

문서번호	KUKJE-127
Order No.	CWROM-1606-00197
P/No.	MFL50024811

최종 컨펌일자 :

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개정일자 : 2016-6-1

- QA 요청사항 : 1. 원고에 지시된 대로 작업한 후 이상없이 작업 되었는지 재차 검토 후 PDF 파일을 생성한다.
 2. 작업완료 후 담당 연구원에게 수정부분에 대한 검증요청한다.
 (***) 반드시 필요 - 의뢰자가 요청한 의도대로 작업이 정확히 되었는지 반드시 확인이
 필요함)
 3. 아래 체크