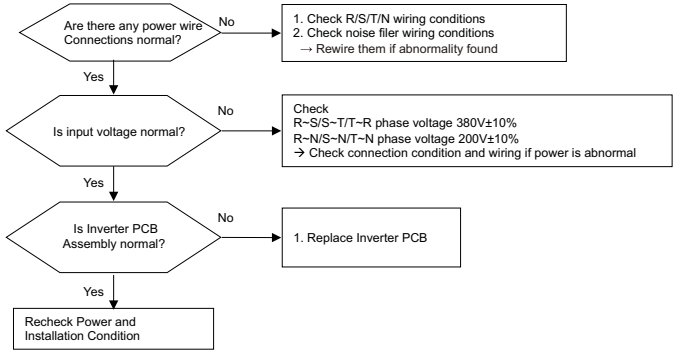
* Fan motor wire connection



❉ When it has heavy snowfall, remove from product and then operate.

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

■ Error diagnosis and countermeasure flow chart

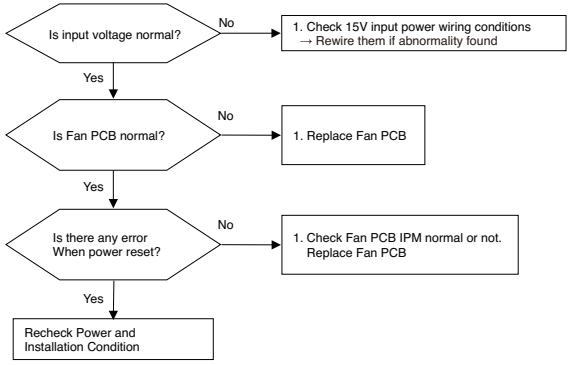


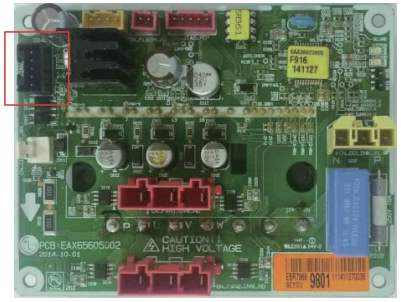
*** Measuring input voltage**

*** Inverter PCB**

Error No.	Error Type	Error Point	Main Reasons
75*	Fan CT Sensor Error	Offset of Micom which which sense the fan motor phase current is not 2.5V ± 0.3V	1. Input Voltage is abnormal (not 15V) 2. Fan PCB assembly defect 3. Power wire open and connecting fault 4. Inverter PCB assembly defect

■ Error diagnosis and countermeasure flow chart

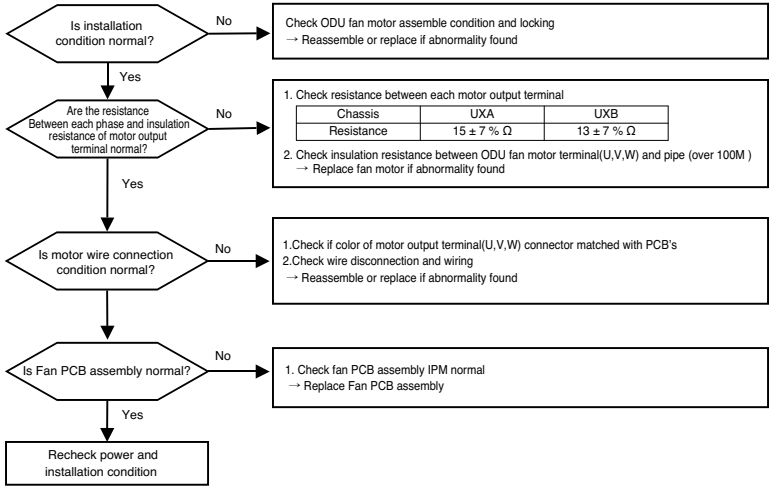




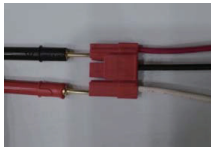
Check DC input power 15V on Inverter PCB.

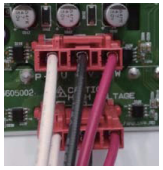
Error No.	Error Type	Error Point	Main Reasons
77*	Fan Over Current Error	Output current is over 7A.	1. Overload operation 2. Fan Motor defect 3. Fan PCB assembly defect 4. Fan Motor connector insert defect 5. Condenser icing or blocking

■ Error Diagnosis and Countermeasure Flow Chart



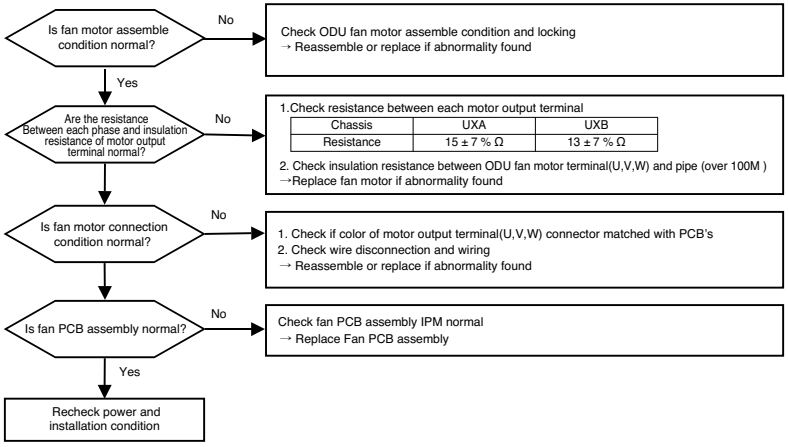
Measuring fan motor phase resistance





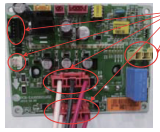
Error No.	Error Type	Error Point	Main Reasons
79*	Fan Starting Failure Error	Fan Motor initial starting failure	1. Fan motor defect/ assemble condition abnormal 2. Fan motor connector misconnection(U,V,W ouput) 3. Fan PCB defect

■ Error Diagnosis and Countermeasure Flow Chart

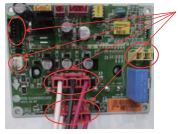


Measuring fan motor phase resistance

Measuring insulation resistance between fan terminal & chassis



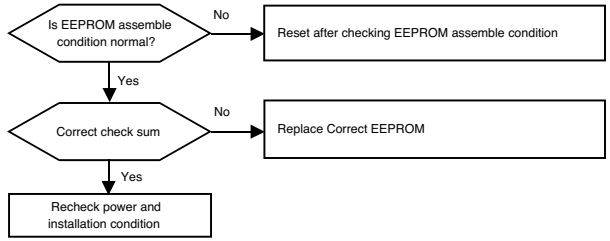
Check Point



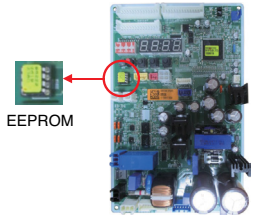
Check the connetion condition

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

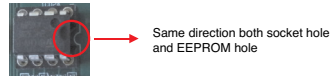
■ Error Diagnosis and Countermeasure Flow Chart



EEPROM Insertion

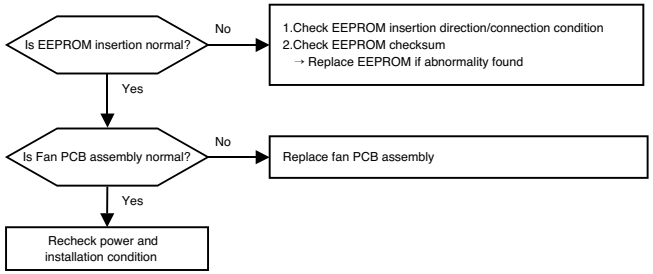


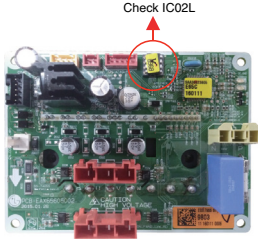
* Note : Replace after power off



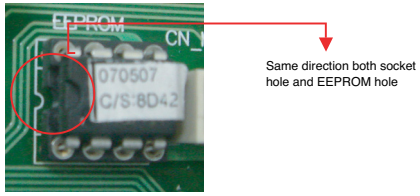
Error No.	Error Type	Error Point	Main Reasons
87*	Fan PCB EEPROM Error	Error occurs when checking the EEPROM checksum as initializing after power is supplied	1. EEPROM bad contact/wrong insertion 2. EEPROM Version is different 3. ODU fan PCB assembly damage

■ Error Diagnosis and Countermeasure Flow Chart





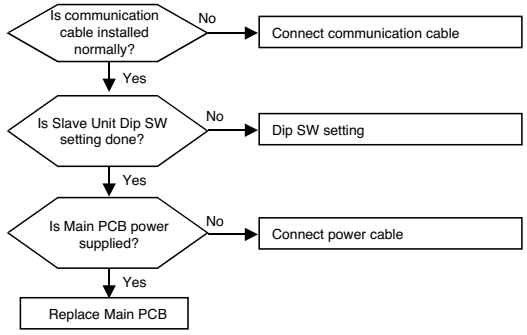
Inverter EEPROM insertion direction



※ Note : Replace after power off

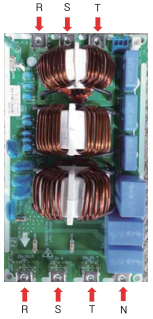
Error No.	Error Type	Error Point	Main Reasons
104*	Communication Error Between Outdoors	Master displays ODU number which is not communicated. Slave displays own error number	1. Loose connection of power cable/ communication cable (Open/Short) 2. Defect of each outdoor unit PCB

■ Error Diagnosis and Countermeasure Flow Chart



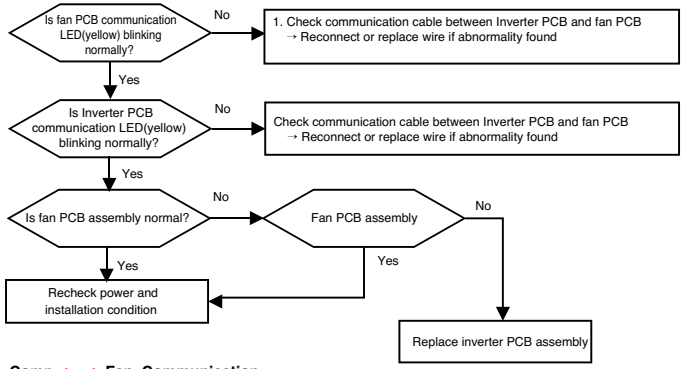
* Measuring input voltage

* Noise filter wiring

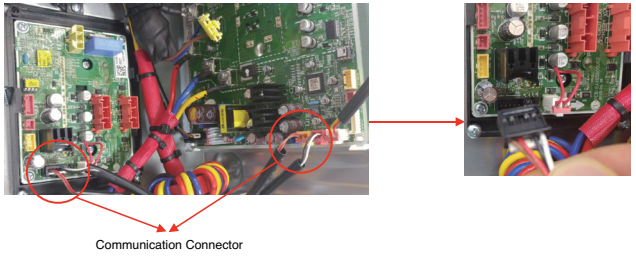


Error No.	Error Type	Error Point	Main Reasons
105*	Communication error (Fan PCB ↔ Inverter PCB)	Fan controller didn't receive signal from Inverter PCB	1. Wrong connection between Comp and Fan PCB 2. Fan PCB power not supplied 3. ODU Comp/Fan PCB defect

■ Error Diagnosis and Countermeasure Flow Chart

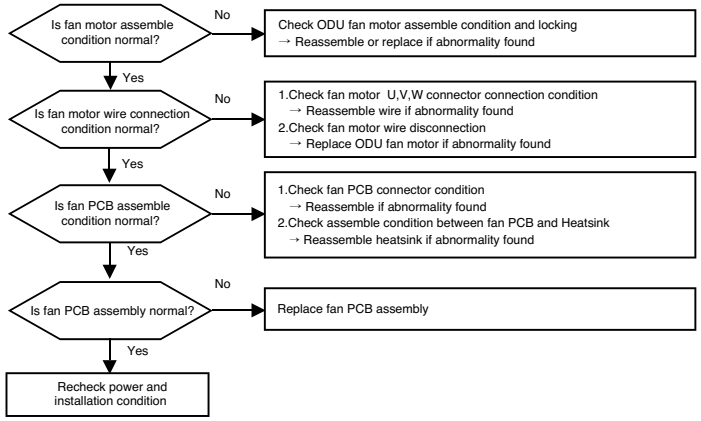


Comp ↔ Fan Communication Connection

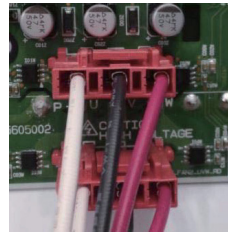


Error No.	Error Type	Error Point	Main Reasons
106*	ODU Fan PCB IPM Fault	IPM protection circuit activation (over current)	1. Overload operation (Pipe clogging/Covering/ EEV defect/Ref. overcharge 2. ODU fan motor assemble condition abnormal (Coil disconnection/Short/Insulation damage) 3. Fan PCB assembly defect

■ Error Diagnosis and Countermeasure Flow Chart

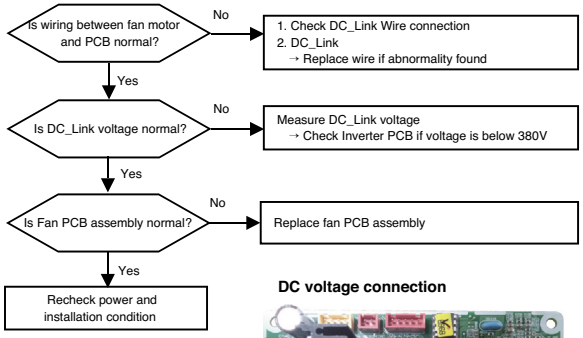


Fan Motor Wire connection

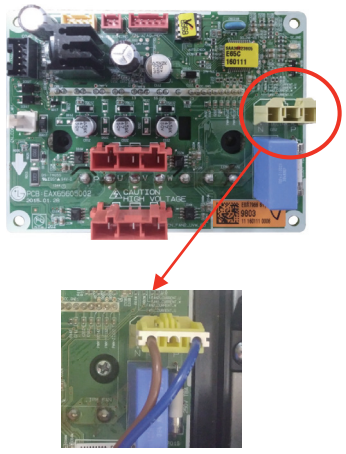


Error No.	Error Type	Error Point	Main Reasons
107*	Fan Control part communication defect	Fan PCB not re-ceived the data from Main PCB	1. Overload operation (Pipe clogging/Covering/ EEV defect/Ref. overcharge 2. ODU fan motor assemble condition abnormal (Coil disconnection/Short/Insulation damage) 3. Fan PCB assembly defect

■ Error Diagnosis and Countermeasure Flow Chart



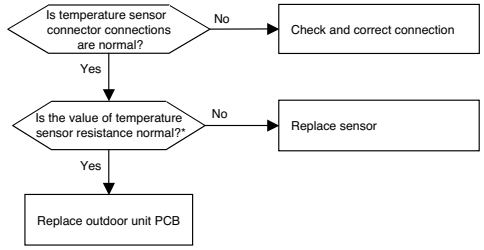
DC voltage connection



DC Volt connected

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

■ Error diagnosis and countermeasure flow chart

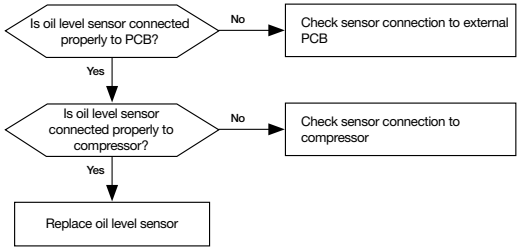


* Sensor resistance 100 kΩover (open) or 100 Ω below (short) will generate error

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

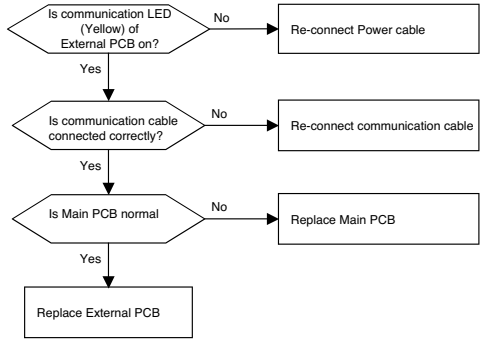
Error No.	Error Type	Error Point	Main Reasons
116*	Compressor lowoil level error	Compressor low oil level	Continuous compressor low oil level Oil level sensor fault

■ Error Diagnosis and Countermeasure Flow Chart



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

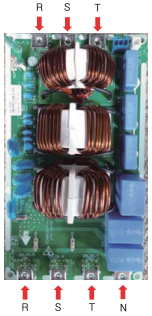
■ Error Diagnosis and Countermeasure Flow Chart



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

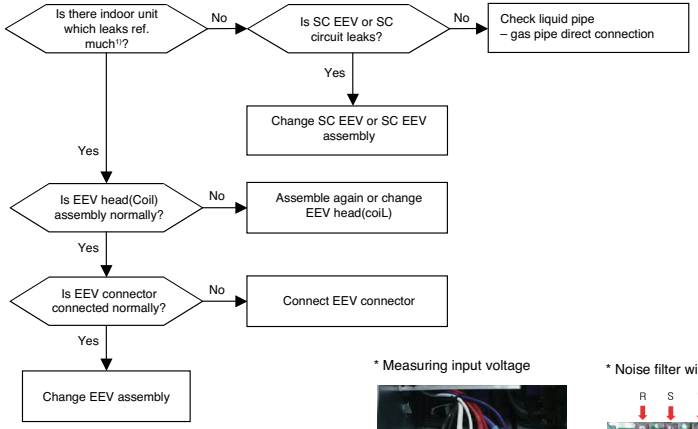
* Measuring input voltage

* Noise filter wiring



Error No.	Error Type	Error Point	Main Reasons
150*	Discharge superheat low	Discharge super–rheat is under 3℃ (liquid back)	Check liquid bypass 1. Individual power of indoor unit is open during operation 2. Indoor unit EEV fault(ref. leak much) 3. Indoor unit EEV connector disconnected. 4. SC EEV fault(ref. leak much) 5. Liquid pipe – gas pipe direct connection

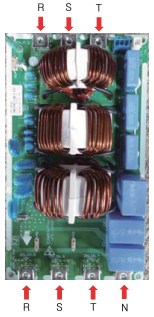
■ Error Diagnosis and Countermeasure Flow Chart



1) Ref. leakage much
: Both Pipe in, pipe out temp. is under 10°C during unit is off(EEV 40pls)
Also, big refrigerant flow noise occured

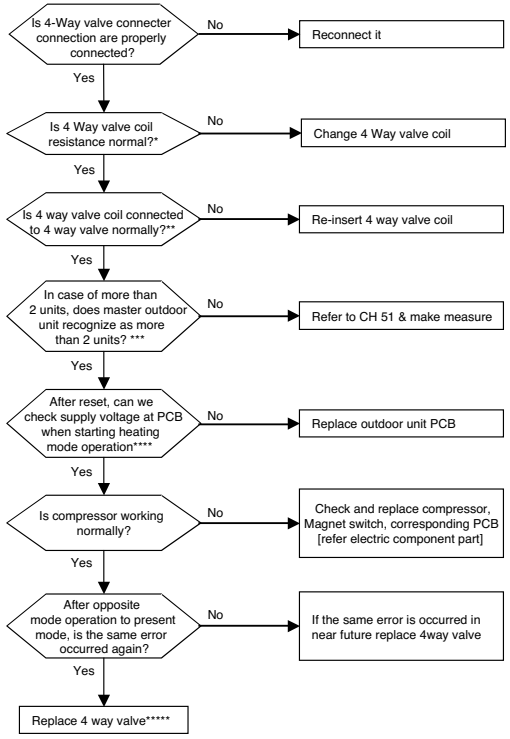
* Measuring input voltage

* Noise filter wiring

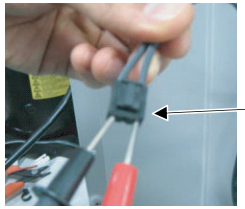


Error No.	Error Type	Error Point	Main Reasons
151*	Function error of outdoor 4way (reversing valve)	Function error of 4way (reversing valve) in Main or Slave outdoor units	1. Wrong operation of 4way valve because of sludge etc. inflow 2. No pressure difference because of com–pressor fault 3. Wrong installation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

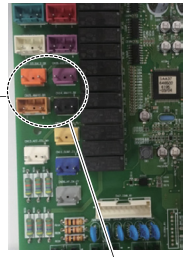
■ Error Diagnosis and Countermeasure Flow Chart



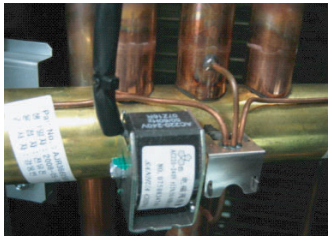
* Measure the resistance of 4way valve



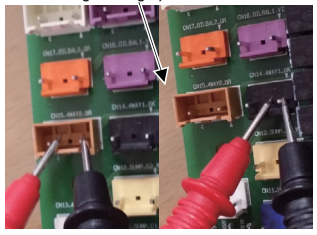
Location of 4way valve connector on Main PCB(marked as 4way,CN09)



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



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

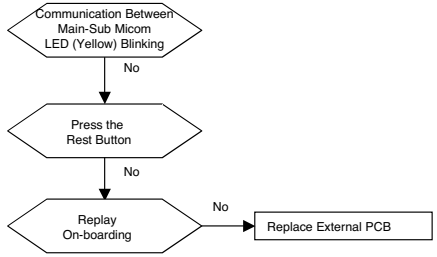


*** When power is supplied in order as follow
(Slave2 → Slave1 → Mater)
ODU information is displayed one after the other at main PCB 7-segment
1. Model ID
→ 8HP : 8, 10HP : 10, 12HP : 12, 14HP : 14, 16HP : 16, 18HP : 18, 20HP : 20
2. Total Capacity
→ Displayed with HP
3. ODU Type
→ Cooling only :1
→ Heat pump :2
4. Power type
→ 380V : 38
5. Model type
→ LTE4:1
→ LTS4:2

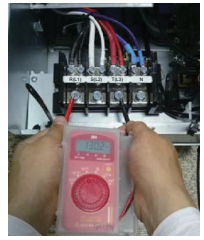
***** Checking method for outdoor unit of 3unit system
(Master + Slave1 + Slave2)
① Close all the SVC valves of high / low pressure
② Operate system
③ Check the difference of high and low pressure with LGMV for each unit (Master, Slave1, Slave2)
④ If there is a unit in which the difference is not increased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

Error No.	Error Type	Error Point	Main Reasons
182*	Communication Error Between Main and Sub Micom of External PCB	Failure Receiving Signal Between Main and Sub Micom	1. Failure Receiving Signal Between Main and Sub Micom

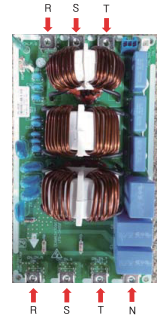
■ Error Diagnosis and Countermeasure Flow Chart



* Measuring input voltage

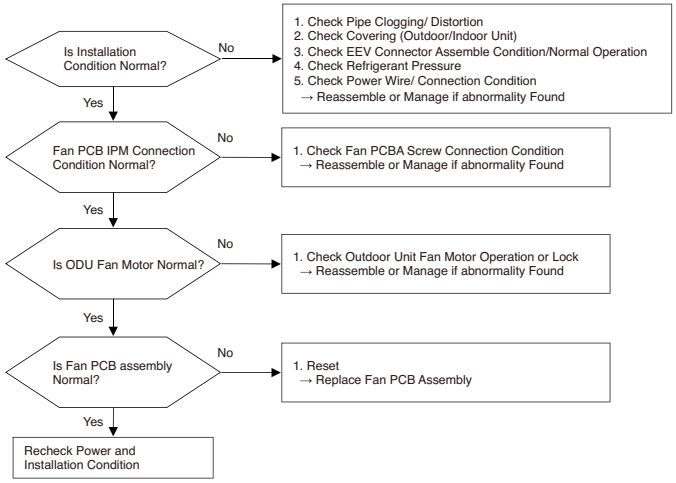


* Noise filter wiring

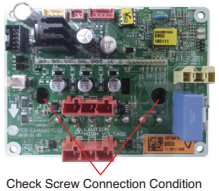


Error No.	Error Type	Error Point	Main Reasons
193*	Fan PCB Heatsink Temperature High	Heatsink Tempera-ture is Over 90℃	1. Fan PCBA IPM Connection Condition Ab-normal 2. Outdoor Unit Fan Motor Operation Abnormal 3. Outdoor Unit Fan PCB Assembly Defect 4. Overload Operation (Pipe Clogging/ Cover-ing/EEV Defect/Ref. Overcharge)

■ Error Diagnosis and Countermeasure Flow Chart



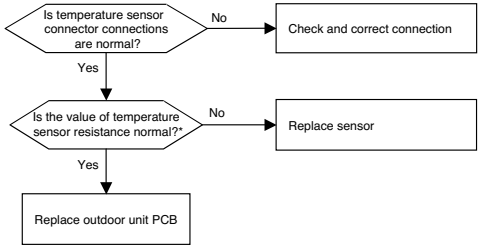
■ Check Fan PCB Screw Connection Condition



Check Screw Connection Condition

Error No.	Error Type	Error Point	Main Reasons
194*	Outdoor unit Fan PCB heatsink temperature sensor error	Outdoor unit Fan PCB heatsink temperature sensor error	1. Defective temperature sensor connection 2. Defective temperature sensor(Open / Short) 3. Defective outdoor unit PCB

■ Error Diagnosis and Countermeasure Flow Chart

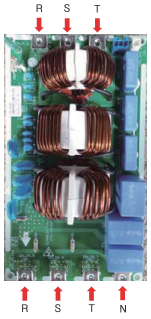


* Sensor resistance 100 kΩ over (open) or 100 Ω below (short) will generate error

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

* Measuring input voltage

* Noise filter wiring



Error No.	Error Type	Error Point	Main Reasons
51C#HR	Excessive connec–tion of indoor unit to HR unit	Indoor unit capacity exceed HR unit ca–pacity specification	1. Wrong connection of communication line or pipe 2. Incorrect operation of HR unit PCB Dip Switch 3. Indoor unit connection each HR unit con–nection port exceeding the capacity

HR: Heat Recovery

■ Error diagnosis and countermeasure flow chart

1) Check if the communication line and pipe between HR unit and indoor unit are correctly connected
2) Check whether DIP switch is set for each connection conditions between HR unit and indoor unit
3) If the indoor unit connected to HR unit is in group control, check if the corresponding capacity is 100 kBtu or less.
4) If the indoor unit connected to HR unit is not in group control, check if the corresponding capacity is 56 kBtu or less (including zoning control)
5) Even after performing the above process, if the same error code occurs, replace the corresponding HR unit PCB
6) After checking and taking action for No.1~5 processes, carry out auto addressing, and carry out pipe search

Error No.	Error Type	Error Point	Main Reasons
2001	Pipe detection error	After the auto oper–ation, if the number of the indoor units detected is different from the number communicating indoor unit	1. HR unit's power cable or communication cable connection defect 2. After auto–addressing, wrong address setting of the indoor unit (Defective indoor power / transmission error and PCB defect) 3. Wrong setting of the HR unit's rotary switch or dip switch 4. HR unit PCB defect

HR: Heat Recovery

■ Error diagnosis and countermeasure flow chart

1) Check the periodic blinking of the HR unit's green LED (transmission LED)
2) When green LED (communication LED) of HR unit blinks regularly,
 2.1) Check input power of HR unit.(220V±10%)
 2.2) After reset of power of outdoor, wait for more than 30 minutes, temperature of pipes will be cool down then, do auto-addressing
 2.2) While power of HR unit is on, check total indoors display 'CH05' or not.(Refer to CH05)
3) When green LED (communication LED) of HR unit blinks regularly, Check setting of rotary switch and dip switch, After reset of power of outdoor and HR unit, wait for more than 30 minutes, temperature of pipes will be cool dow then, do auto-addressing *
4) If indoor unit quantity is different between installed quantity and quantity which check thru piping searching, check pipe installation condition
 Outdoor unit ↔ HR unit ↔ Indoor unit
5) If indoor unit has not been connected to #1 valve of HR unit, set pipes of HR unit manually**
6) If it is not applied as above, set pipes of HR unit as manual
[NB] How to check display method of outdoor main PCB 7-segment ?:
 '88' ➔ Indoor qty which check thru 'Auto-Addressing' ➔ '88' ➔ Indoor qty which check thru 'piping checking'

Error No.	Error Type	Error Point	Main Reasons
201C#HR	HR unit liquid pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open/Short) 3. Defective outdoor unit PCB

Error No.	Error Type	Error Point	Main Reasons
202C#HR	HR unit Sub–cooling inlet pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open/Short) 3. Defective outdoor unit PCB

Error No.	Error Type	Error Point	Main Reasons
203C#HR	HR unit Sub–cooling discharge pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Defective temperature sensor (Open/Short) 3. Defective outdoor unit PCB

■ Error diagnosis and countermeasure flow chart

1) Check connection condition of temperature sensor and lead cable
2) Is value of temperature sensor normal? If not replace sensor
 - Piping temperature sensor : 10°C = 10kΩ : 25°C= 5kΩ : 50°C= 1.8kΩ
3) If connection of sensor and value is correct, replace outdoor unit PCB

■ HR unit error display No.

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

■ Example of HR unit error display.

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

C: HR unit

#: HR unit Nuber

Error No.	Error Type	Error Point	Main Reasons
204C#HR	Transmission error between the HR unit and outdoor unit	Transmission error between the HR unit and outdoor unit	1. Defective connection in HR unit power supply and communication connection 2. Wrong setting of the HR unit rotary switch and dip switch 3. Defective HR unit PCB

■ Error diagnosis and countermeasure flow chart

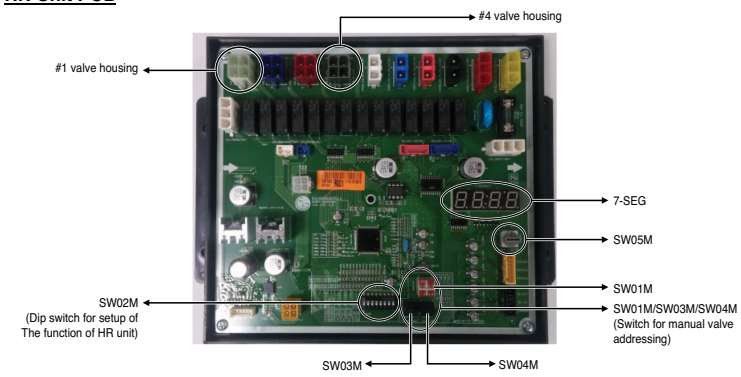
1) Check connection between power cables and communication cables, check communication green LED blink of HR unit PCB

2) If communication green LED blink of HR unit PCB is normal, check setting of rotary switch of HR unit and dip switch(Refer to CH200),
Reset power of outdoor and HR unit
(If communication error of HR unit occurs, it can't be released until reset of outdoor power)

3) If communication green LED blink of HR unit PCB is abnormal(not blinking,just on), check communication condition of total indoor units(Refer to CH05)
If communication green LED blink of HR unit PCB is abnormal(not blinking, just on) even if communication condition is normal, replace HR unit PCB

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

HR Unit PCB



Error No.	Error Type	Error Point	Main Reasons
205C#HR	Communication error between HR unit and the upgraded 485 modem	4 series upgraded 485 communication error between HR unit and HR unit modem	1. Wiring defect between HR unit and upgraded 485 modem 2. Defect of the upgraded 485 PCB modem 3. Defect of the HR unit PCB

■ Error diagnosis and countermeasure flow chart

1) Check the communication connection between HR unit and the upgraded 485 modem, and check for the red LED on

2) Reset the outdoor unit and the power of HR unit if the red LED of the upgraded 485 modem is on

3) Replace the upgraded 485 modem if the red LED is flashing at the upgraded 485 modem

4) Replace the HR unit PCB if the red LED of the upgraded 485 modem is flashing even after replacing the upgraded 485 modem.

Error No.	Error Type	Error Point	Main Reasons
206C#HR	Duplicate address error of HR unit	When the HR unit address is set duplicated at the 4 series upgraded 485 communication	1. Defect of power cable of HR unit or communication line connection 2. Error of address allocation rotary switch setting of HR unit 3. Defect of the HR unit PCB

■ Error diagnosis and countermeasure flow chart

1) Check whether the rotary switch setting of HR unit PCB is set differently for HR units

2) Reset the outdoor unit and the power of HR unit by setting the rotary switch of HR unit PCB differently for HR units

3) Perform the auto addressing again after performing the number 2 process

4) Replace the corresponding HR unit PCB if the same error code is occurred even after performing the number 3 process

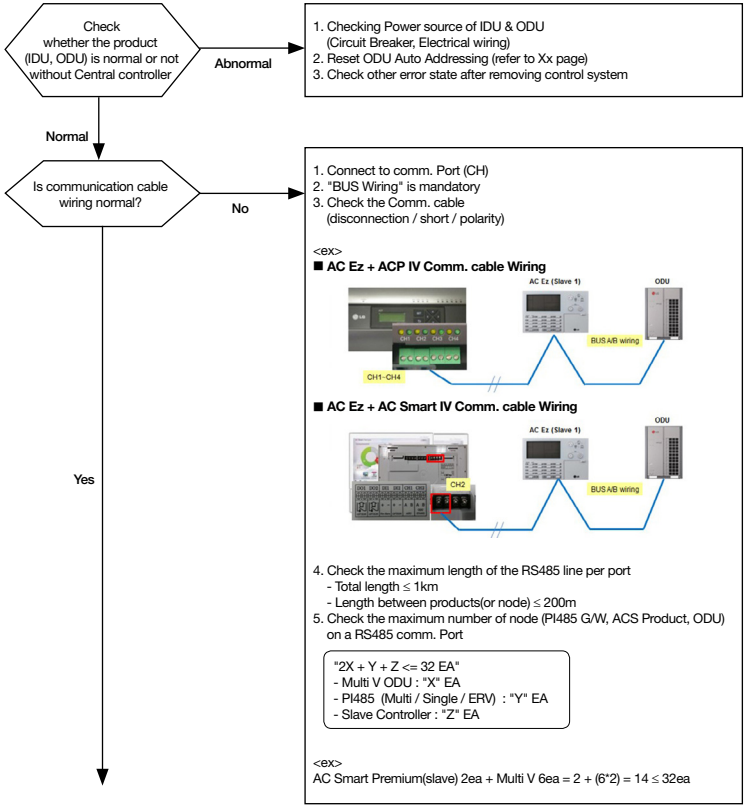
• The above error code is only occurred at the upgraded 485 communication (9600bps communication)

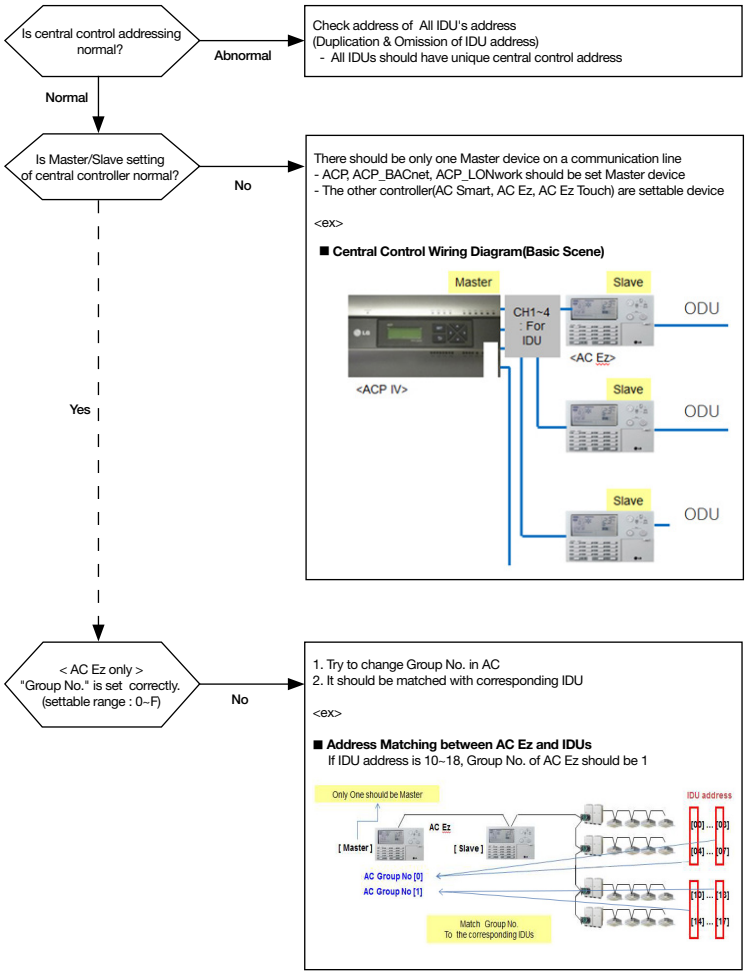
• Refer to the installation manual of the outdoor unit for the address setting to HR unit rotary switch for HR units

Upgraded 485 Modem

Error No.	Error Type	Error Point	Main Reasons
242*	Network Error	Network error of central controller	1. Communication Wiring defect (Central con–troller – ODU) 2. Communication defect between remote con–troller and indoor unit 3. Indoor unit addressing setting error on central controller

■ Error Diagnosis and Countermeasure Flow Chart





MULTI V 5

Ⅲ. Trouble Shooting Guide

Checking Method for Key Components

1. The Phenomena from Main Component Failure

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

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

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

2. Compressor

2.1 Failure Judge Method

1. Error display (CH21, CH22, CH26, CH29)
   - Failure to restart after power reset
   - Main power supply failure from inverter board to compressor
   - Compressor input current is normal but compressor fails to start with electric noise from inverter board
   - CH29 in normal operation and cycle

2. Phase current , input current hunting
   - The phase current, input current value is hunting more than 5A in stable state of high / low pressure and compressor Hz

3. Coil resistance (U–V, V–W, W–U) and insulation resistance measurement
   - Insulation resistance : 50MΩ or more
   - Coil resistance : refer to below

JQC068MA*

Temp.	25 ℃	75 ℃
U–V	0.216 ± 7 % Ω	0.258 ± 7 % Ω
V–W	0.216 ± 7 % Ω	0.258 ± 7 % Ω
W–U	0.216 ± 7 % Ω	0.258 ± 7 % Ω

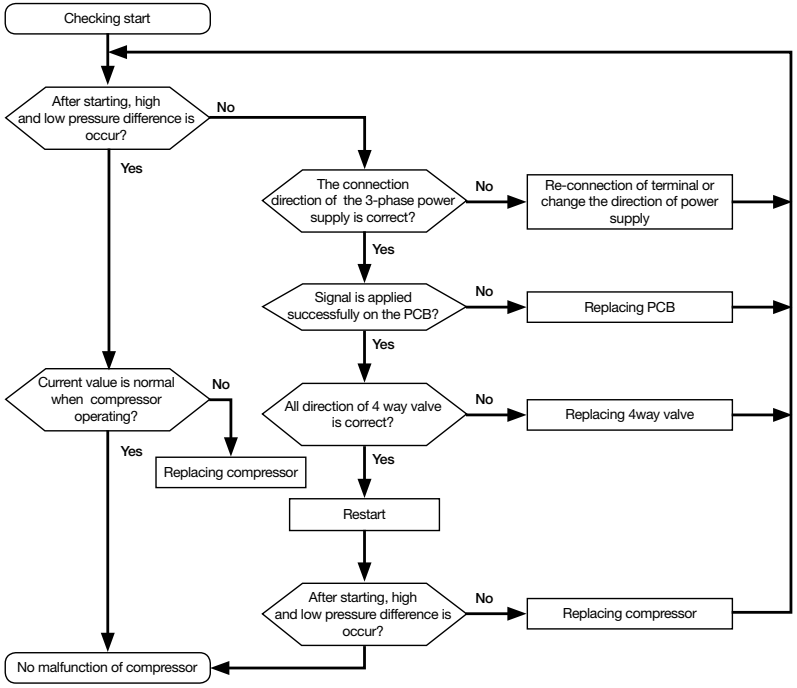
JQC048MA*

Temp.	25 ℃	75 ℃
U–V	0.302 ± 7 % Ω	0.360 ± 7 % Ω
V–W	0.302 ± 7 % Ω	0.360 ± 7 % Ω
W–U	0.302 ± 7 % Ω	0.360 ± 7 % Ω

2.2 Failure Cause

- Failure to obtain discharge superheat (refrigerant overcharging)
- High discharge temperature (refrigerant shortage)
- Failure to obtain high and low pressure difference
- Defective compressor
- Foreign substance inflow
- Overload operation
- Nitrogen / Vapor inflow and poor vacuum
- Defective oil return valve
- Oil return piping blocked
- Defective VI EEV
- Defective oil balancing valve
- Oil shortage due to oil leakage
- Lack of oil due to frequent Thermo On / Off

2.3 Checking Method (Flow Chart)



2.4 Process of Replacing the Compressor

Please follow the below process when you replace the compressor.

- Before replacing the compressor, check whether the failure of the compressor.
- Change the oil for compressor after replacing the compressor for 2~3 times.

1. check the turn off sign of the main power supply.
2. Remove the refrigerant with manifold gauge connecting to service valve.

> ⚠ **Caution** Please release gradually the refrigerant, because there may be released oil mixed with the refrigerant.

3. Remove the terminal cover of compressor and power supply cable.
4. Please remove the crank case heater and discharge temperature sensor of the compressor.
5. Please remove the mounting nut of the compressor.
6. Please be separated by heating the welded portion of the pipe connected to the compressor.
7. Replace the compressor.
8. Please reconnect the pipe that had been separated by #7 to compressor by welding.
9. After closing the service valve of liquid pipe & gas pipe, check whether there is a site of the leak by injecting nitrogen gas(38 kgf/cm² g) through the check joint of the high-pressure side and low pressure side.
10. Remove the nitrogen gas.
11. Open the service valve (liquid pipe and gas pipe) of the outdoor unit and make a vacuum.
12. Please install the insulation material and the discharge temperature sensor of compressor.
13. Connect power supply cable to terminal of compressor.

> ⚠ **Caution** Please be aware that not occur the reverse phase & loss of phase when connecting the phase.

14. After complete of vacuum processing, please charge the refrigerant by calculating the additional amount of refrigerant according refrigerant basic amount of the enclosed, outdoor unit charging factor, the pipe length.
15. After confirming once again of the power supply line connection is correct to the terminals of the compressor, please check the insulation resistance. Please make sure that you cover the compressor terminal cover, turn on the power, and check the current flows through the crankcase heater.
16. Make sure that the service valve of liquid pipe side and gas pipe side has been opened.
17. Please check the operation status after operating all IDU.

2.5 Precautions of Replacement

1. Be sure to use the compressor suitable for the model
2. Be careful not to damage the pipe
3. Do not enter foreign substances into the compressor
4. Check U, V, W Color of the compressor terminals
5. Use screw only for the compressor
6. When replacing the compressor, add oil if the oil has flowed too much
7. Use only regulated oil specified in this guide
8. Vacuum over 4 ~ 5 hours
9. Perform pipe cleaning with nitrogen
10. Charging with regulated refrigerant specified in this guide

2.6 Checklist after Replacement

1. Check whether there is any abnormality when the cycle is stabilized at cooling or heating mode.
   (Suction / Discharge superheat degree, Input current, Phase current, Pressure ratio, Oil sensor, etc.)
2. Check current Hz control according to target Hz
3. Check that the target high / low pressure
4. Check the amount of refrigerant
5. Check the abnormal noise during running

2.7 Compressor Specification

The specification of compressor being adapted to Multi V is below.
When the compressor is not working, please check the compressor referring to the below specification.

	Heat Pump & Heat Recovery	
Model	JQC048MAA	JQC068MAA
Manufacturer	LG	LG
Type	BLDC inverter Scroll	BLDC inverter Scroll
Compression Volume (cm^3/rev)	43.8	62.1
Refrigerating machine oil	FVC68D	FVC68D
Weight (kg)	31	31.8
Internal diameter of inlet (mm)	ID22.6 ±0.2	ID22.6 ±0.2
Internal diameter of outlet (mm)	ID16.05 ±0.2	ID16.05 ±0.2

3. EEV

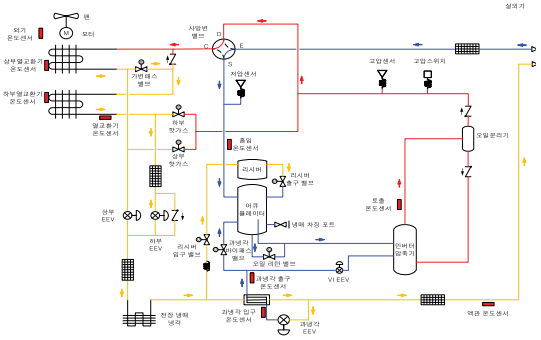
3.1 Failure Judge Method

■ Cooling

1. Main EEV
   1) Basic control
      – Variable path mode : Upper EEV Full Close / Lower EEV Full Open
      – Low temperature cooling mode : Upper EEV Full Open / Lower EEV Close
   2) Failure phenomenon
      ① Upper EEV leakage
      All the refrigerant flows into the upper EEV and decrease the capacity of the lower heat exchanger.
      → SC EEV Open to ensure SC degree
      ② Lower EEV leakage
      Flow rate is concentrated in check valve → Excessive pressure loss
      → Indoor refrigerant noise occurs

2. SC EEV
   1) Basic control : SC / SH control
   2) Failure phenomenon
      ① SC EEV open failure : Outdoor SC can not be controlled
      → Indoor refrigerant noise occurs due to insufficient SC
      → Temperature is not lowered even if EEV is opened when discharge temperature emergency control

3. VI EEV
   1) Basic control : Inverter start control, Vapor Injection control
   2) Failure phenomenon
      ① VI EEV open failure : CH21 error display, Compressor failure
      → Failure to reduce compressor different pressure during start-up
      ② VI EEV Close failure : Failure to obtain the degree of discharge superheat, CH21, Compressor failure → Liquid compression



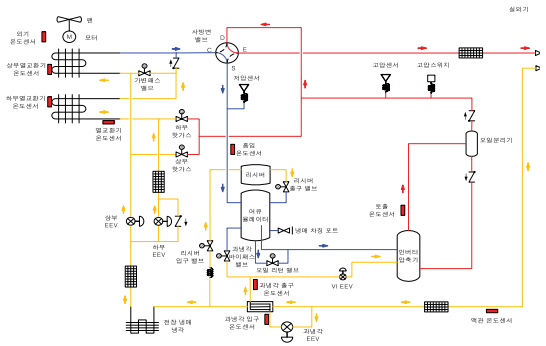
* SC : Sub Cooling, SH : Super Heating

■ Heating

1. Main EEV
   1) Basic control : Suction the degree of superheat control
   2) Failure phenomenon
      ① Upper EEV open failure
      Excessive drop of low pressure, Upper and lower heat exchanger temperature difference 10 ℃ or more
      → The refrigerant does not flow through the upper heat exchanger and the evaporation amount is insufficient.
      ② Lower EEV open failure
      Excessive drop of low pressure, Upper and lower heat exchanger temperature difference 10 ℃ or more
      → The refrigerant does not flow through the lower heat exchanger and the evaporation amount is insufficient.

2. SC EEV
   1) Basic control : Inverter emergency control
   2) Failure phenomenon
      ① SC EEV Open failure : EEV is open but discharge temperature is not lower
      → Open when compressor discharge temperature rises

3. VI EEV
   1) Basic control : Inverter start control, Vapor Injection control
   2) Failure phenomenon
      ① VI EEV Open failure : CH21, Compressor failure
      → Failure to reduce compressor different pressure during start-up
      ② VI EEV Close failure : Failure to obtain the degree of discharge superheat, CH21, Compressor failure
      → Liquid compression



* SC : Sub Cooling, SH : Super Heating

■ Physical Failure Judge Method

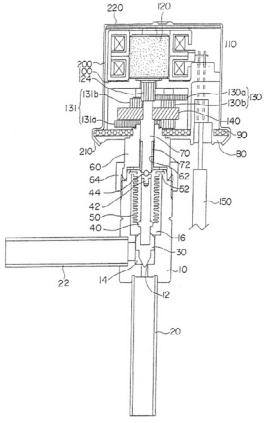
1. Main PCB reset to initialize EEV
   : Full Open (1,950 pls) → Full Close (1,950 pls + 200 pls) → Open (32 pls – 4Way valve on) or Open (1 950 pls – 4Way valve off)
   → EEV operation sound and vibration are larger than the normal operation state when close signal is entered in full close state
   → When the operation signal (close and open) is transmitted while the EEV mechanism is in the constrained state, the operation sound and the vibration are larger than the normal operation state
   * If EEV is normal and reset several times, it is reset to full close state

2. Check the resistance between coil terminal
   * EEV Resistance Spec

Coil terminal color		Resistance
red	white	150Ω ± 15
red	orange	
brown	yellow	
brown	blue	
white	orange	
yellow	blue	

3. Use the EEV failure judgment kit

< 기어식 EEV >



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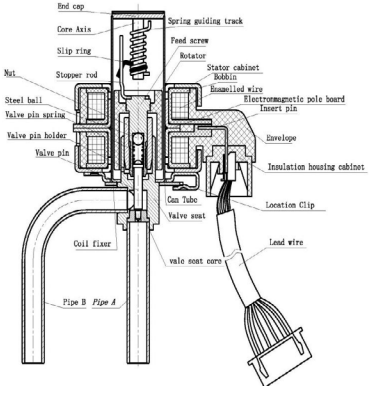
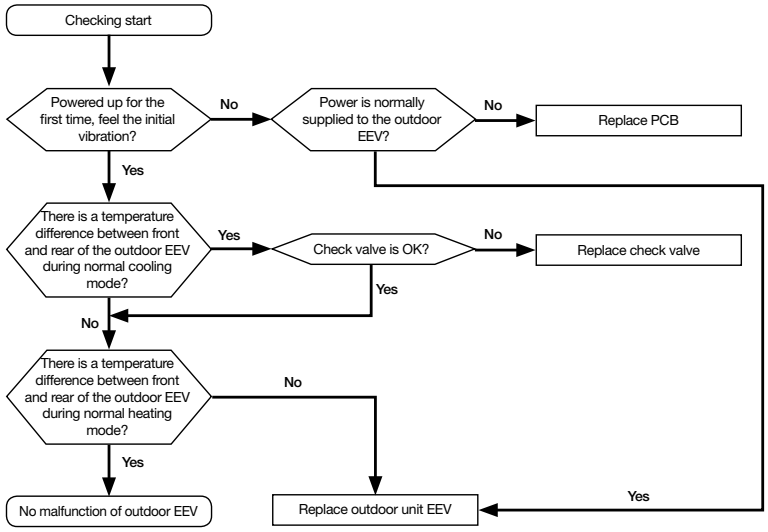
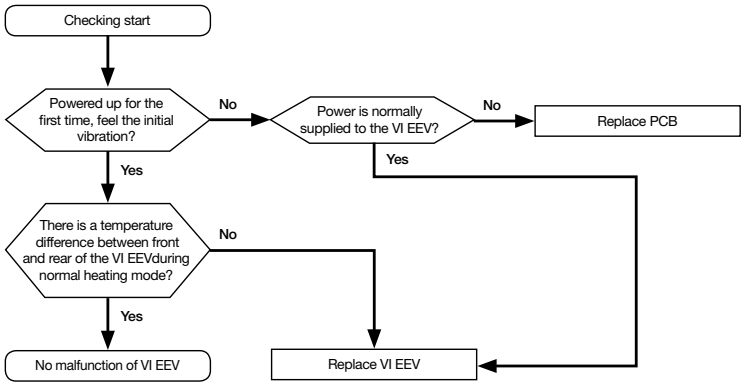


3.2 Checking Method (Flow Chart)

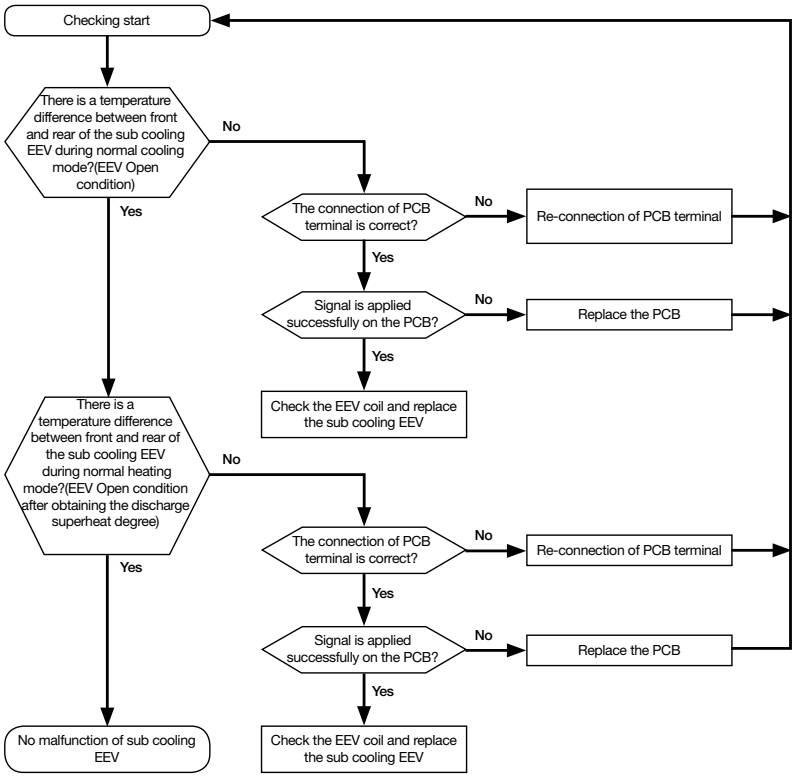
■ Outdoor Unit EEV



■ VI EEV



■ Sub Cooling EEV



3.3 Precautions of Replacement

1. EEV should be judged correctly and replaced
2. Replaced EEV should be returned for cause analysis
3. Do not transfer heat to EEV body when welding
4. In case use the refrigerant after welding, be careful welding crack and the body damage
5. Be careful not to damage terminals when PCB is fastened
   (Contact failure prevent)
6. PCB reset after replacement and check operation sound is normal
7. Vacuum at least 4 ~ 5 hours after welding.
8. After vacuum processing, please charge the refrigerant by calculating the additional amount of refrigerant according refrigerant basic amount of the enclosed, outdoor unit charging factor, the pipe length.

4. Solenoid Valve

Check that the output signal of the control board matches the operation of the solenoid valve.

4.1 Variable Path Valve

1. Basic control
   - Base : Off
   - Cooling mode : Open
   - Low temperature cooling mode : Close
   - Heating mode : Close

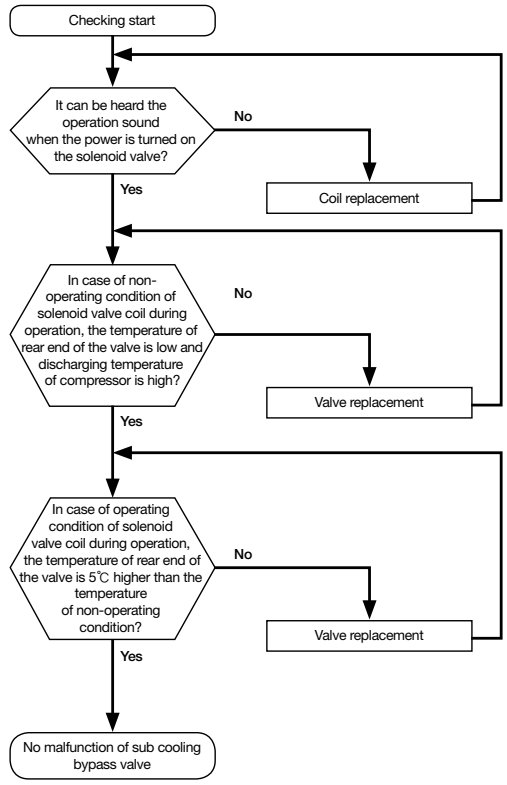
2. Failure Phenomenon
   1) Open Failure
      : The upper EEV is closed and the refrigerant flow is blocked. So, the high pressure rises sharply
      → CH34, High-pressure switch ON, Main PCB Off

   2) Close Failure
      : The refrigerant passing through the upper EEV does not go to the heat exchanger but enters accumulator through the variable path valve
      → Heat capacity decrease, Excessive temperature difference between upper / lower heat exchanger (more than 15 degrees)

4.2 Sub Cooling Bypass Valve

1. When the compressor starts, the sub cooling bypass valve is ON for minute. At this time, check whether the noise or pipe vibration occurs In solenoid valve
2. Turn on the valve 5 seconds after stopping the compressor to quickly remove the difference of high / low pressure
3. If the compressor suction pipe temperature drops below target temperature, turn on the sub cooling bypass valve.
4. Depending on the cycle status, the sub cooling bypass valve may remain ON. This is not a malfunction.
5. The change of operation status by the solenoid valve operation can be confirmed by the temperature before and after the bypass pipe and the refrigerant sound.
6. Insulation resistance in the state of connecting the valve to coil should be over 100mΩ when measure it with DC mega tester(DC 500V)

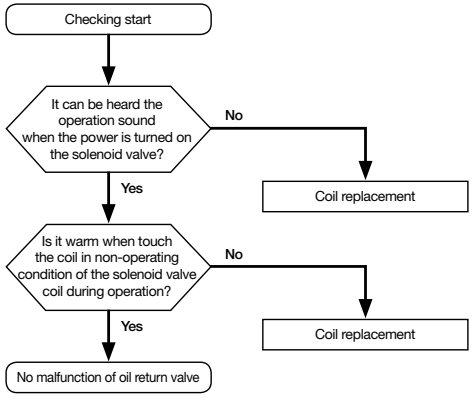
■ Checking Method (Flow Chart)



4.3 Oil Return Valve

1. It is located at the bottom of the accumulator and operates after the compressor running to supply oil to the compressor.
2. When the compressor starts operating, oil solenoid valve will be ON for minutes. check if there is operation noise on the solenoid valve or pipe vibration
3. It turns ON right after the compressor stop
4. Solenoid valve can turn ON and OFF repeatedly by the condition of cycle operation. this is not a malfunction.
5. Insulation resistance in the state of connecting the valve to coil should be over 100mΩ when measure it with DC mega tester(DC 500V)

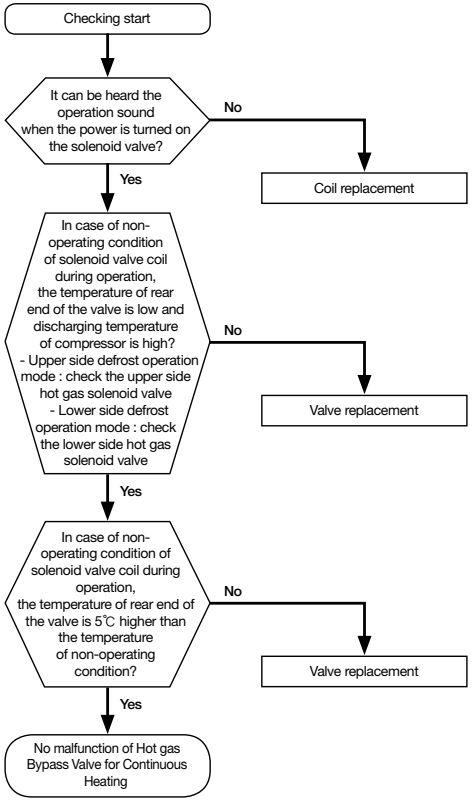
■ Checking Method (Flow Chart)



4.4 Hot gas Bypass Valve for Continuous Heating

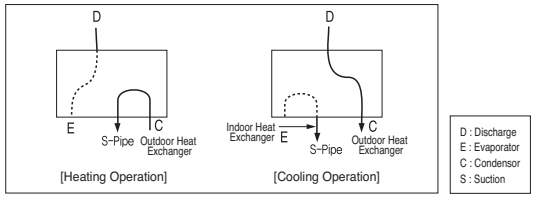
1. Defrost operation eliminates ice attached on heat exchanger, recovering performance of heat exchanger.
2. Two solenoid valves will be on by turns in the extent of 6 minutes when separated defrosting is on.
3. It will be turned of right after the end of separated defrosting.
4. The change of the operation condition by the operation of solenoid valve can be checked by the before and behind temperature of bypass piping and the sound of refrigerant.
5. Insulation resistance in the state of connecting the valve to coil should be over 100mΩ when measure it with DC mega tester(DC 500V).

■ Checking Method (Flow Chart)



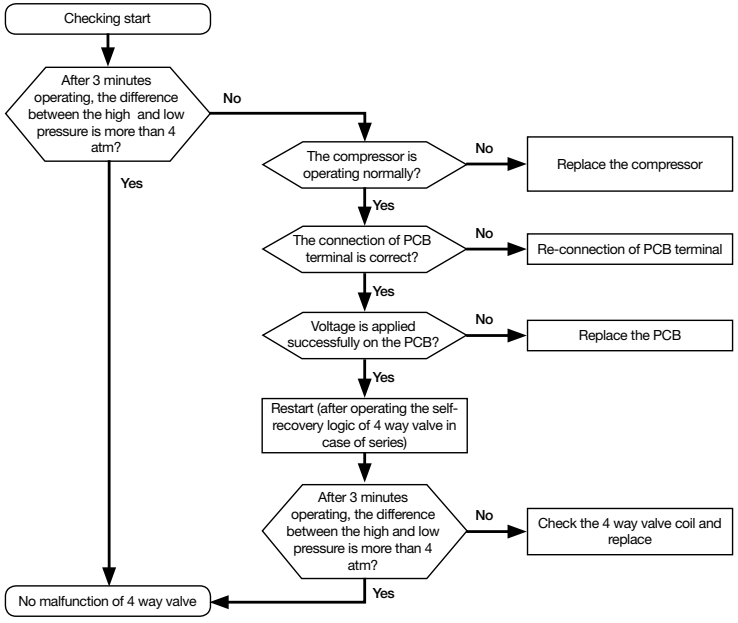
5. 4Way Valve

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

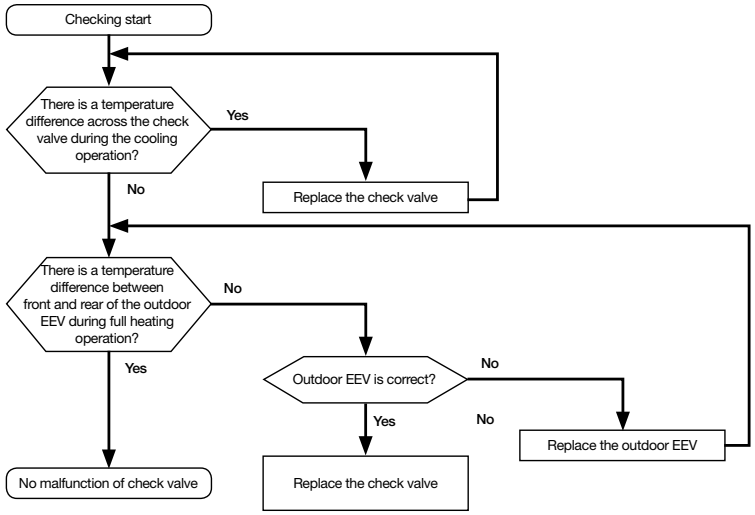


6. Insulation resistance in the state of connecting the valve to coil should be over 100mΩ when measure it with DC mega tester(DC 500V).

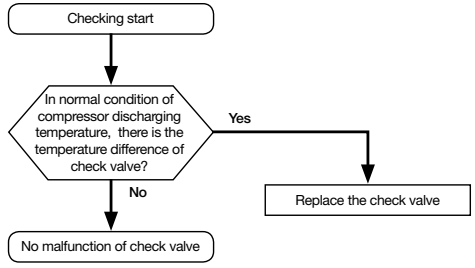
■ Checking Method (Flow Chart)



6. Check Valve (Outdoor EEV Check Valve)



7. Check Valve (Oil Separator)



8. Outdoor Fan & Fan Motor

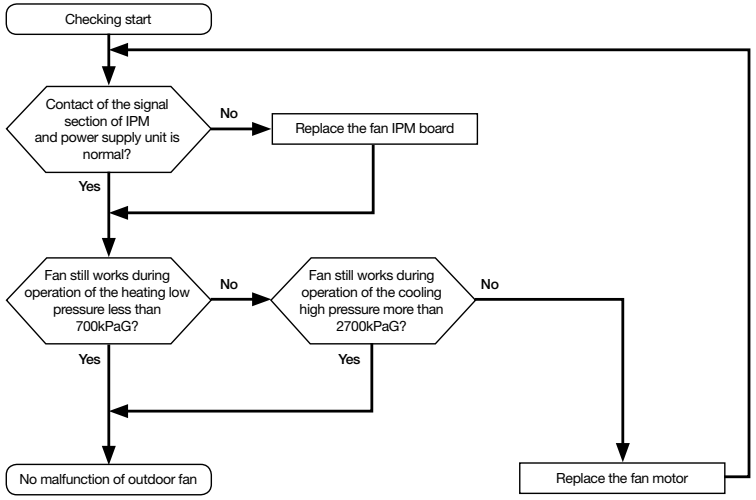
8.1 Outdoor Fan

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

8.2 Fan Motor

Checking Item	Symptom	Countermeasure
1. The fan motor does not operate. 2. Vibration of the fan motor is large	1) When power supply is abnormal	* Modify connection status in front of or at the rear of the breaker, or if the power terminal console is at frosting condition.
		* Modify the power supply voltage is beyond specified scope.
	2) For wrong wiring	* For following wiring. 1. Check connection status. 2. Check contact of the connector. 3. Check that parts are firmly secured by tightening screws. 4. Check connection of polarity. 5. Check short circuit and grounding.
	3) For failure of motor	* Measure winding resistance of the motor coils. – UX3 : 19Ω ±7 %(@25℃) – UX2 : 14.2Ω ±7 %(@25℃)
	4) For failure of circuit board	* Replace the circuit board in following procedures if problems occur again when powering on and if there are no matters equivalent to items as specified in above 1) through 3).(Carefully check both connector and grounding wires when replacing the circuit board) 1. Replace only fan control boards.If starting is done, it means that the fan control board has defect. 2. Replace both fan control board and the main board. if starting is done, it means that the main board has defect. 3. If problems continue to occur even after countermeasure of No.1 and No.2, it means that both boards has defect.

8.3 Checking Method (Flow Chart)



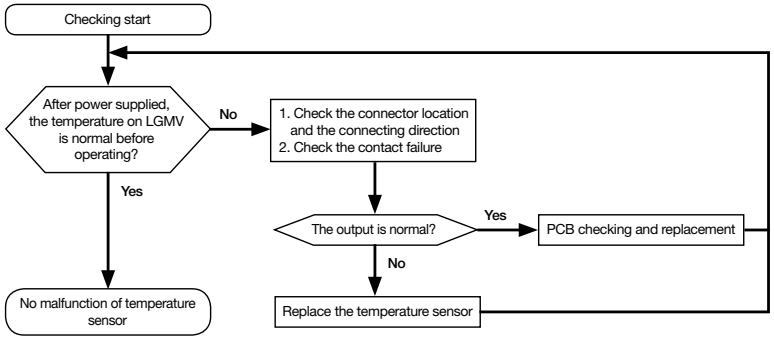
9. Temperature Sensor

1. Check the condition of installation and the contact of temperature sensor.
2. Check whether the connector contact of temperature sensor is normal.
3. Measure the resistance of temperature sensor.

	TH1	TH2	TH3
Resistance	10KΩ±1%(25℃)	5KΩ±1%(25℃)	200KΩ±1%(25℃)
	1.07KΩ±3.3%(85℃)	535KΩ±3.3%(85℃)	28KΩ±7.7%(85℃)

* TH1 : Outdoor temperature sensor
* TH2 : Pipe temperature sensor
* TH3 : Discharge pipe(D-pipe) temperature sensor

■ Checking Method (Flow Chart)

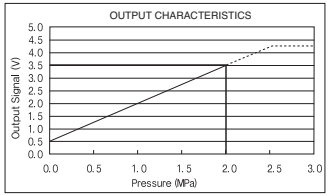


10. Pressure(High/Low) Sensor

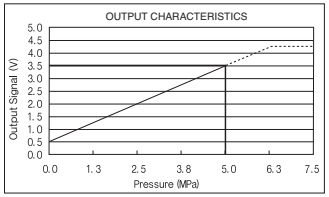
Connect manifold gauge to the service valve of outdoor unit, and compare the output of high pressure sensor to the output of low pressure sensor to detect the defect.

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

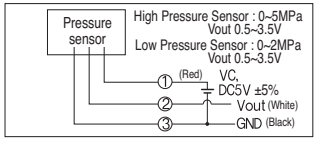
<Low Pressure Sensor>



<High Pressure Sensor>

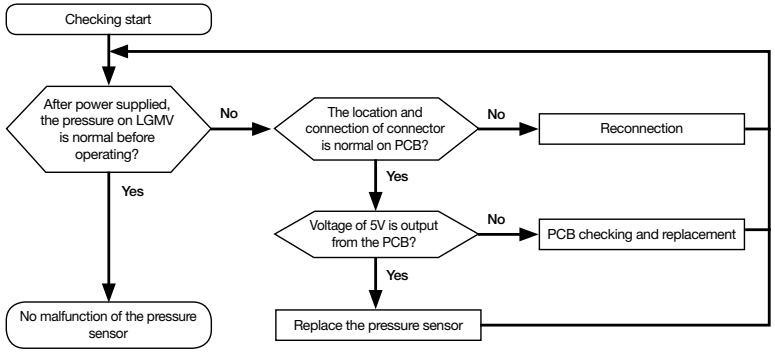


1) If the pressure of manifold gauge is 0~1kg/cm^2, it indicates the pressure got lower due to the leakage of refrigerant. Find the place of leakage and fix it.
2) If the difference of the outputs of high and low pressure is in the range of 1kg/cm2, the pressure sensor is normal.
3) If the difference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



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

■ Checking Method (Flow Chart)

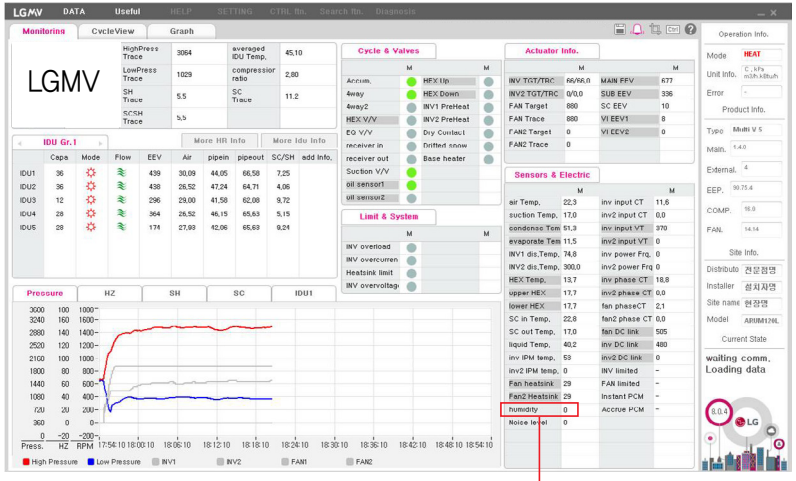


11. Humidity Sensor

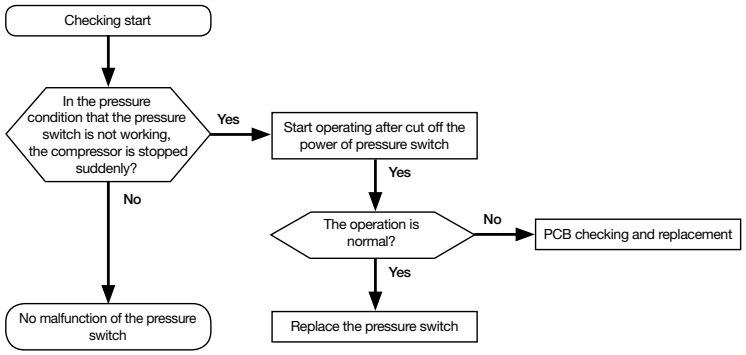
If the humidity sensor has problem such as sensor open or short, no error display is shown at outdoor unit.

Normally LGMV shows humidity ratio such as below display box of LGMV.
However, if the humidity sensor open/short occurred, it displays as "0".
In case of the sensor fault occurred, the system is operated not as the dual sensing SLC (Temperature + Humidity) but as the SLC (Only Temperature)

This means that system is normally operated without humidity function even if humidity sensor has problem.



12. Pressure Switch



⚠ Caution When the long-term operation to turn off the power of the pressure switch, you can receive a fatal damage to the components and piping systems.

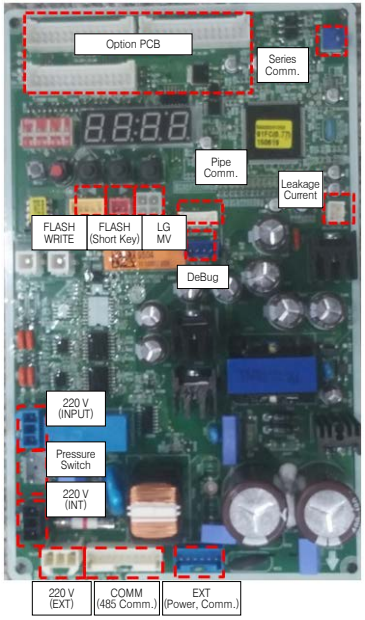
13. Main PCB

13.1 Failure Judge Method

1. Error code check

Error Code	Error diagnosis
–	· Check restart after power reset · Check main PCB power supply.
CH50	· Check N-phase wrong connection of power supply.
CH53	· Check communication PCB (Indoor/Outdoor) connection harness (24pin), Main – External PCB communication harness(6pin, Blue) connection condition
CH86	· Check the EEPROM inserting (direction, pin break, etc.) condition
CH52, CH57, CH105	· Check Main – Inverter PCB communication harness(2pin, Blue) wrong connection condition
CH145	· Check Main – External PCB communication harness(6pin, Blue) wrong connection condition

2. Main PCB check
Check the power line connection status because it is not displayed in 7 segment



13.2 Failure Cause

1. High voltage (T–N more than 484V, N phase wiring fault) → CH50
2. Rainwater inflow by Control box / Front Panel / Service port open, Control box screw loosening
3. Part short by foreign substance
4. Defective PCB / Diode / Resistance / Capacitor / Regulator

13.3 Precautions of Replacement

1. Be sure to use the main PCB suitable for the model (Check P/No)
2. Be sure to turn off the power and wear insulated gloves before touching the PCB.
3. Use box or bag only for PCB.
4. If on–boarding is required after replacement, check the program and EEPROM C/Sum (especially when using an alternate Main PCB)

13.3 Check Point after Replacement

1. Check whether there is any abnormality when the cycle is stabilized at cooling or heating mode.
2. Check current Hz control according to target Hz
3. Check that the target high / low pressure is reached

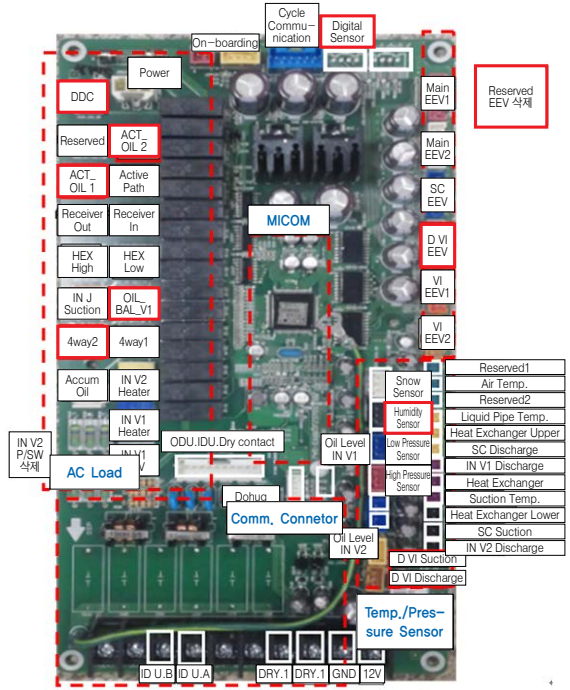
14. External PCB

14.1 Failure Judge Method

1. Error code check

Error Code	Error diagnosis
CH05, CH53, CH104, CH237, CH238	· Even after checking the connection condition of indoor and outdoor communication lines (shield wire, unshield wire)
CH32, CH33, CH34, CH35, CH36, CH41, CH42, CH43, CH44, CH45, CH46, CH47, CH113, CH114, CH115, CH116, CH151, CH153, CH154	· Even after replace each temperature sensor, pressure sensor, and valve replacement.
CH145	· Even after checking Main – External PCB communication harness(6pin, Blue) connection condition

2. External PCB check



14.2 Failure Cause

1. High voltage (T–N more than 484V, N phase wiring fault) → CH50
2. Rainwater inflow by Control box / Front Panel / Service port open, Control box screw loosening
3. Part short by foreign substance
4. Defective PCB / Diode / Resistance / Capacitor / Regulator

14.3 Precautions of Replacement

1. Be sure to use the main PCB suitable for the model (Check P/No)
2. Be sure to turn off the power and wear insulated gloves before touching the PCB.
3. Use box or bag only for PCB.
4. If on–boarding is required after replacement, check the program and EEPROM C/Sum (especially when using an alternate Main PCB)

14.3 Check Point after Replacement

1. Check whether there is any abnormality when the cycle is stabilized at cooling or heating mode.
2. Check current Hz control according to target Hz
3. Check that the target high / low pressure is reached

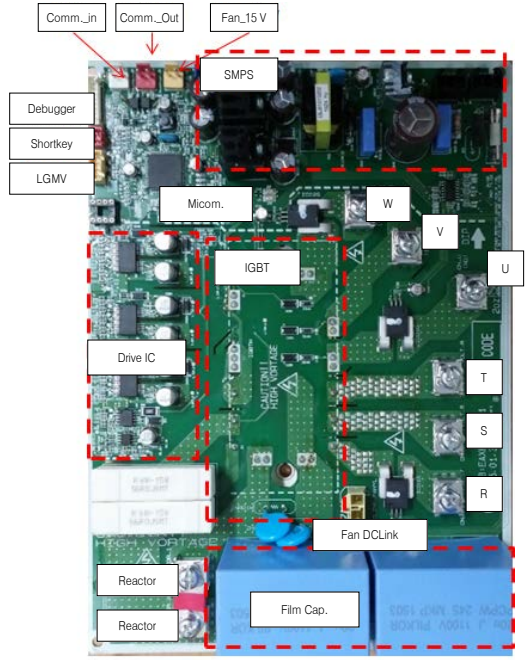
15. Inverter PCB

15.1 Failure Judge Method

1. Error code check

Error Code	Error diagnosis
–	· Checking restart after power reset
CH52, CH57	· Even after checking 220V connection condition for Inverter SMPS power supply
CH52, CH57, CH105	· Even after checking Main – Inverter PCB communication harness(2pin, White) connection condition
CH23, CH50	· Even after checking R, S, T connection harness condition (Open, Wrong connection) and connection sequence.
CH21	· Even after replacing compressor
CH21, CH26	· Even after checking U, V, W connection condition
CH60	· Even after checking EEPROM inserting (direction, pin break, etc.) condition.

2. Inverter PCB check



15.2 Failure Cause

1. High voltage (T-N more than 484V, N phase wiring fault) → CH50
2. Rainwater inflow by Control box / Front Panel / Service port open, Control box screw loosening
3. Part short by foreign substance
4. Defective Fan motor / PCB / Diode / Resistance / Capacitor / Regulator

15.3 Precautions of Replacement

1. Be sure to use the main PCB suitable for the model (Check P/No)
2. Be sure to turn off the power and wear insulated gloves before touching the PCB.
3. Use box or bag only for PCB.
4. Be sure to apply thermal grease.
5. When IGBT screw is fastened, it should be fastened two times.
6. If on-boarding is required after replacement, check the program and EEPROM C/Sum (especially when using an alternate Main PCB)

15.3 Check Point after Replacement

1. Check whether there is any abnormality when the cycle is stabilized at cooling or heating mode.
2. Check current Hz control according to target Hz
3. Over current error check (CH29)
4. Check that compressor 1 and 2 are properly connected.
5. Check that the target high / low pressure is reached.

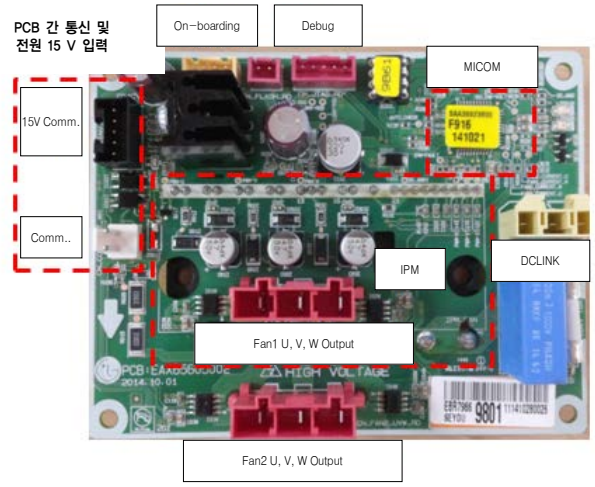
16. Fan PCB

16.1 Failure Judge Method

1. Error code check

Error Code	Error diagnosis
–	· Checking restart after power reset
CH105	· Even after checking 220V connection condition for Inverter SMPS power supply
CH76, CH107	· Even after checking DC_Link P, N connection harness assembly condition (Open, Wrong connection)
CH77, CH106	· Even after replacing fan motor · Even after fan motor connector misconnection(U, W, V output)

2. Inverter PCB check



16.2 Failure Cause

1. High voltage (T–N more than 484V, N phase wiring fault) → CH50
2. Rainwater inflow by Control box / Front Panel / Service port open, Control box screw loosening
3. Part short by foreign substance
4. Defective Fan motor / PCB / Diode / Resistance / Capacitor / Regulator

16.3 Precautions of Replacement

1. Be sure to use the main PCB suitable for the model (Check P/No)
2. Be sure to turn off the power and wear insulated gloves before touching the PCB.
3. Use box or bag only for PCB.
4. Be sure to apply thermal grease.
5. When IGBT screw is fastened, it should be fastened two times.
6. If on–boarding is required after replacement, check the program and EEPROM C/Sum (especially when using an alternate Main PCB)

16.4 Check Point after Replacement

1. Check whether there is any abnormality when the cycle is stabilized at cooling or heating mode.
2. Check current Hz control according to target Hz
3. Over current error check (CH29)
4. Check that fan 1 and 2 are properly connected.
5. Check that the target high / low pressure is reached.

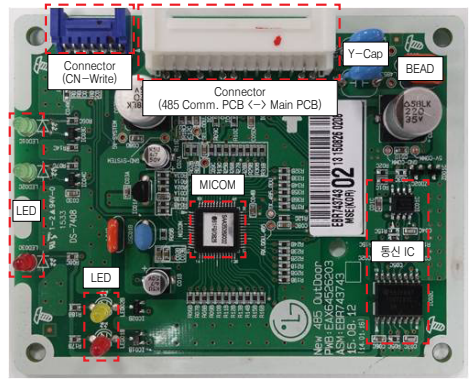
17. Communication PCB

17.1 Failure Judge Method

1. Error code check

Error Code	Error diagnosis
–	· Checking restart after power reset
CH05, CH53	· Even after checking 220V connection condition for main SMPS power supply
CH76, CH107	· Indoor/Outdoor communication PCB connection harness(24pin), Main – External PCB communication harness(10pin) connection condition
CH05, CH53, CH104, CH237, CH238	· Even after checking the connection condition of indoor and outdoor communication lines (shield wire, unshield wire)

2. Communication PCB check



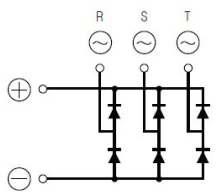
17.2 Failure Causes

1. Part short (by foreign substance, moisture)
2. Resistance / Capacitor / Micom / Comm. IC defect
3. Connector & Housing Pin wrong connection
4. PCB Fault

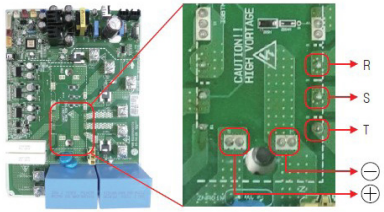
18. Phase Bridge Diode

18.1 Phase Bridge Diode Checking Method

Internal circuit diagram



Appearance



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

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

※ Red(+) and black(–) are the measuring terminals of multi tester.

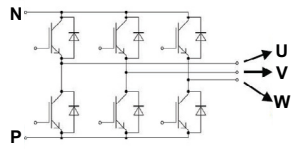
⚠CAUTION

1. 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.
2. There is chance of electric shock by charged voltage.

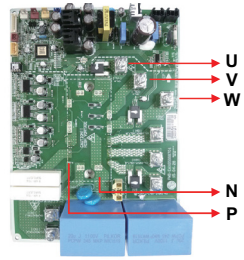
19. Inverter IGBT

19.1 Inverter IGBT Checking Method

Internal circuit diagram



Appearance

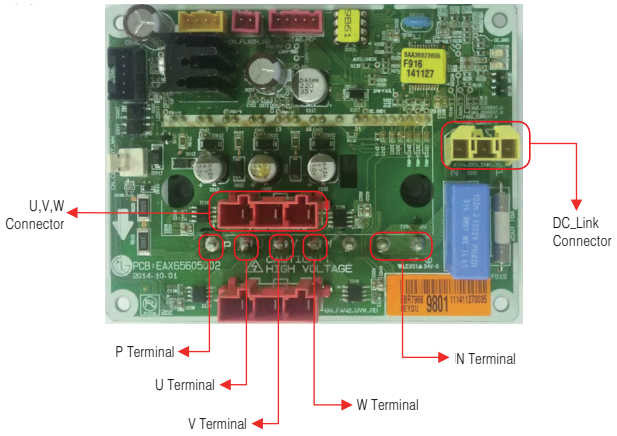


1. Wait until Inverter PCB DC voltage gets discharged, after the main power switch off (approximately 5~10 minutes)
2. Pull out all the connector connected with Inverter PCB
3. Set multi tester in diode mode
4. Measured value should be 0.2~0.6V measuring as below table.
5. In case the measured value is different from the table, set multi tester to resistance mode and measure. If the value is small (0 Ω) or high (hundreds M Ω), PCB needs to be replaced

Diode terminal / Tester terminal	P terminal : black(–)	N terminal : red(–)
U terminal : red(+)	0.2 V ~ 0.6 V	–
V terminal : red(+)	0.2 V ~ 0.6 V	–
W terminal : red(+)	0.2 V ~ 0.6 V	–
	P terminal : red(+)	N terminal : red(+)
U terminal : black(–)	–	0.2 V ~ 0.6 V
V terminal : black(–)	–	0.2 V ~ 0.6 V
W terminal : black(–)	–	0.2 V ~ 0.6 V

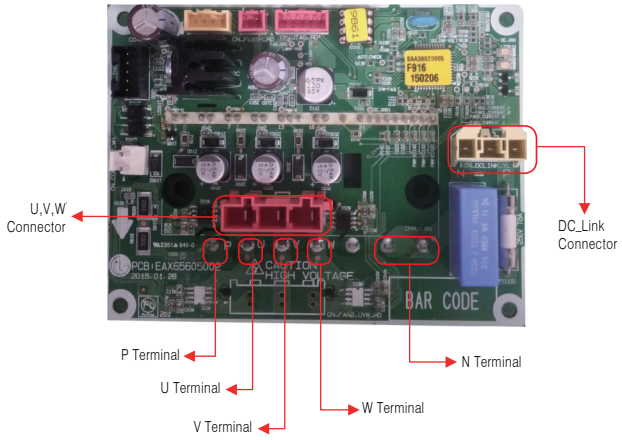
20. Fan IPM

20.1 Fan IPM Checking Method



1. Wait until Fan PCB DC voltage gets discharged after the main power switch off
2. Pull out DC Link connector and U, V, W fan motor connector connected with fan PCB
3. Set multi tester in resistance mode
4. If the value between P and N terminal of IPM is short (0Ω), PCB needs to be replaced (IPM damaged)
5. If the measured value is different from the value given in the table, PCB is needs to be replaced

Diode terminal / Tester terminal	P terminal : black(–)	N terminal : red(–)
U terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
V terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
W terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
	P terminal : red(+)	N terminal : red(+)
U terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)
V terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)
W terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)



1. Wait until Fan PCB DC voltage gets discharged after the main power switch off
2. Pull out DC Link connector and U, V, W fan motor connector connected with fan PCB
3. Set multi tester in resistance mode
4. If the value between P and N terminal of IPM is short (0Ω), PCB needs to be replaced (IPM damaged)
5. If the measured value is different from the value given in the table, PCB is needs to be replaced

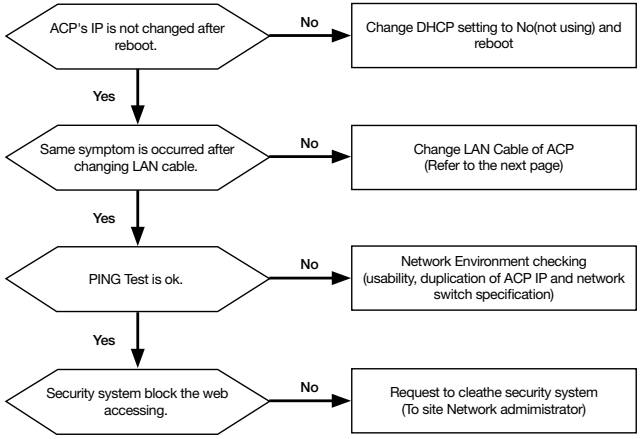
Diode terminal / Tester terminal	P terminal : black(–)	N terminal : red(–)
U terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
V terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
W terminal : red(+)	4.98 MΩ ± 10 % (25℃)	5.85 MΩ ± 10 % (25℃)
	P terminal : red(+)	N terminal : red(+)
U terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)
V terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)
W terminal : black(–)	4.49 MΩ ± 10 % (25℃)	0.72 MΩ ± 10 % (25℃)

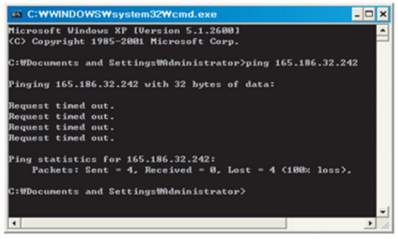
21. Central Controller PC Status

Checking Item	Error diagnosis	Error diagnosis
PC Network Setting	Can not access to ACP from PC	· Check network setting · Check LAN cable · Check status of DHCP setting
PC Software		· ACP version check · Check interface program (JAVA / Flash Player)

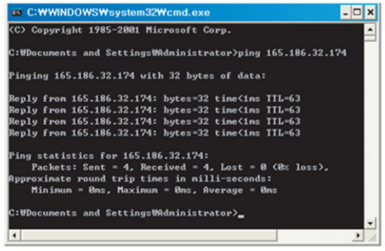
21.1. PC Network Setting

■ Checking Method (Flow Chart)





<Ping Test – Failure>



<Ping Test – Success>

■ Network Environment Checking

Case 1. The ACP directly connect with PC through a cross cable. But, you cannot access the ACP

- Check IP address of the ACP and IP address of the PC.
  Ex) If IP address of the ACP is 192.168.1.101 and Net mask is 255.255.255.0, check if the first three digits of the IP address of the PC is the same as the first three digits of the IP address of the ACP.
  In such case, the IP address of the PC shall start with 192.168.1, and it shall be different from the IP address of the ACP. Set as follows, and try againg.

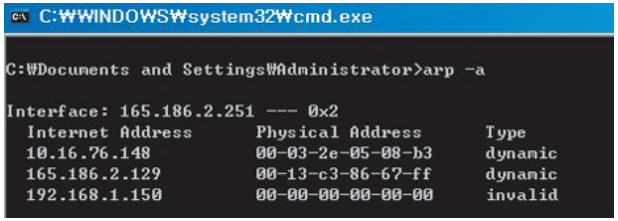
  – Setting of the ACP
  IP address: 192.168.1.112
  Gateway addresss: 192.168.1.1
  Subnet Mask: 255.255.255.0

  – Setting of the PC
  IP address: 192.168.1.113
  Gateway addresss: 192.168.1.1
  Subnet Mask: 255.255.255.0

- Check the status of the Ethernet cable (LAN cable).
- Some PC device can't connect to ACP through "Direct" LAN cable.

Case 2. PC and ACP are connected in a hub or a switch hub. But, you cannot access the ACP

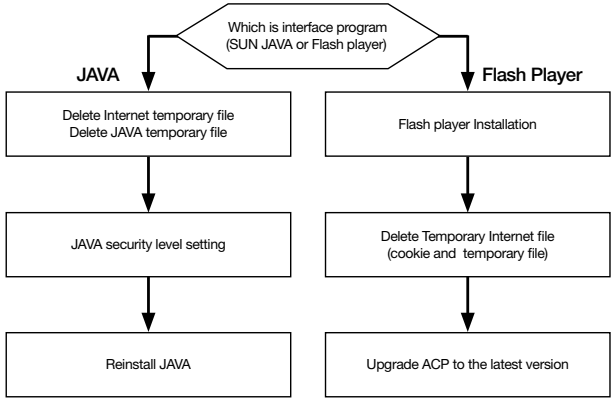
- If it is right after changing the IP setting of the ACP, reset the power of the ACP.
- If it is right after connecting LAN cable to the hub or switch, it may take time for the hub or the switch to recognize the ACP. in such case, it may help to turn off and turn on the power of the hub or the switch.
- Check the status of the Ethernet cable (LAN cable)
- Check ARP table of the PC to see if the IP address of the ACP correnctly corresponds to the MAC address. If duplicate MAC addresses correspond to one IP address, or if different address from the MAC address of the PC is output, there may be a host with the same IP address as the IP address of the ACP. in such case, the IP address of ACP or the IP address of the corres ponding host shall be changed.



How to check ARP table

21.2. PC Software

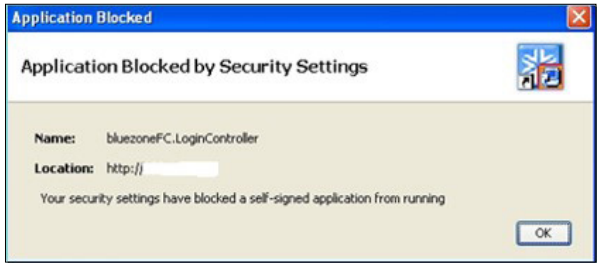
■ Checking Method (Flow Chart)



■ JAVA Security Level Setting

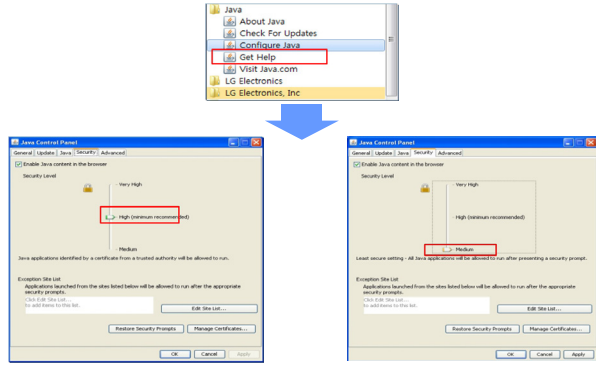
1. Symptom

A phenomenon pop up following message and not run the program during opening Vnet program as access web page of ACP

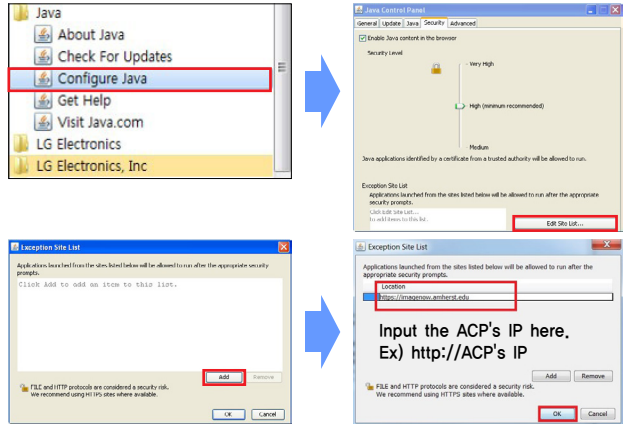


2. Countermeasure

2.1 If you using JAVA7, you can solve the problem through how to set the security level to "medium" on the [security] tab.
[Start Menu –〉 All Programs –〉 JAVA Click –〉 Configure Java–click]
But if you ever become a concern about security, we recommend that ACP's IP add to exceptions listed sites.



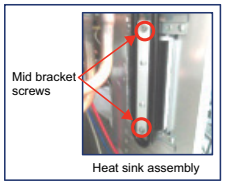
2.2 If the ACP's IP changed, add the ACP's IP to exceptions sites again



■ Control box / Inverter PCB Servicing / Dismantling Procedure.

WARNING

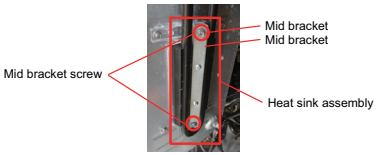
- Do not pull out the heat sink assembly before removing the middle bracket screws.
- Do not apply heavy force on tube parts while detaching the heat sink assembly.
  It may damage and leads to failure of device. Gently detach total heat sink assembly.



■ Control Box assembly Servicing / Dismantling Procedure

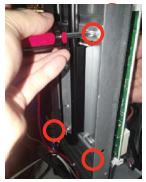
1. Remove the control box cover.
2. Remove the middle bracket screws as shown in the figure.
3. Gently detach the Heat sink assembly from the control box
4. Detach Fan lead wire from the control box and compressor lead wires from the compressors.
5. Now the control box assembly can be removed from the outdoor unit after removing the outer screws.
6. Inversely follow above procedure (1~5) to reassemble the control box.

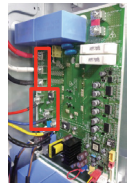
Note.
Apply thermal grease at the heat sink if necessary.



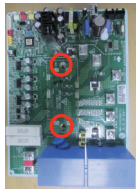
■ Inverter PCB Servicing / Dismantling Procedure

1. Remove the Thermal Pad mounting screws at the left side of the control box (4EA)
2. Carefully pull out the Inverter PCB from control box assembly.
3. Detach the Compressor (U/V/W) and the power input (R/S/T) lead wires.





4. Unscrew the middle IGBT mounting screws (2EA)
5. Finally take out the PCB from the corner supporters.
6. Follow the same procedure (1~5) inversely to reassembly the inverter PCB.



Note.
1. Apply thermal grease at heat sink if needed.
2. Carefully reconnect the wires with out interchanging the locations.

MULTI V 5

Ⅳ. Function Control

1. Generation 4 Features

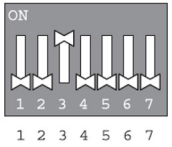
Generation 4 Features (Gen. 4)

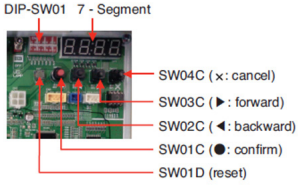
- Two (2) set point control between zone and central / gateway controllers.
- Improved cooling / heating thermal on / off range setting.
- Improved communication rate / auto addressing time.
- Fan off during cooling thermal off setting.
- New Premium controller / upgraded programmable controller.
- Improved group control airflow features.
- Indoor unit power consumption display.
- Added heating test mode / commissioning operation setting.
- Filter status notification.
- System product check feature using wall controller.

The latest versions of LG' s indoor units are Generation 4 (Gen 4).
For Gen 4 indoor units to operate with Gen 4 indoor unit features, the air conditioning system must meet the following requirements:

- All indoor units, heat recovery units, and outdoor units must be Gen 4 or higher.
- All Outdoor units must have Gen 4 or higher software installed.
- Outdoor units DIP switch 3 must be set to ON (factory default setting is OFF).
- All controllers must support Gen 4 indoor unit features.

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



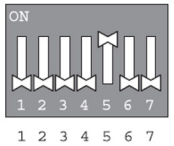


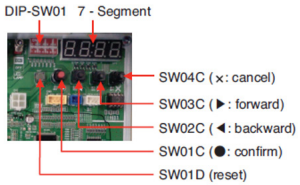
Outdoor Units*	Indoor Units**	Heat recovery boxes	Outdoor Unit Dipswitch No.3	Operation Status
Gen 4 or Higher	Gen 4 ONLY	Model 2A ONLY	Must be ON	System will operate with Gen. 4 indoor unit features.
			OFF	System will operate but without Gen. 4 indoor unit features.
		Any combination of Models 1A, 2A	Must be OFF (factory default)	Does NOT include Gen. 4 features. System will not operate if DIP Switch No. 3 is ON, and an error code CH200 will be generated to ODU and CH242 on Gen 2 IDU.
	Any com-bination of Gen 2 and Gen 4	Model 2A ONLY	Must be OFF (factory default)	
		Any combination of Models 1A, 2A		
		Any combination of Models 0A****1A, 2A	N/A***	Does not include Gen. 4 features.

* Gen 4 or Higher outdoor units
: Multi V 5, Multi V IV or Multi V Water IV with Gen 4 or Higher software (see table below for Gen 4 or higher serial numbers) or Multi V S.
** Gen 4 Indoor Units model numbers end in "4" ; Gen 2 Indoor Units model numbers end in "2" or an "A" , including Hydro Kit.
*** DIP Switch No. 3 on Gen 2 outdoor units is not related to Gen 4 features as it is with Gen 4 outdoor units.
**** 0A Model Heat Recovery boxes are not for use with Multi V 5, Multi V IV, Multi V Water IV, or Multi V III heat recovery systems.

2. Function Control Setting

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





■ The Function Table

FD - Function codes designated as "FDD" are used by the Multi V commissioning agent to assist with system startup. No "FD" function code should be left in the "on" position without an authorized LG commissioning agent approving the use.

FN - Function codes designated by "Installation" are used to modify the behavior of one or more com-ponents of the VRF system. A change in the value of an "FN" function code typically impacts the behavior of the refrigeration system control universally.

SE - Function codes designated as "Service" should only be used by a qualified Multi V VRF Service Engineer. The "SE" codes are designed to provide the qualified service technician with manual control of the VRF system component(s) as an aide in isolating an operational problem during initial commissioning and startup or to assist the service technician with diagnosing an opera-tional problem. No "SE" function code should be left in the "on" position without a qualified Multi V service technician on site.

ID - Function codes designated by "IDU" are used to modify the behavior of one or more of the indoor units. A modification to an ID function code value typically is used to fix a localized issue with a single or group of indoor units.

Mode	Display	Function Selection Content	Model Type		Page
			Heat Recovery	Heat Pump	
Fdd	Fd 1	Automatic Refrigerant Charging (Cooling)	●	●	202
	Fd 2	Automatic Refrigerant Charging (Heating)	●	●	202
	Fd 3	Refrigerant Amount Check (Cooling)	●	●	-
	Fd 4	Refrigerant Amount Check (Heating)	●	●	-
	Fd 7	Automatic ITR (Cooling / Heating)	●	●	205
	Fd 8	All IDU operation (Cooling)	●	●	209
	Fd 9	All IDU operation (Heating)	●	●	209

Mode	Display	Function Selection Content	Model Type		Page
			Heat Recovery	Heat Pump	
Func	FN 1	Cool & Heat Selector	-	●	210
	FN 2	High Static Pressure Compensation	●	●	212
	FN 3	Night Low Noise	●	●	214
	FN 4	Overall Defrost	●	●	216
	FN 5	ODU Addressing	●	●	218
	FN 6	Snow Removal & Rapid Defrost	●	●	219
	FN 7	Airflow Adjusting for IDU	●	●	220
	FN 8	Target Pressure Adjusting	●	●	221
	FN 9	Low Ambient Kit	●	●	222
	FN 10	High Efficiency Mode (Cooling Operation)	●	●	223
	FN 11	Auto Dust Removal Mode	●	●	224
	FN 12	Compressor Max. Frequency Limit	●	●	225
	FN 13	ODU Fan Max. RPM Limit	●	●	226
	FN 14	Smart Load Control	●	●	227
	FN 16	Humidity Reference	●	●	231
	FN 17	Active Oil Control	●	●	-
	FN 19	The Connecting of Central Control at IDU Terminals	●	●	232
	FN 20	Compressor Input Current	●	●	233
	FN 21	The Smart Plug	●	●	234
	FN 22	Overall Defrost Entrance for Low tem-perature	●	●	235
	FN 23	Optional Base Panel Heater	●	●	236
SVC	SE 1	Pump Down	●	●	237
	SE 2	Pump Out	●	●	239
	SE 3	Vaccum	●	●	243
	SE 4	Back Up	●	●	244
	SE 5	Forced Oil Return	●	●	246
	SE 6	Forced Defrost	●	●	246
	SE 8	Display Cycle Information	●	●	247
	SE 9	Noise Reduction	●	●	248
	SE 10	Entry Heating Oil Return	●	●	249
	SE 11	Heating Fan Low Noise	●	●	250
	SE 12	Number of Partial Defrost	●	●	251
	SE 14	Level Changes of CH200	●	X	252
	SE 15	Level Changes of CH53	●	●	252

Mode	Display	Function Selection Content	Model Type		Page
			Heat Recovery	Heat Pump	
Idu	Id 1	EEV Pulse of Non-Operating IDU in Heating	●	●	253
	Id 2	Set IDU Superheat	●	●	254
	Id 3	Set IDU Subcool	●	●	254
	Id 5	Set Auto Pipe Detection	●	-	255
	Id 6	Start Auto Pipe Detection	●	-	255
	Id 7	Set Zone Master	●	-	257
	Id 8	Operating IDU Low Noise	●	-	258
	Id 9	In Cooling IDU EEV Max. Pulse	●	●	259
	Id 10	Comfort Cooling	●	●	260
	Id 11	Non-Operating IDU Subcool	●	●	262
	Id 12	Set IDU Superheat for Fan	●	●	263
	Id 13	IDU Fan RPM Direct Control	●	●	-

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

3. FDD Mode

3.1 FDD Check List

■ Please check the following.

1. Automatic address setting has been preceded by a test drive will proceed on the premise.
   After installation, auto address must be checked because it is related the number of Installation

2. 3 minutes after the initial power on test drive at one point.
   After the power on, MICOM data reset and communication with indoor unit time is 3minute

3. Indoor units must be manufactured after Feb. 2009.

4. In FDD test drive, state of the test drive and error are displayed using 7 segment.
   The process of the test drive and state of error are displayed using only the master outdoor unit.

5. If the error is occurred during the test drive, it will be operated the last step after turn off the test drive. After the dipswitch off, pressing the black button for 2 seconds in order to reset all data and return to operation standby state

6. SW04C (X: Cancel) button and SW01C (●: execute) button is pressed for more than 5 seconds at the same time when the test drive must be turned of the reason of abrupt trouble during test drive.

7. All indoor units are turned off or the results are displayed after 90 seconds when the test drive is over.

8. First, please pressing the main PCB reset button for 3 minutes when you want to use all FDD func–tions.

9. Normal test run is operated when you use more than LGMV 7.1.1 version.

⚠CAUTION
- If the product is used for the first time after installation, the ITR (Fd7) must be completed before normal use.
- The indoor unit can not be operated during FDD operation (indicated by 'HL' on the wired remote control).
- When replacing the main PCB, please use it as the old EEPROM. (Test run information is stored in EEPROM)

3.2 FDD Code Display

Code	Display	Cause
E01	E01	130% more than outdoor unit rated capacity or 80% less than outdoor unit rated capacity
E02	E02	System Unstable Error
E03	E03	Temperature Range Error
E04	E04	Can't operate FDD function to be frost
E05	E05	In case error occurs during sensor checking process
E06	E06	Occurs when the indoor unit number is one
E07	E07	If not click the button in auto charging function
E08	E08	FDD feature forced termination or Refrigerant auto charging normal termination
E09	E09	Wait a system-off for operate FDD function
E10	E10	Need additional refrigerant sealed
Itr / Inlt	Itr Inlt	No FDD test run
PrEs / Butn	PrES bUtn	When it is judged that refrigerant sealing is necessary during auto charging function
System error		Occur system error

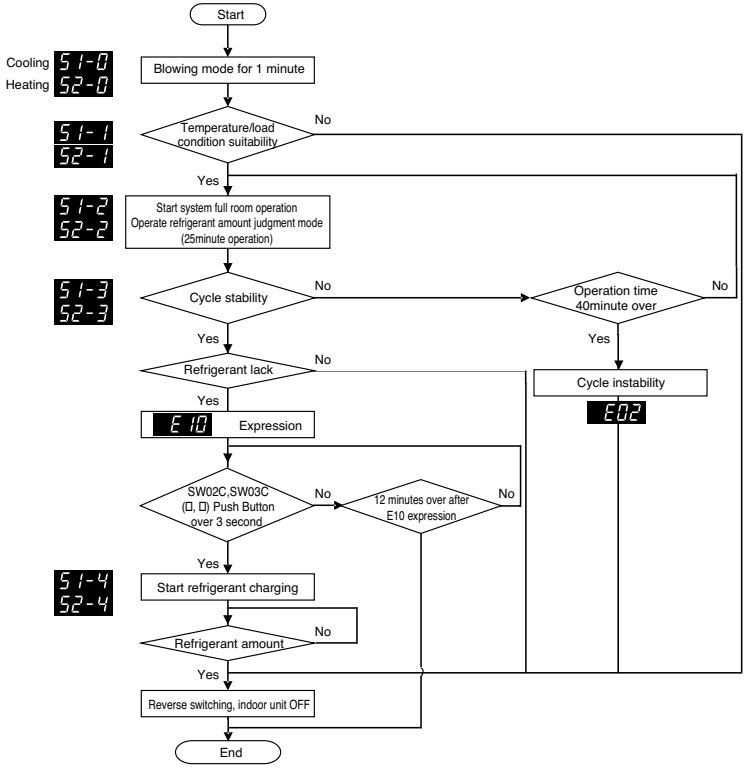
3.3 Refrigerant Auto Charging (Cooling / Heating)

This function charge suitable refrigerant amount in system through cycle operation automatically. If the refrigerant amount is inaccurate by service, pipe leakage, etc, can use this function.

■ Setting the function

Function	
Refrigerant Auto Charging	Fd 1 (Cooling) / Fd 2 (Heating)

■ Flow Chart



■ Detailed information

- Install refrigerant charging device like this page.

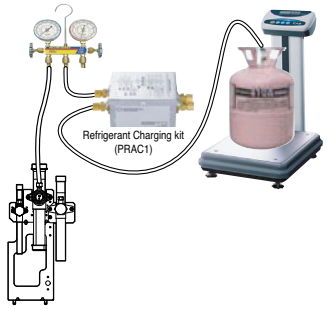
- If it is out of the guarantee temperature range, can end by not operating refrigerant charging.
  - Outdoor guarantee temperature range
    cooling : 0~43℃ [32~109.4 ℉] / heating : -10~24℃ [14~75.2℉]
  - Indoor guarantee temperature range
    cooling : 0~32℃ [32~64.4℉] / heating : 10~27℃ [50~80.6℉]

- If the system are turned off continuously by low pressure decrease excessively due to refrigerant lack before E10 expression, try again after add about 15% refrigerant of regular refrigerant amount.

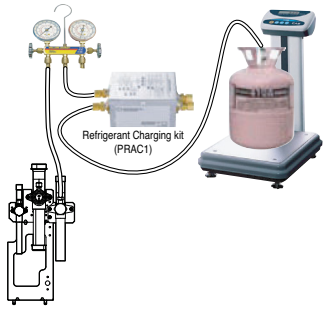
- Press SW04C(X: Cancel) button and down dip switch after function end.

■ Refrigerant Charging Method

Heat recovery system



Heat pump system



- Procedure

1. Prepare Manifold, refrigerant and scale. (sold separately)
2. Connect Manifold to refrigerant charging port As shown in the figure above.
3. Connect Manifold and refrigerant.
4. Perform the air purge between Manifold hose.
5. When PrES / PUtn is appeared, push '▶' or '◀' button.
6. When S1-4 or S2-4 is appeared, open the valve and fill the system with the refrigerant.
7. When S1-5 or S2-5 is appeared, close the valve and remove connected charging port.

⚠WARNING

- When perform the leakage test and air purge, please use a vacuum pump or an inert gas. (nitrogen)
- If you use Oxygen, compressed air and flammable gas, there are fire and danger of explosion. There are risk of death, personal injury, fire, explosion.

⚠CAUTION

- When you put refrigerant, using the specified equipment.
- Please the wired remote control to set the main unit.
- During Indoor unit operating, be careful not to be thermo off.
- Use refrigerant charging, if service only.
- Put the refrigerant by calculating the refrigerant amount surely, if install.
- Refrigerant charging time can be different following the charging refrigerant amount. (charging time : about 3 kg / min)
- If The outdoor unit occurred frost when Heating automatic refrigerant filling, Please restart corresponding function after forced defrost.

3.4 Automatic ITR (Cooling / Heating)

It is a function to get information about amount of refrigerant and EEV status in IDU, ODU if normal or not.

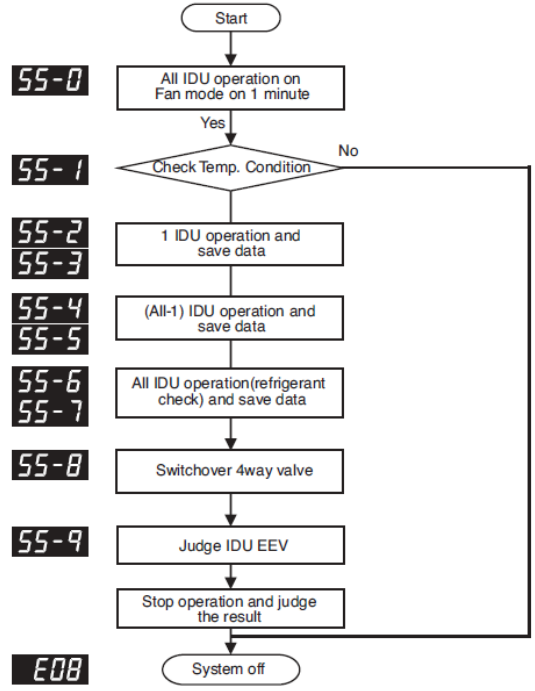
■ Setting the function

Function	
Automatic ITR (Cooling / Heating)	Fd 7

■ Flow Chart

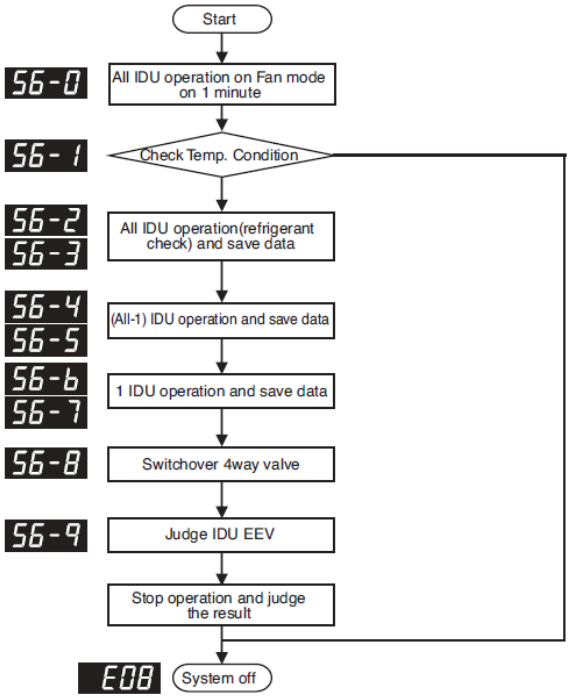
1. Cooling

- If the system is in operation before entering the cooling test operation, "IDU / STOP" is displayed, then the indoor unit is turned off and the FDD operation is entered. please enter the total amount of refrigerant accurately before entering mode.



2. Heating

- If the system is in operation before entering the heating test operation, "IDU / STOP" is displayed, then the indoor unit is turned off and the FDD operation is entered, please enter the total amount of refrigerant accurately before entering mode.



■ The Display of Results

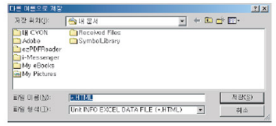
		Judgment	Code	Display
ITR(Cooling)	IDU EEV	OK	5-Cn	5-cn
		NG	5-C1	5-c1
		Impossible to Judge	5-CF	5-cF
	Refrigerant	More than standard	ex) 20%	20
		Less than standard	ex) -15%	-15
		Don't Adjustment required	00	00
		Impossible to Judge	3-CF	3-cF
ITR(Heating)	IDU EEV	OK	6-Cn	6-cn
		NG	6-C1	6-c1
		Impossible to Judge	6-CF	6-cF
	Outdoor Main EEV	OK	7-Cn	7-cn
		NG	7-C1	7-c1
		Impossible to Judge	7-CF	7-cF
	Refrigerant	More than standard	ex) 20%	20
		Less than standard	ex) -15%	-15
		Don't Adjustment required	00	00
		Impossible to Judge	3-CF	4-cF

⚠CAUTION

- Ask an authorized technician to setting a function.
- Guaranteed temperature range.
  - IDU : 18~32℃ [64.4~89.6℉] / ODU : 0~43℃ [32~109.4℉]
- In case the function is not used, set the dip S/W oFF and reset the power.
- If the indoor unit error occurs, indoor unit operate in fan mode, the indoor unit number that occurred an error is not displayed.
- Fd3 and Fd4 (refrigerant amount check) is function to judge the system's refrigerant automatically through the system operation. For details, refer to the service manual.

■ ITR Result Report

1. Start LGMV and choose the menu for test run report.



2. Save the html file

3. Open the saved html file through explorer, etc.

Installation Information

	이름	회사명 / 주소	제품구성	
설치			실외기	1 대
CIQ			실내기	4 대
관리			분배기	0 대
서비스			충냉매량	10.3 Kg

*제품 구성정보가 실제 설치와 일치하는지 확인 바랍니다.

Test Condition

	공기온도	기준제	시운전상태	
실내	26.9 °C	냉방: 10°C ≤ 실내온도 ≤ 35°C 난방: 15°C ≤ 실내온도 ≤ 35°C	운전모드	냉방 시운전
실외	25.1 °C	냉방: 0°C ≤ 실외온도 ≤ 45°C 난방: -10°C ≤ 실외온도 ≤ 35°C	시운전에러정보	정상 종료

Test Result

냉매량	실외기 EEV	실내기 EEV
정상 냉매량 : 10.2kg	-	정상

*위 검사 항목 중 하나라도 정상이 아닌경우, 다른 항목들의 검사에도 영향을 받을 수 있습니다. 문제되는 항목 수정 후 재검사바랍니다.

Cycle Summary

항목	실외기1				실외기2				실외기3				실외기4				판단기준
	최소	최대	평균	합부	최소	최대	평균	합부	최소	최대	평균	합부	최소	최대	평균	합부	
고압 (kPa)	2112	2643	3372		0	0	0		0	0	0		0	0	0		2000~3500kPa (Cool/Heat)
저압 (kPa)	677	726	1124		0	0	0		0	0	0		0	0	0		650~1200kPa(Cool) 200~1000kPa(Heat)
메인 EEV 개도	30	65	130		0	0	0		0	0	0		0	0	0		-
토출센서 (°C)	-	-	22		-	-	0		-	-	0		-	-	0		10 ~ 50°C
흡입센서 (°C)	-	-	13.8		-	-	0		-	-	0		-	-	0		0.5 ~ 30°C
외기온 (°C)	-	-	19.2		-	-	0		-	-	0		-	-	0		

3.5 All IDU operation (Cooling / Heating)

It is a function to continuously operate in cooling / heating for one hour.

■ Setting the function

Function	
All IDU operation (Cooling)	Fd 8
All IDU operation (Heating)	Fd 9

■ Detailed information

- This function is used with heat pump and heat recovery.
- It is used for the purpose of checking the drain or heating cycle (EEV etc. parts inspection) when cooling / heating continuous operation is not possible due to themo off.

⚠CAUTION
- Ask an authorized technician to setting a function.
- This function enables additional charging of the refrigerant and installation inspection before ITR.

4. Function Mode

4.1 Cool & Heat selector

It is a function to control the cooling / heating limit through the switch of cool & heat selector and ODU
This is used to prevent heterogeneous operation and unnecessary energy wastage.

■ Setting the function

Function		Option
Cool & Heat selector	Fn 1	oFF, op1~op2

■ Option Selection

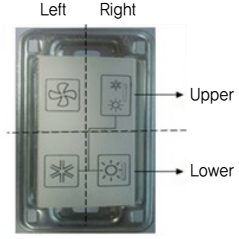
Switch Control		Function		
Switch (Up)	Switch (Down)	oFF	op1	op2
Right side (On)	Left side (Left)	Not operate	Cooling	Cooling
Right side (On)	Right side (On)	Not operate	Heating	Heating
Left side (On)	–	Not operate	Fan mode	Off

• If "On" & "op1" is selected, the following three operating scenarios are possible:

1) Cooling mode
The right side of the upper switch + The right side of the lower switch.

2) Heating mode
The right side of the upper switch + The left side of the lower switch.

2) Fan mode
The left side of the upper switch (The position of the lower switch is irrelevant)
Mechanical refrigeration is locked out and the IDU fans are allowed to operate.



■ Detailed information

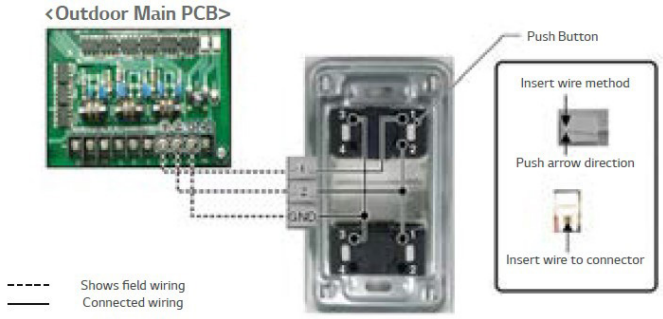
• This function is used with heat pump only.

• Heating, Cooling, Fan Only, Dry modes are a change in the setting impact.

• Cool & Heat selector information

- IDU control without central controller.
- Select operation mode : Cooling, Heating, Fan mode.
- Mode lock for cooling & heating mixing error-proof during the change of season.
- The Cool & Heat selector switch consists of two toggle switches mounted over/under. The upper switch is two-position and manually locks out heating and cooling operation allowing Fan only or allows heating or cooling operation depending on the position of the lower switch. The bottom switch is two-position and manually sets the position of the outdoor unit's reversing valve. If the left side is depressed, the valve is in the cool position. If the right side is depressed, the valve is in the heat position.

• Wiring Diagram



⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- If use a function, first install a Cool & Heat selector.
- Simultaneous model can not be used.
- Communication line length can be maximum 300m, use Communication line as thick as 1.25mm.
- This function is disabled during central controller connection.
(Central control mode lock function is prior to this function)

4.2 High Static Pressure Compensation

This function secures the air flow rate of ODU, in case the static pressure has been applied like using duct at fan discharge of ODU.
When the static pressure is added to the air flow rate of ODU, the air flow rate is reduced. This function compensates the reduced air flow rate by increasing the RPM of fan according to the static pressure.

■ Setting the function

Function		Option
High Static Pressure Compensation	Fn 2	oFF, op1~op7

■ Option Selection

Setting	UXA (8~12HP)			
	RPM	Pa	CMM at 0Pa	CMM at 80Pa
Standard (Default)	880	0~20	240	175
op1	910	21~40	255	190
op2	930	41~60	265	200
op3	950	61~80	270	205

Setting	UXB (14~26HP)			
	RPM	Pa	CMM at 0Pa	CMM at 80Pa
Standard (Default)	1000	0~20	320	190
op1	1040	21~40	335	230
op2	1070	41~60	350	260
op3	1100	61~80	360	280

※ Based on connecting duct

■ Detailed information

- This function is used with heat pump and heat recovery.
- All modes of operation involving compressor operation are a change in the setting impact.
- The operating symptoms that might be corrected using this function During normal operation in cooling mode, the system head pressure is consistently high relative to target pressure. In heating mode during normal operation, the system suction pressure is too low relative to the target pressure.
- If the air flow rate of ODU is decrease according to the static pressure, the efficiency of the system decreases. generally, when the air flow is less than 80% of the rated air flow, the cycle changes abnormally. (ex. high pressure over-pressure, low pressure over-pressure)
- Each option increases the max RPM to ensure air flow rate at least 80% of the rated air flow rate, depending on the static pressure.

⚠CAUTION
- Ask an authorized technician to setting a function.
- If the indoor unit combination is more than 100%, a higher level option setting should be considered.
- The air flow increases when the option is set at a higher level than the static pressure. This causes increase in noise and power consumption.
- It is recommended to check the correct static pressure when setting the option step.

4.3 Night Low Noise

The night low noise function is used to reduce the operating speed of the outdoor unit fans under normal operating conditions in the evening while the outdoor unit is operating in the cooling mode.

■ Setting the function

Function		Option
Night Low Noise	Fn 3	oFF, op1~op12

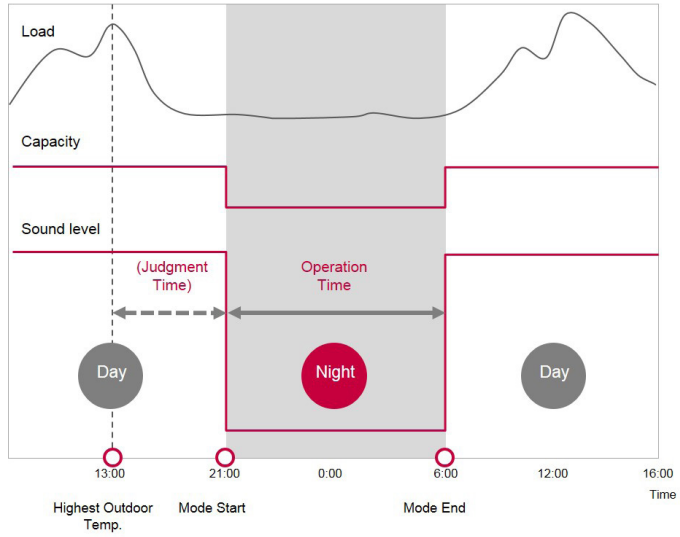
■ Option Selection

Setting	Judgment Time (Hr)	Operation Time (Hr)	Noise	
			UXA	UXB
op1	8	9	55	59
op2	6.5	10.5	55	59
op3	5	12	55	59
op4	8	9	52	56
op5	6.5	10.5	52	56
op6	5	12	52	56
op7	8	9	49	53
op8	6.5	10	49	53
op9	5	12	49	53
op10	Continuous Operation		55	59
op11	Continuous Operation		52	56
op12	Continuous Operation		49	53

- Judgment Time : The time that the outdoor temperature is highest – Function starts time
- Operation time : The time that the low noise operation function is maintained after the function is turned on
- Option : Determine the target noise level (limited Max FAN RPM by option step)

■ Detailed information

- This function is used with heat pump and heat recovery.
- Cooling mode is a change in the setting impact.
- Multi V 5 continuously monitors the building's cooling demand. On a rolling 24 hour basis, the peak cooling demand is maintained and an internal timer begins counting hours since the peak demand was set. Depending on which setting value is selected, Multi V 5's Night Low Noise function will delay the beginning time of the restricted fan speed operation. Also, depending on which setting value is selected, the restricted fan speed period time varies.
- Night Silent Operation



⚠CAUTION
- Ask an authorized technician to setting a function.
- In case of setting the target noise level, cooling capacity can be decreased.
- In most applications, since the cooling load decreases during the night, setting this function has no detrimental impact on cooling capacity.
- You can set the low noise mode control main agent by using wired remote controller (for details, refer to the new standard remote controller's manual.

4.4 Overall Defrost

It is a function to select the overall or partial defrost when the defrost is in operation.

■ Setting the function

Function		Option
Overall Defrost	Fn 4	on, oFF

■ Option Selection

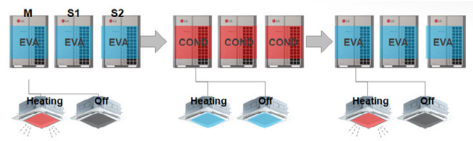
Setting	Detail of function
on	Overall defrost
oFF	Partial defrost (Default)

- Overall Defrost – Return to heating after quick defrosting operation
- Partial Defrost – Operate defrosting while heating

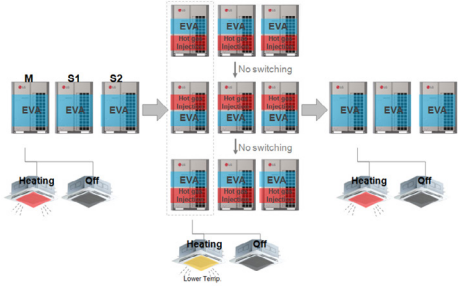
■ Detailed information

- In locations where the relative humidity remains high during the heating season or where experience has shown that defrosting all the outdoor units at the same time saves energy and/or shortens the time it takes to defrost the outdoor unit coil without impacting the comfort level in the building.
- This function is used with heat pump and heat recovery.
- Heating mode is a change in the setting impact.
- The operating symptoms that might be corrected using this function When the outside ambient air temperature is above 0℃(32℉), visual inspection shows that all frost (or ice) is not cleared from the outdoor unit's coil following a defrost cycle.
- Overall defrost mode recommended environment When the temperature of continuous heating is kept for a long time in a low temperature and high humidity environment in winter.
  (outdoor temperature : –5℃ or less / humidity : 70% or more)

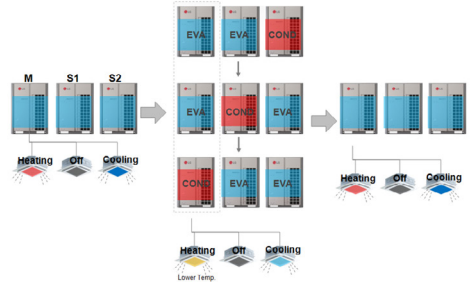
- Schematic Diagram
  1) Overall Defrost



  2) Partial Defrost (Heat Pump)



  3) Partial Defrost (Heat Recovery)



⚠CAUTION
- Ask an authorized technician to setting a function.
- Although the discharge temperature is lowered, the heating operation rate increases while partial defrost.
- If you use continuous heating mode, please select partial defrost mode.

4.5 ODU Addressing

It is the outdoor unit address setting function for outdoor unit when central controller is installed.

■ Setting the function

Function		Option
ODU Addressing	Fn 5	0 ~ 254

■ Option Selection

Setting	Detail of function
0	Default (Not Install a central controller)
1 ~ 254	Number of outdoor unit

■ Detailed information

- This function is used with heat pump and heat recovery.

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

4.6 Snow Removal & Rapid Defrost

It is a function to prevent accumulation of snow in the snowy area or to judgment the fast defrost in the humid area.

■ Setting the function

Function		Option
Snow Removal & Rapid Defrost	Fn 6	oFF, op1~op3

■ Option Selection

Setting	Mode	Fan speed during snow removal (RPM)	
		UXA	UXB
oFF	Not setting	-	-
op1	Snow removal	670	850
op2	Rapid defrost	-	-
op3	Snow removal & Rapid defrost	670	850

■ Detailed information

1. Snow Removal
- A function to prevent the snow from accumulating and blocking the flow path during the outdoor unit non-operation.
  (set in areas of the country where snow may accumulates on the top of the unit)
- Outside temperature 3 degrees or less, 2 minutes every 30 minutes outdoor fan operation while non-operation.

2. Rapid Defrost
- This is optional logic that limits the severity of frost accumulation on the outdoor unit coil between defrost cycles, it calls for more frequent defrost cycles.
- Rapid defrost start condition.

Conditions		
Tout < 0℃	⊿Tt > 9℃	Tt < -15&&operating time > 90min
0℃ < Tout < -15℃	⊿Tt > 10℃	T indoor, pipe in(avg) < 40℃
Tout ≤ -15℃	-	operating time > 120min
Tout < 5℃	RH > 85%	operating time > 180min

* ⊿Tt : Outdoor Temp. – Heat Exchanger Temp.

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

4.7 Airflow Adjusting for IDU

It is the function to cope with the overload by changing air flow in the room to the low air flow when the compressor Hz is the maximum but the high pressure is low.

■ Setting the function

Function		Option
Airflow Adjusting for IDU	Fn 7	on, oFF

■ Option Selection

Setting	Detail of function
on	Low capacity mode (discharge temperature up)
oFF	Not setting

■ Detailed information

- Use when it is known the outdoor unit is operating at full capacity during the heating season and the indoor unit air temperature in all zones is low, or feels drafty in nearly all the conditioned spaces served by the system.
- This function is used with heat pump and heat recovery.
- Heating modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  This function should only be used on a temporary basis. It is typically used when the outdoor unit is undersized. Symptoms occur most often when the design combination ratio (i.e. [nominal cooling capacity of all IDUs] / [nominal cooling capacity of the outdoor unit]x100) is greater than 130%.

  Symptoms include one or more of the following:
  1) One or more IDU fans will not start because the temperature of the indoor unit coil does not reach 85°F (i.e. perpetual "hot start" mode)
  2) Indoor unit fans run, but the leaving are temperature is low.

⚠CAUTION
- Ask an authorized technician to setting a function.
- Always verify the refrigerant charge is correct before considering the use of this function. This function is not a fix for a poorly designed piping system or a system that is not properly operating.

4.8 Target Pressure Adjusting

It is a function to change the target pressure of ODU according to field installation conditions (ex. pressure loss according to piping length) and customer characteristics (ex. cooling or heating capability).

■ Setting the function

Function		Option
Target Pressure Adjusting	Fn 8	oFF, op1~op6

■ Option Selection

Setting	Cooling (Low Pressure, kPa)	Heating (High Pressure, kPa)
op1	804	2990
op2	725	3121
op3	765	3056
op4	869	2827
op5	935	2663
op6	1000	2500
op7	1065	2337

■ Detailed information

- This function is used with heat pump and heat recovery.
- Heating, Cooling and Dry modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  Low compressor operating speed on peak design days (or low compressor operating hours) during the heating or cooling seasons or both (in the case of an oversized outdoor unit).

⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- Option values of UXA / UXB Chassis are the same.
- A power consumption or capacity can be changed.
- This function can not be set with the remote control.

4.9 Low Ambient Kit

It is a function to Informs the Multi V microprocessor controller the low ambient kit is installed.

■ Setting the function

Function		Option
Low Ambient Kit	Fn 9	on, oFF

■ Option Selection

Setting	Detail of function
on	Low ambient kit installation
oFF	Not setting (Default)

■ Detailed information

- This function is used with heat pump and heat recovery.
  (However, the kit does not extend the range of cooling below −15℃(5 0F) unless all indoor units are operating in cooling when heat recovery is used)
- Low ambient cooling modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  This option assist the Multi V core logic maintain compressor suction pressure at low ambient temperatures.
- In buildings where the zones served by the Multi V system will all need cooling when outdoor ambient temperatures fall below 5℉.
- Operation range after installation of low ambient kit
  Before : −15~48℃ / After : −25~48℃ (detailed refer to the manual)

⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- If low ambient kit is installed, this function must be enabled.
- Refer to the accessory manual or PDB for how to set up and use the guide.

4.10 High Efficiency Mode

High efficiency mode refers to increasing the compressor capability to cool at high ambient temperatures. This function automatically lowers the target low pressure as the outdoor ambient temperature rises while the outdoor unit operates in cooling mode (i.e. reversing valve in cooling position).

■ Setting the function

Function		Option
High Efficiency Mode	Fn 10	on, oFF

■ Option Selection

Setting	Detail of function
on	High efficiency mode
oFF	Default

■ Detailed information

- This function is used with heat pump and heat recovery.
- Cooling and Dry modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  On extremely hot days when cooling demand is the highest, depending on the capacity of the outdoor unit relative to the actual load, if the VRF system is struggling to keep the space temperature, invoking this option may be the solution to provide a little more capacity to meet the need.
- High efficiency mode can be used for all cooling dominant installations. Using this option will provide additional cooling capacity, but will do so by increasing the amount of work (i.e. raises lift) the compressor will perform. Net energy consumed may increase if this option is invoked.

⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- Always verify the refrigerant charge is correct before using this function. If the refrigerant charge is low, the use of this function will not provide any benefit.

4.11 Auto Dust Removal Mode

This function is able to improve the heat exchange efficiency to maintain clean state on heat exchanger of ODU. Dust is removed on heat exchanger of outdoor unit by reverse rotation of fan.

■ Setting the function

Function		Option
Auto Dust Removal Mode	Fn 11	oFF, op1~op5

■ Option Selection

Setting	Reverse cycle fan runtime (min)	Time delay between cycles	Number of cycles
oFF	-	-	-
op1	5	2 hours	No limit
op2	5	2 hours	2
op3	3	5 minutes (following compressor shutdown)	1
op4	1	-	1
op5	1	1	2

■ Detailed information

- This function is used with heat pump and heat recovery.
- Cooling and Dry modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  When the outdoor unit is installed in arid climates, where moisture levels are very low, this option can be selected to assist with keeping outdoor unit coil heat transfer optimized.
- The op3 selection requires the Multi V demand limit I/O PCB board be installed. If the demand limit controller is installed in the master outdoor unit and a binary signal is sent to the outdoor unit via a third party source, VRF system normal operation can be interrupted and an auto dust removal cycle can be performed.

⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off–mode.
- This option is not a substitute for coil cleaning and does not completely clear the coil of all debris. A coil cleaning procedure should be included when performing regular preventative maintenance.

4.12 Compressor Max. Frequency Limit

It is a function to limit the maximum speed (frequency) of inverter compressor.

■ Setting the function

Function		Option
Compressor Max. Frequency Limit	Fn 12	oFF, op1~op9

■ Option Selection

Setting	Inverter (Hz)	Setting	Inverter (Hz)
oFF	–	op5	113
op1	143	op6	105
op2	135	op7	98
op3	128	op8	90
op4	120	op9	83

■ Detailed information

- This function is used with heat pump and heat recovery.
- All modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  Setting the maximum compressor speed can be a method to artificially downsize an outdoor unit either temporarily until all indoor units are installed on a core and shell project or permanently on projects where the outdoor unit installed has excess capacity on both heating and cooling design days.

*Note : If interested in this option, please note there is no concern a selection will inhibit proper defrost or oil return operation. The oil return requires algorithm operates the compressor at speeds that are lower than the available minimum speed selectable.

⚠CAUTION
- Ask an authorized technician to setting a function.
- If use a function, first install a central controller. (refer to the Installation manual)
- Do not depend on this option to lower the maximum current draw of the outdoor unit. The maximum speed selected is ignored by the Multi V microprocessor during defrost.

4.13 ODU Fan Max. RPM Limit

It is a function to limit the maximum RPM of ODU.

■ Setting the function

Function		Option
ODU Fan Max. RPM Limit	Fn 13	oFF, op1~op7

■ Option Selection

Setting	Max ODU Fan Speed Normal Operation / Low Ambient or Overheat Operation (RPM)	
	UXA	UXB
oFF	880 / 1000	1000 / 1150
op1	860 / 980	950 / 1100
op2	840 / 960	900 / 1050
op3	820 / 940	850 / 1000
op4	800 / 920	800 / 950
op5	780 / 900	750 / 900
op6	760 / 880	700 / 850
op7	740 / 860	650 / 800

■ Detailed information

- This function is used to limit the maximum speed of the outdoor unit fans in applications where the building owner desires to reduce the noise generated by the fans. The maximum fan speed limit set by this function is ignored for defrost operation.
- This function is used with heat pump and heat recovery.
- Heating, Cooling and Dry modes is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  No adverse operating conditions are solved using this function. The function is for convenience to provide a method to address any possible noise complaints.

⚠CAUTION
- Ask an authorized technician to setting a function.
- This option does not limit the speed of the fans during defrost operation.
- The 'ODU Fan Max. RPM Limit' and 'Night Low Noise Function' functions can be set simultaneously. MAX RPM is set to a smaller value among the set values.
- Efficiency or capacity can be changed according to option.

4.14 Smart Load Control

Smart Load Control function enables comprehensive understanding of environmental conditions in order to optimize energy efficiency. This technology allows active control of discharge refrigerant temperature which eventually increases the efficiency for average outdoor unit in comparison to the previous models.

■ Setting the function

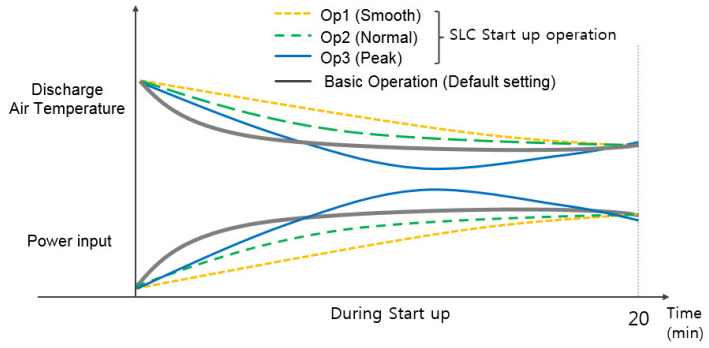
Function		Option
Smart Load Control	Fn 14	oFF, op1~op3

■ Option Selection

Setting	Start-up	Detail of function
oFF	Basic operation	SLC not selected
op1	Smooth	Slowly controlled to become target pressure
op2	Normal	Normally controlled to become target pressure
op3	Peak	Quickly controlled to become target pressure

※ Outdoor temperature Range : (Cooling) 35 ~ 20℃ / (Heating) -10 ~ 5℃

- Smooth Mode (Op1) : Maximize energy savings, rate of temperature change less important.
- Normal Mode (Op2) : Balance the rate of temperature change with energy consumed.
- Peak Mode (Op3) : Quickly cool/heat the building, energy consumption less important

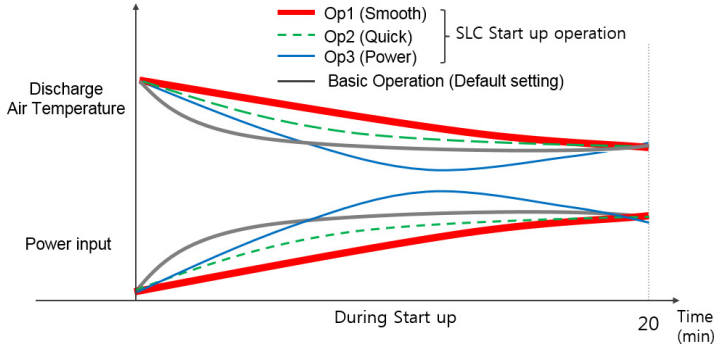


※ Outdoor temperature Range : (Cooling) 35 ~ 20℃ / (Heating) -10 ~ 5℃

■ Detailed information

- This function is used with heat pump and heat recovery.
- Heating, Cooling and Dry modes are a change in the setting impact.
- The operating symptoms that might be corrected using this function
  This feature does not correct adverse operating conditions. It is an energy enhancement feature.

ex) If outdoor setting is Op1(red line),
outdoor unit start operation slowly compared than basic operation but save energy during start-up and after start up, discharge air temperature is automatically changed according to outdoor and indoor temperature.



⚠CAUTION
· Ask an authorized technician to setting a function.

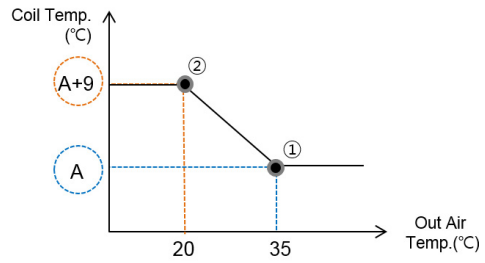
App. The Logic of Dual Sensing SLC (Smart Load Control)

- Dual Sensing SLC is controlled by 3 factors. (in case of cooling operation)
  - 1st : Outdoor temperature.
  - 2nd : 『Room temperature (T_{air}) - Setting temperature (T_{target})』
  - 3rd : Relative humidity (default : outdoor humidity)
    (Refer to indoor humidity if we applied standard III remote controller inside)

■ Cooling Operation Logic

1. Outdoor temperature effect

- The evaporation temperature of the indoor unit rises up to 9℃ according to the outdoor temperature. where A is the indoor unit coil temperature.
  ① Out air temp. (35℃) → coil temp. of indoor unit is A [℃]
  ② Out air temp. (20℃) → coil temp. of indoor unit is A+9 [℃]



2. Room temperature (T_{air}) – Setting temperature (T_{target})

- In case of 35℃ (out air temp. condition)
  & 1.5℃ ≤ Temp. gap (between room temp. and setting temp.) <2.5℃
  → Target coil temp. of indoor unit is A
  (where the relative humidity is between 50% and 70%)

T_{air} – T_{target}	Target Coil Temp. (℃)
〈 −0.5	A + 1.2
−0.5 ≤ & 〈 0.5	A + 0.8
0.5 ≤ & 〈 1.5	A + 0.4
1.5 ≤ & 〈 2.5	A
2.5 ≤ & 〈 3.5	A − 0.4
3.5 ≤	A − 0.8

High
Low
Coil temp.

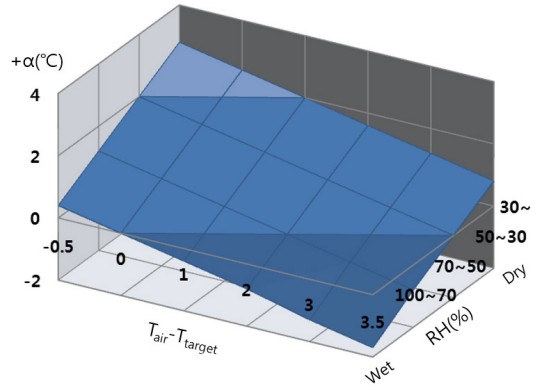
3. Relative humidity effect

- In case of 35℃ (out air temp. condition)
  - High humidity condition (RH 70 ~ 100%)
  : Target coil temp. is lower than the standard humidity condition (RH 50~70%)

RH(%)	100~70	70~50	50~30	30~
$T_{air}-T_{target}$	Target Coil Temp.			
〈−0.5	A+0.4	A+1.2		
−0.5 ≤ & 〈 0.5	A	A+0.8		
0.5 ≤ & 〈 1.5	A−0.4	A+0.4		
1.5 ≤ & 〈 2.5	A−0.8	A		
2.5 ≤ & 〈 3.5	A−1.3	A−0.4		
3.5 ≤	A−1.7	A−0.8		

  - Low humidity condition (RH 50 ~ 0%)
  : Target coil temp. is less than the standard humidity condition (RH 50~70%)

RH(%)	100~70	70~50	50~30	30~
$T_{air}-T_{target}$	Target Coil Temp.			
〈−0.5		A+1.2	A+2.0	A+2.8
−0.5 ≤ & 〈 0.5		A+0.8	A+1.6	A+2.4
0.5 ≤ & 〈 1.5		A+0.4	A+1.2	A+2.0
1.5 ≤ & 〈 2.5		A	A+0.8	A+1.6
2.5 ≤ & 〈 3.5		A−0.4	A+0.4	A+1.2
3.5 ≤		A−0.8	A	A+0.8



4.15 Humidity Reference

It is the function to set whether to use the humidity sensor. The outdoor unit considers the current outdoor ambient humidity condition when making adjustments to the control values of the refrigeration cycle.

■ Setting the function

Function		Option
Humidity Reference	Fn 16	on, oFF

■ Option Selection

Setting	Detail of function
on	Humidity sensor use
oFF	Not setting (Default)

■ Detailed information

- The humidity sensor's real time reporting of the outdoor ambient humidity level is used in the Advanced Smart Load Control (FN14), Comfort Cooling (ID10), and Intelligent Defrost – Smart Heating (core logic) to prepare the system for changes in the building load.
- This function is used with heat pump and heat recovery.
- Heating, Cooling and Dry modes is a change in the setting impact.
- Cooling / Heating operation by using humidity sensor (Option "on")
  - When used cooling operation of SLC function, it will improve energy efficiency because evaporation temperature will be decreased
  - When used heating operation in case of high humidity condition, deforest will be delayed because target high/low pressure will be changed.
- Activation function by using humidity sensor (Option "on")

		Multi V Ⅳ	Multi V Ⅳ	Multi V 5	Multi V 5	Multi V 5
		SLC	Comfort Cooling	Dual Sensing SLC	Dual Sensing Comfort Cooling	Increased heating time(Frost delay)
Operation	cooling	O	O	O	O	X
	Heating	O	X	X	X	on
Consider-ation	Temperature	O	O	O	O	O
	Humidity	X	X	O	O	O

⚠CAUTION
· Ask an authorized technician to setting a function.

4.16 The Connecting of Central Control at IDU Terminals

This function allows the field connection of the AC-EZ central controller to the indoor unit communications buss on Multi V 5.

■ Setting the function

Function		Option
The Connecting of Central Control at IDU Terminals	Fn 19	on, oFF

■ Option Selection

Setting	Detail of function
on	AC EZ connection
oFF	Not setting (Default)

■ Detailed information

- This function is used with heat pump and heat recovery.

⚠CAUTION

· Ask an authorized technician to setting a function.

4.17 Compressor Input Current

This function is used when the current management is required by proportionally reducing the maximum MFA specification of the product.

■ Setting the function

Function		Option
Compressor Input Current	Fn 20	oFF, op1~op10

■ Option Selection

Setting	Compressor input current limit (%)	Setting	Compressor input current limit (%)
oFF	–	op6	70
op1	95	op7	65
op2	90	op8	60
op3	85	op9	55
op4	80	op10	50
op5	75		

■ Detailed information

- This function is used with heat pump and heat recovery.
- All modes are a change in the setting impact.
- Since the MFA value is different for each HP and the value is limited proportionally, it does not mean that the option value differs for each chassis.
  (Maximum current value for each model is stored in EEPROM in main PC)

⚠CAUTION

· Ask an authorized technician to setting a function.
· If do not use a function, set an off-mode.
· If use a function, capacity may go down.

4.18 The Smart Plug

It is a function that displays the power consumption on the wired remote control when the outdoor unit is operating.

■ Setting the function

Function		Option
The Smart Plug	Fn 21	SPL0, SPL1, Pd10, Pd11

■ Option Selection

Setting		Detail of function
SPL0	oFF	Smart Plug Logic OFF (Default)
SPL1	Pd10	PDI non-installation
	Pd11	PDI installation

- Pd10 - Monitor the value from the watt hour meter.
- Pd11 - Monitor the calculated value in the outdoor unit. (error ± 5%)

■ Detailed information

- This function is used with heat pump and heat recovery.
- All modes is a change in the setting impact.
- When the optional PDI is installed, the PDI monitors outdoor unit power consumption as well as indoor unit power consumption. PDI allocates outdoor unit power consumed to indoor units based on the volume of refrigerant flow through each indoor unit during the billing period. For VRF systems without the PDI, outdoor unit power consumption is reported, however indoor unit power consumption is ignored.
- If the Smart Plug function is turned on, the power consumption data may be viewed using one of LG's central control/monitoring devices such as ACP, AC Smart, or the multi site communications manager. For installations where a third party BMS system Is present, consumption data is also made available for viewing at the BMS front end using LG's BACnet gateway.

⚠CAUTION
- Ask an authorized technician to setting a function.
- When PDI is installed, be sure to set the outdoor unit option to PDI ('PDI1').
  (If the setting is not set to PDI1, the value displayed on the remote control may differ from the actual value.)
- It is possible to check the power consumption during operation while setting the function, but it can differ value compared to actual power consumption.

4.19 Overall Defrost Entrance for Low temperature

It is a function to operate overall defrost.

■ Setting the function

Function		Option
Overall Defrost Entrance for Low temperature	Fn 22	on, oFF

■ Option Selection

Setting	Detail of function
on	Overall defrost
oFF	Default

■ Detailed information

- This function is used with heat pump and heat recovery.
- Heating modes is a change in the setting impact.
- Overall defrost operates every 3 hours whenever the outdoor air temperature is below 10℃. (If defrosting is not possible for 3 hours)
- This function may be used in any location. It is most likely used in climates where moisture levels are high the outdoor unit's heating capacity is slightly undersized, the condenser coil is partially restricted, or other local factors dictate that no frost must be allowed to build on the coil.

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

4.20 Optional Base Panel Heater

It is a function to prevent freezing of ODU base pan in a cold area.

■ Setting the function

Function		Option
Optional Base Panel Heater	Fn 23	on, oFF

■ Option Selection

Setting	Detail of function
on	Base pan heater kit installation
oFF	Base pan heater kit non-installation (Default)

■ Detailed information

- This function is used with heat pump and heat recovery.
- Heating mode is a change in the setting impact.
- The operating symptoms that might be corrected using this function
  Reduces ice-build up in the bottom of the unit that may occur in some installation scenarios where drainage holes in the bottom pan of the unit are obstructed or where the surface temperature of the bottom pan is below freezing.
- The optional base pan heater maintains the bottom surface of the outdoor unit at a temperature above 0℃ to keep condensate water in a liquid state while in the base pan. When the surface temperature of the base pan is above 0℃, the condensate flows into channels formed in the pan that guide the flow of water to one-inch diameter holes in the base pan along the bottom of the channels in which water flows out the bottom of the unit. If the base pan surface temperature is below 0℃, the condensate that contacts the surface of the pan will freeze preventing it from flowing in the channels to the holes. As a result ice may build up in the bottom of the unit.
- Using this setting, it allows a third party heater to be energized to keep the bottom surface of the unit at a temperature above 0℃.

⚠CAUTION
- Ask an authorized technician to setting a function.
- If do not use a function, set an off-mode.
- Heater is accessory.(sold separately)

5. SVC Mode

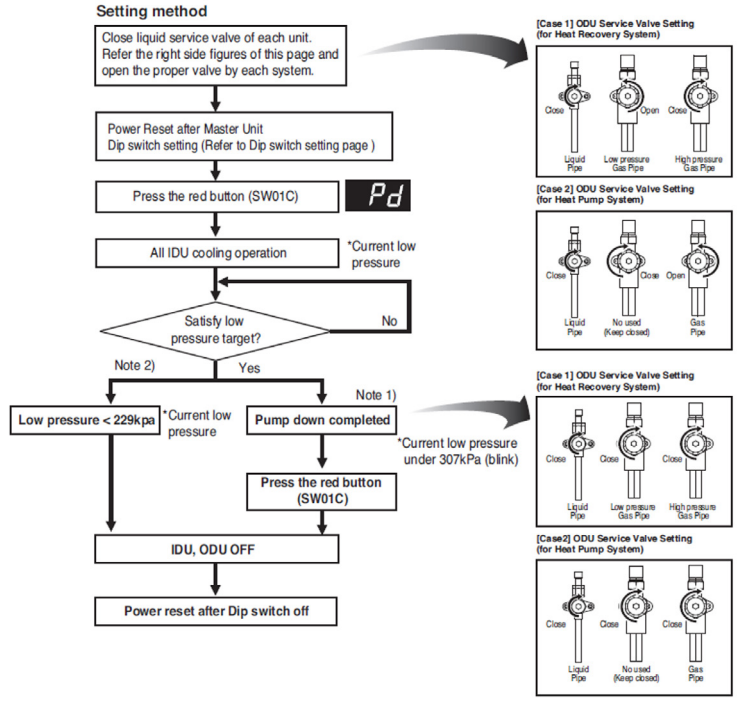
5.1 Pump Down

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

■ Setting the function

Function		Option
Pump Down	SE 1	Pd (display "Low Pressure"), oFF

■ Flow Chart



*Note 1) If low pressure become under 307kPa,close the gas service valve of all ODU immediately.
*Note 2) If low pressure descends below 229kPa, the system turns off automatically. Close the gas service valve immediately.

■ Detailed information

• This function is used with heat pump and heat recovery.

*Note : The amount of refrigerant that can be pumped out is limited by the amount of refrigerant that can be stored in the outdoor unit and additional refrigerant storage containers may need to be used. The maximum amount of refrigerant for Multi V 5 is size dependent and varies between 14.3 and 37.5 lbs / frame. If the system charge is greater than the volume that can be stored, a supplemental storage device will be required to totally evacuate the system.

⚠CAUTION

· Use pump down function within guaranteed temperature range.
  - IDU : 20~32℃ [68~89.6℉] / ODU : 5~40℃ [41~104℉]
· Make certain that IDU doesn't run with thermo off mode during operation.
· Maximum operation time of pump down function is 30 min. (in case low pressure doesn't go down)

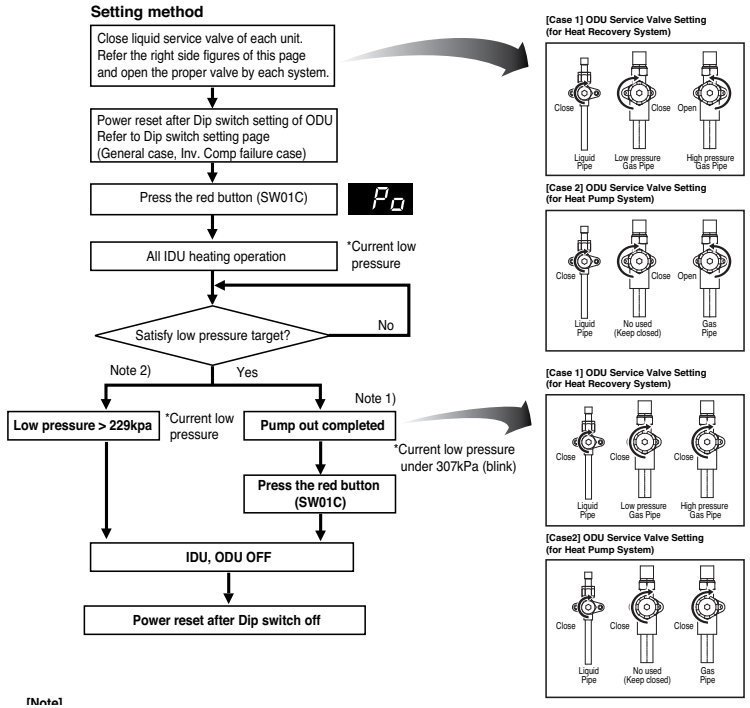
5.2 Pump Out

This function gathers the refrigerant to other ODU and IDU.
Use this function in case of compressor failure, ODU parts defect, leakage.

■ Setting the function

Function		Option
Pump Out	SE 2	Po (display "Low Pressure"), oFF

■ Flow Chart



[Note]

*Note 1) If low pressure become under 307kPa, close the gas service valve of all ODU immediately.

*Note 2) If low pressure descends below 229 kPa, the system turns off automatically. Close gas service valve immediately. This function is operating only Heat Pump model.

■ Detailed information

• This function is used with heat pump and heat recovery.

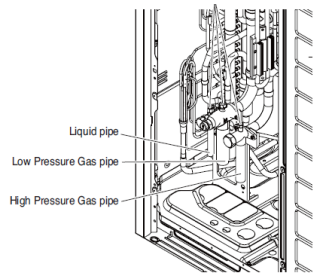
*Note : In systems with short piping systems, the amount of refrigerant that can be pumped from the outdoor unit may be limited and additional refrigerant storage containers may need to be used.

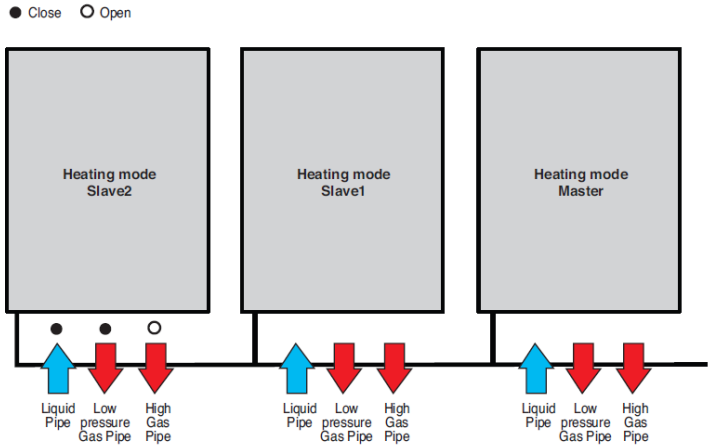
⚠CAUTION

- Use pump out function within guaranteed temperature range.
  - IDU : 10~32℃ [50~89.6℉] / ODU : 5~40℃ [41~104℉]
- Make certain that IDU doesn't run with thermo off mode during operation.
- Pump out function takes 2~5 min. after compressor start.
  Make certain that IDU doesn't run with thermo off mode during operation.
  (in case low pressure doesn't go down)

■ Example (Slave2 ODU inverter compressor failure)

• For Heat Recovery System

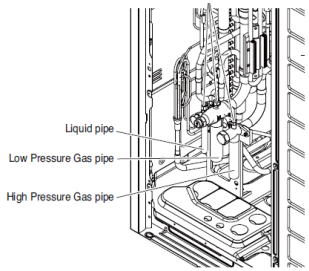


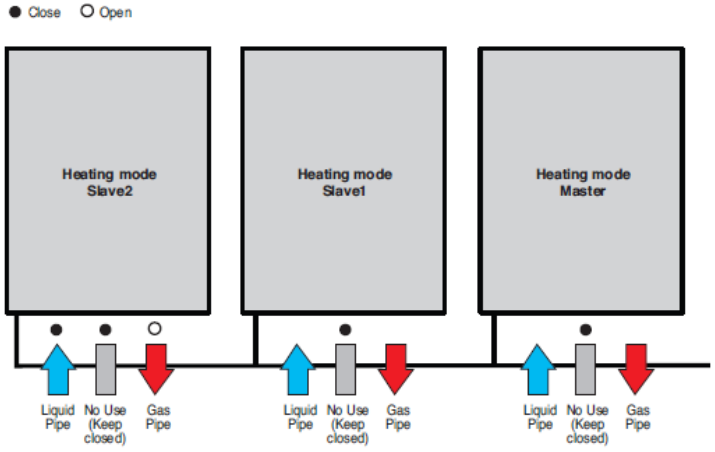


1. Close liquid pipe and low pressure gas pipe of the unit for pump out operation.
2. Operate pump out.
3. Close high pressure gas pipe of unit after completion.
4. End pump out.
5. After replacing the compressor, eliminate remaining refrigerant of corresponding ODU and perform vacuum work. (with vacuum mode)
6. Add the refrigerant with auto charging function.

■ Example (Slave2 ODU inverter compressor failure)

• For Heat Pump System





1. Close liquid pipe of the unit for pump out operation.
2. Operate pump out.
3. Close gas pipe of unit after completion.
4. End pump out.
5. After replacing the compressor, eliminate remaining refrigerant of corresponding ODU and perform vacuum work. (with vacuum mode)
6. Add the refrigerant with auto charging function.

5.3 Vacuum

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

■ Setting the function

Function		Option
Vacuum	SE 3	Vacc, oFF

■ Detailed Information

• This function is used with heat pump and heat recovery.

• If the vacuum mode start, ODU valve / ODU & IDU EEV open with "Vacc" display.

• Vacuum mode cancellation method
: Push the reset button on master unit PCB after setting all dip s/w oFF.

*Note : Isolation valves, manual shutoff valves, or 3rd party electronically operated valves, and non-operating or malfunctioning electronic valves must be opened manually prior to initiating service setting SE3.

⚠CAUTION
· ODU operation stops during vacuum mode. compressor can't operate.

5.4 Back Up

This function is used when backing up outdoor units or compressors.

■ Setting the function

Function	
Back Up	SE 4

■ Manual Back Up

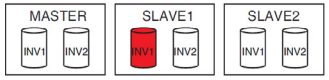
This function allows the system to operate in case of inverter compressor failure by backing up compressor manually.
Service can be asked by displaying error to the customer every 6 hours.

• Option Setting

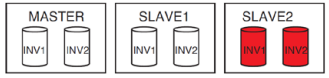
Option	Detail of function
Unit	Outdoor unit back up
Inv1	Inverter compressor No.1 back up
Inv2	Inverter compressor No.2 back up

• Operation Method
1) Check which compressor is broken. (refer to "Trouble Shooting Guide")
2) Turn off the power.
3) Set the dip S/W of defective outdoor unit.
4) Turn on the power.

ex1) Inverter SLAVE1 compressor fail of Slave1 → option "Inv1" selection



ex2) Unit fail of Slave2 → option "Unit" selection

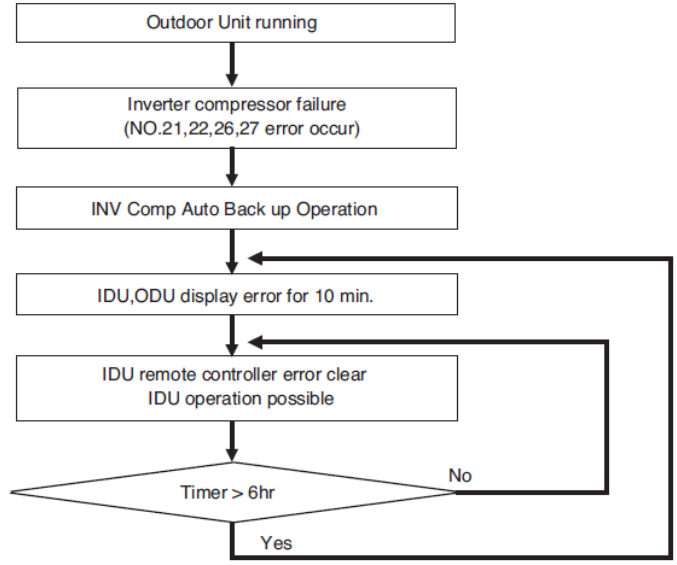


* In 1comp model, setting the 'inv2' can not be used.
* If you make a backup of compressor in 1comp model, the outdoor unit is automatically backed up.

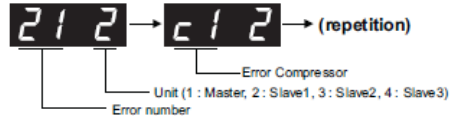
⚠CAUTION
- Manual back up function mode is applied after push the main PCB reset button.
- You must set the function of the outdoor unit to be backed up.
- If you want to disable the backup, please set the 'off'.
- This function is a temporary, do not forget to turn this function off after replacing compressor. Long term use of this function will lead to multiple compressor failures on the system.

■ Auto Back Up

This function allows the system to operate in case of inverter compressor failure by backing up compressor automatically.
Service can be asked by displaying error to the customer every 6 hours.



ex) Slave1 unit Inverter compressor 1 start failure error No. 21 occur



⚠CAUTION
- Request service immediately if error occurs.
- Auto back up is set up to 1 inverter compressor.
- If Inverter compressor auto back up starts, error displays for 10 min. every 6 hours.
- Error displays continuously at the corresponding ODU.

5.5 Forced Oil Return

This function is used in recovering the oil level of the compressor through recollecting the accumulated oil in the pipe.

■ Setting the function

Function		Option
Forced Oil Return	SE 5	01, oFF

■ Option Selection

Setting	Detail of function
oFF	Off (Default)
01	Oil return on

■ Detailed information

- This function is used with heat pump and heat recovery.
- Automatically disabled the forced oil return function after finishing oil return function.

⚠CAUTION
· If a compressor is lost and it is unknown if oil is trapped in the pipeline, ask an authorized technician.

5.6 Forced Defrost

This function is used in defrosting of heat exchanger.

■ Setting the function

Function		Option
Forced Defrost	SE 6	Def, oFF

■ Option Selection

Setting	Detail of function
oFF	Off (Default)
Def	Defrost on

■ Detailed information

- This function is used with heat pump and heat recovery.
- Automatically disabled the forced defrost function after finishing manual defrost.

5.7 Display Cycle Information

This function is to display the main parameter value displayed by LGMV in real time through the 7-segment of the master outdoor unit for smooth operation when the LGMV cable is faulty or missing. The 7 segment is display 26 different cycle data.

■ Setting the function

Function		Option
Display Cycle Information	SE 8	op1~op26

■ Option Selection

step	Tittle	7-seg	example	seg_1	seg_2	seg_3	seg_4
op1	Current High Pressure	P1	4321 kPa	4	3	2	1
op2	Current low Pressure	P2	1234 kPa	1	2	3	4
op3	Inv 1 Pulse	h1	120 Hz		1	2	0
op4	Inv 2 Pulse	h2	30 Hz			3	0
op5	fan rpm	h3	110 RPM		1	1	0
op6	Subcooling degree	T1	53℃			5	3
op7	Superheating degree	T2	−4.5℃		-	4	5
op8	ODU temp.	T3	10℃		1	0	0
op9	Suctino temp.	T4	43.4℃		4	3	4
op10	Comp1 discharge temp.	T5	150℃		1	5	0
op11	Comp2 discharge temp.	T6	124℃		1	2	4
op12	Liquid pipe temp.	T7	10℃		1	0	0
op13	Sc_in	T8	10℃		1	0	0
op14	Sc_out	T9	10℃		1	0	0
op15	hex_total	T10	10℃		1	0	0
op16	hex_hi	T11	10℃		1	0	0
op17	hex_low	T12	10℃		1	0	0
op18	Inlet pipe temp of IDU	T13	−10℃	-	1	0	0
op19	main1 eev	PLS1	1950 pls	1	9	4	0
op20	main2 eev	PLS2	32 pls			3	2
op21	sc eev	PLS3	16 pls			1	6
op22	oil eev	PLS4	50 pls			5	0
op23	vi eev1	PLS5	1350 pls	1	3	5	0
op24	vi eev2	PLS6	50 pls				8
op25	IDU running capacity	IDU1	24 KBtu			2	4
op26	Total number of IDU	IDU2	10 EA			1	0

■ Detailed information

- This function is used with heat pump and heat recovery.

5.8 Noise Reduction

It is a function to reduce the noise of the entire system.

■ Setting the function

Function		Option
Noise Reduction	SE 9	oFF, op1~op2

■ Option Selection

Option	Detail of function
oFF	Normal operation (Fast cooling & Fast heating)
op1	Powerful Refrigerant noise reduction
op2	Mild Refrigerant noise reduction Mode

- oFF : Performance priority
- op1 : Refrigerant noise reduction priority
  (Initial indoor EEV 120 pls / compressor Hz slow up, Europe model default)
- op2 : Mid mode between OFF and OP1
  (Initial indoor EEV 150 pls)

■ Detailed information

- This function is used with heat pump and heat recovery.
- In case of SE9, it is an option to set control based on an outdoor unit. It is a function to control (reduce) the noise of the entire system, not to control noise in individual indoor units.
  That is, it is all indoor unit control, not individual indoor unit control. Individual indoor unit control is possible through indoor unit setting option.
- Differences between SE9 and SE11
  - SE9 (Noise Reduction): outdoor unit noise control + indoor unit noise control
  - SE11 (Heating fan Low noise): outdoor unit fan noise control
    (control factor : the outdoor temperature, heat exchanger temperature, indoor unit operation rate, not always controlled)

⚠CAUTION
· Ask an authorized technician to setting a function.
· Change a power consumption or efficiency.

5.9 Entry Heating Oil Return

This function is for performing oil recovery operation while heating operation.
The refrigerant noise claim occurs due to repetition of oil recovery operation, this function will be checked and applied.

■ Setting the function

Function		Option
Entry Heating Oil Return	SE 10	oFF, on

■ Option Selection

Option	Detail of function
oFF	Default
on	Operate entry heating oil return

■ Detailed information

- This function is used with heat pump and heat recovery.
- If the oil level is not recovered and cycle issue such as high pressure rise / low-pressure drop after the oil recovery in the heating mode, the oil recovery is performed in the cooling mode.
- It is effective if the heating operation rate is high and the possibility of occurrence of cycle issue is low due to installation / operation conditions, however, if a cycle issue occurs, it may be ineffective by re-entering the cooling mode.

⚠CAUTION
· Ask an authorized technician to setting a function.
· If a cycle issue occurs, check the cycle by performing forced oil recovery operation (SE5).

5.10 Heating Fan Low Noise

It is a function to reduce outdoor fan max rpm by adjusting low target pressure while heating mode.

■ Setting the function

Function		Option
Heating Fan Low Noise	SE 11	oFF, on

■ Option Selection

Option	Detail of function
oFF	Off (Default)
on	Function enabled

■ Detailed information

- This function is used with heat pump and heat recovery.
- The fan rpm is reduced by about 50 to 70% and may vary depending on environment and logic.
- Differences between SE9 and SE11
  - SE9 (Noise Reduction): outdoor unit noise control + indoor unit noise control
  - SE11 (Heating fan Low noise): outdoor unit fan noise control
    (control factor : the outdoor temperature, heat exchanger temperature, indoor unit operation rate, not always controlled)

ex) In case of SE11, optimize fan noise by adjusting the target low pressure when the outdoor temperature is more than 5℃, the indoor unit operation rate is less than 30%, and the heat exchanger temperature is more than 3℃

⚠CAUTION
· Ask an authorized technician to setting a function.
· Change a power consumption or efficiency.

5.11 Number of Partial Defrosts

This function is used for continuous heating control by option setting split defrost (heating cycle, upper / lower valve control)

■ Setting the function

Function		Option
Number of Partial Defrosts	SE 12	oFF, op1~op11

■ Option Selection

Option	Maximum Partial Defrost Cycles	Option	Maximum Partial Defrost Cycles
oFF	None (Default)	op6	6
op1	1	op7	7
op2	2	op8	8
op3	3	op9	9
op4	4	op10	10
op5	5	op11	11

■ Detailed information

- This function is used with heat pump and heat recovery.

* *Note* : In order to prevent the accumulation of ice on the side of the outdoor unit, it is considered that the number of partial defrost is minimized and that overall defrost is effective on the outdoor unit side. however, on the indoor unit side, frequent overall defrost can cause the lack of heating (according conversion to cooling cycle).

⚠CAUTION
· Ask an authorized technician to setting a function.
· Change a power consumption or efficiency.

5.12 Level Changes of CH200

It is a function to change CH200 error level.

■ Setting the function

Function		Option
Level Changes of CH200	SE 14	oFF, on

■ Option Selection

Option	Detail of function
oFF	level 3 (CH200 display, system off, default)
on	level 4 (CH200 display, system on)

■ Detailed information

- This function is used with heat recovery.
- In case CH200 occurs because of communication error or individual breaker,
  - Option is 'ON' → Changes to level4 and system on with CH200 display
  - Option is 'OFF' → Changes to level3 and system off with CH200 display.

4.13 Level Changes of CH53

It is a function to change error level in the state of CH53.

■ Setting the function

Function		Option
Level Changes of CH53	SE 15	oFF, on

■ Option Selection

Option	Detail of function
oFF	level 4 (CH53 display, system on, default)
on	level 4 (CH53 display, system on)

■ Detailed information

- This function is used with heat pump and heat recovery.
- In case CH200 occurs because of communication error or individual breaker,
  - System operation is possible with level4 regardless of option setting.
  - But after setting the option 'on', if CH21, 26, 29, or 116 occurs in the state of CH53, the system will not operate because it is switched to level 1.

6. IDU Mode

6.1 EEV Pulse of Non-operating IDU in Heating

It is the function to adjust EEV pulse of no IDU in heating.

■ Setting the function

Function		Option
EEV Pulse of Non-operating IDU in Heating	Id 1	seg1, seg2 : IDU No. seg3, seg4 : EEV * 10pls

■ Option Selection

seg1, seg2	seg3, seg4
1 ~ 64	40 ~ 120 * 10pls

- EEV pulse can be set in units of 10pls from 150 to 300pls. ('0': No setting)

■ Detailed information

- This function is used with heat pump and heat recovery.
- It is a function to take action in case of unusual issue in the field.

ex) EEV pulse of indoor unit is typically 80pls. (different by model)
① Claims due to refrigerant noise in non-operating IDU → EEV pulse ▼
② Refrigerant shortage cycle non-operating IDU during low load operation → EEV pulse ▲

⚠CAUTION
· Ask an authorized technician to setting a function.
· If the EEV pulse is large, the risk of noise generation may increase and if the EEV pulse is small, the risk of liquid accumulation may increase.

6.2 Set IDU Superheat / Set IDU Subcool

This function is used to set additional superheat and subcool in the indoor unit.

■ Setting the function

Function		Option
Set IDU Superheat	Id 2	seg1, seg2 : IDU No. seg3, seg4 : IDU Superheat
Set IDU subcool	Id 3	seg1, seg2 : IDU No. seg3, seg4 : IDU Subcool

■ Option Selection

seg1, seg2	seg3, seg4	
	IDU Superheat	IDU subcool
1 ~ 64	-9 ~ +9	-5 ~ +9

- Set EACH IDU : Select "Idu" → "Id2 or 3" → EACH → Select Indoor Unit No. → Set Value
- Set All IDU : Select "Idu" → "Id2 or 3" → ALL → Set Value

■ Detailed information

- This function is used with heat pump and heat recovery.

- In cooling mode,
  1) IDU Superheat ▲ → refrigerant flow ▼ → refrigerant noise ▼ & performance ▼
  2) IDU Superheat ▼ → refrigerant flow ▲ → performance ▲
     (Caution to the performance down of other indoor units and liquid compression)

- In heating mode,
  1) IDU Superheat ▲ → refrigerant flow ▼ → refrigerant noise ▼ & performance ▼
  2) IDU Superheat ▼ → refrigerant flow ▲ → performance ▲
     (Caution to the performance down of other indoor units)

⚠CAUTION
· Ask an authorized technician to setting a function.

6.3 Set Auto Pipe Detection / Start Auto Pipe Detection

The function that sets connection relationship automatically between the indoor unit and heat recovery unit.

■ Setting the function

Function		Option
Set Auto Pipe Search	Id 5	oFF, Ath, Atc, Nor
Start Auto Pipe Search	Id 6	oFF, StA

■ Option Selection

Set Auto Pipe Detection		Start Auto Pipe Detection	
Option	Detail of function	Option	Detail of function
oFF	None (Default)	oFF	None (Default)
Ath	Mode1	StA	Start Pipe Search
Atc	Mode2	-	-
Nor	Manual Pipe Search	-	-

- "Atc" Setting : Outdoor temperature is over 15℃(59℉) (If it fail, use "Ath")
- "Ath" Setting : Outdoor temperature is below 15℃(59℉) (If it fail, use "Atc")

■ Detailed information

1. Auto Pipe Detection
   - 5~30 minutes are required depending on the number of the indoor units and outdoor temperature.

   - The number of the indoor units connected is displayed on7-Segment of the outdoor unit main PCB for about 1 minute.

   - In case of auto pipe detecting error, '200' is displayed .

   - Auto pipe detection process is completed after '88' is disappeared.

⚠CAUTION
- Execute auto pipe detection again whenever the indoor PCB and HR unit PCB is replaced.
  - Operation error occurs unless power is supplied to the indoor and HR units.
- Error No.200 occurs if the number of connected indoor units and that of scanned indoor units are different.
- If auto pipe detection process fails, complete it with manual pipe detection (see Manual pipe detection part).
- If auto pipe detection process is completed normally, manual pipe detection is not required.
- If you want to do auto pipe detection again after auto pipe detection fails, do after reset of outdoor unit by all means.
- During 5 minutes after pipe detection is completed, do not turn off the main unit PCB to save the result of pipe detection automatically.

2. Manual Pipe Detection
- Procedure
  1) Enter the central control address into each indoor unit using its wired remote controller.
  2) Turn No.1 of DIP s/w SW02M of HR unit PCB on.
  3) Reset the power of HR unit PCB.
  4) On the HR unit PCB, manually set address of each valve of the HR unit to the central control address of the indoor unit connected to the valve.
  5) Reset the power of outdoor unit PCB.
  6) The number of the indoor unit installed is displayed after about 5 minutes.
     ex) HR → The number of the indoor
  7) Reset the power of outdoor unit PCB, HR unit.
  8) Manual pipe detection is completed

⚠CAUTION
- In case that central controller is not installed, firstly set up central controller's setting to make address setting of indoor units.
- In case that central controller is installed, please set central control address in wired remote control of indoor unit.
- HR unit's manual pipe address is set by the central control adress of indoor units.
- Address of valve which is not connected with indoor unit should be set differently with the address of a valve which is indoor unit connected (If address is overlapped valve will not work preperly).
- If there occurs some error during pipe detection process, it means pipe detection process is not properly finished.
- If an error occurred, it means that manual pipe setting is not completed.
- During 5 minutes after pipe detection process is completed, do not turn off the main outdoor unit's PCB to save the result of pipe detection automatically.

6.4 Set Zone Master

It is a function to operate according to the mode of the master indoor unit when several indoor units are connected to one of the branch of the heat recovery model.

■ Setting the function

Function		Step	Option
Set Zone Master	Id 7	1	seg1 : Branch No. seg2 : Pipe No.
		2	seg3, seg4 : IDU No.

■ Option Selection

seg1	seg2	seg3, seg4
1 ~ G	1 ~ 4	1 ~ 64

■ Detailed information
- This function is used with heat recovery.

- Operation
  Step 1 : Branch No. (using '◀' button) & Pipe No. setting (using '▶' button)
  Step 2 : Indoor Unit No.(using '◀" ▶' button)
  (The number of the indoor unit to be displayed is the number of the indoor unit connected to the zone selected in step 1)
  * To proceed to next stpe, press SW01C (●: execute) button.

⚠CAUTION
- Ask an authorized technician to setting a function.

6.5 Operating IDU Low Noise

This function is used to reduce refrigerant noise when the indoor unit starts to run for heat recovery system.

■ Setting the function

Function		Step	Option
Operating IDU Low Noise	Id 8	1	seg1, seg2 : - seg3, seg 4 : IDU No.
		2	seg1 : 1, 2 seg2, seg3, seg4 : -
		3	seg,1, seg 2 : - seg 3,4 : EEV pulse

■ Option Selection

Step		seg1	seg2	seg3, seg4
1		-	-	1 ~ 64
2		1 (Cooling) / 2 (Heating)	-	–
3	Cooling ('1' in step 2)	-	-	0, 13 ~ 17 (13 0 ~ 170pls)
	Heating ('2' in step 2)	-	-	0, 1 (140pls)

- Impossible to set all indoor unit at once Only possible to set each indoor unit

■ Detailed information

- This function is used with heat recovery.

⚠CAUTION
· Ask an authorized technician to setting a function.
· Maintain setting EEV pulse when the indoor unit starts to run for about 3min.

6.6 In Cooling IDU EEV Max. Pulse

It is the function to prevent excessive opening by setting EEV maximum pulse of indoor unit in cooling.

■ Setting the function

Function		Option
In Cooling IDU EEV Max. Pulse	Id 9	seg1, seg2 : IDU No. seg3, seg4 : Max. EEV * 10pls

■ Option Selection

seg1, seg2	seg3, seg4
1 ~ 64	150 ~300 * 10pls

- Maximum EEV pulse can be set in units of 10pls from 150 to 300pls. ('0': No setting)
- Set EACH IDU : Select "Idu" → "Id9" → EACH → Select Indoor Unit No. → Set Value
- Set All IDU : Select "Idu" → "Id9" → ALL → Set Value

■ Detailed information

- This function is used with heat pump and heat recovery.
- In cooling mode, the typical normal maximum pulse is 600. If superheat is too low, you can restrict IDU max pulse to reduce noise in cooling caused by valve hunting.
- Adjust operating range to stop hunting and stop noise
  EEV valve normal range 0 ~ 1350 pulse
  EEV in cooling typically open 〈 600 pulse, never greater than 1000 pulse
  EEV in heating typically 8 ~ 1350 pulse
  Maximum open can be adjusted down to 300 pulse

⚠CAUTION
· Ask an authorized technician to setting a function.

6.7 Comfort Cooling

It is function to reduce the ODU energy consumption by the continuous operation without thermo off.

■ Setting the function

Function		Option
Comfort Cooling	Id 10	seg1, seg2 : IDU No. seg3, seg4 : 0, 1~3

■ Option Selection

seg1, seg2	seg3, seg4	seg3, seg4
1 ~ 64	0	No setting
	1	Cooling capacity low, Power consumption low
	2	Cooling capacity mid, Power consumption mid
	3	Cooling capacity high, Power consumption high

- Set EACH IDU : Select "Idu" → "Id10" → EACH → Select IDU No. → Set Value
- Set All IDU : Select "Idu" → "Id10" → ALL → Set Value

■ Detailed information

- This function is used with heat pump and heat recovery.
- Possible setting condition
  Indoor setting temperature - Indoor temperature 〈 −2℃
- Operation
  - Exist Indoor unit humid sensor : Use Indoor unit humid Value
  - Non Exist Indoor unit humid sensor : Use Default Value
  - Accurate superheat control using calculated values

⚠CAUTION
· For detailed logic, please refer to the next appendix page.

App. The Logic of Comfort Cooling

- Comfort Cooling means the superheat control of indoor unit.
  : Changes the refrigerant flow rate of each indoor unit by EEV
- Comfort Cooling is controlled by 2 factors.
  - 1st : 『Room temperature (Tair) - Setting temperature (Ttarget)』
  - 2rd : Relative humidity (default : outdoor humidity)
    (Refer to indoor humidity if we applied standard III remote controller inside)

■ Cooling Operation Logic

1. Room temperature (T_{air}) - Setting temperature (T_{target})

- In case of standard humidity condition
  - condition.1 : superheat adjustment value is 0 (comfort cooling step.1 setting)
    * refer to next slide (remote controller setting)
  - condition.2 : relative humidity is between 50% and 70%

T_{air} - T_{target}	Superheat Temp. Variation (℃)
〈 −0.5	+2
−0.5 ≤ & 〈 0.5	+2
0.5 ≤ & 〈 1.5	+1
1.5 ≤ & 〈 2.5	+1
2.5 ≤ & 〈 3.5	0
3.5 ≤	0

2℃ High

0℃ Low

superheat

2. Relative humidity effect

- In case of high humidity condition (RH 100 ~ 70%)
  - No superheat temp. variation (not related with Tair - Ttarget)
- In case of low humidity condition (RH 50 ~ 30%)
  - heat temp. variation was increased up to +3℃ (max)

RH(%)	100~70	70~50	50~30	30~
$T_{air}-T_{target}$	Target Coil Temp.			
〈 −0.5	0	+2	+3	
−0.5 ≤ & 〈 0.5	0	+2	+3	
0.5 ≤ & 〈 1.5	0	+1	+2	
1.5 ≤ & 〈 2.5	0	+1	+2	
2.5 ≤ & 〈 3.5	0	0	+1	
3.5 ≤	0	0	+1	

6.8 Non-operating IDU Subcool

It is function to reduce refrigerant noise that might be heard when non-operating IDU EEV is opened to recover liquid accumulated inside IDU.

■ Setting the function

Function		Option
Non-operating IDU Subcool	Id 11	seg1, seg2 : IDU No. seg3, seg4 : IDU Subcool

■ Option Selection

seg1, seg2	seg3, seg4	
1 ~ 64	0	Default
	1	Add 1℃ of IDU subcool
	⋮	⋮
	7	Add 7℃ of IDU subcool

- Set EACH IDU : Select "Idu" → "Id11" → EACH → Select Indoor Unit No. → Set Value
- Set All IDU : Select "Idu" → "Id11" → ALL → Set Value

■ Detailed information

- This function is used with heat pump and heat recovery.

⚠CAUTION
· Ask an authorized technician to setting a function.

6.9 Set IDU Superheat For Fan

It is a function to alleviate dew condensation on indoor unit panel by setting additional superheat according to the indoor air volume when moisture is continuously generated or input into the room.

■ Setting the function

Function		Option
Set IDU Superheat for Fan	Id 12	seg1, seg2 : IDU No., seg3, seg4 : IDU Superheat

■ Option Selection

seg1, seg2	seg3, seg4			
	Option	Step 1	Step 2	Step 3
1 ~ 64	0	0	0	0
	1	0	+1	+2
	2	+1	+2	+3
	3	+2	+3	+4

- Set EACH IDU : Select "Idu" → "Id12" → EACH → Select Indoor Unit No. → Set Value
- Set All IDU : Select "Idu" → "Id12" → ALL → Set Value

■ Detailed information

- This function is used with heat pump and heat recovery.
- In high humidity region, this option can be applied to prevent dew condensation
- Set step1 ~ step 3 to each or all IDU according to field condition (high humidity)

⚠CAUTION
· This function reduces IDU capacity when fan speed reduces by raising superheat as fan speed lowers
· When setting this function, the temperature of the indoor unit may rise by about 1 ℃ ~ 4 ℃.
· When used with the target pressure adjusting function (Fn8), the temperature of the indoor unit connected to the same outdoor unit may rise as well.

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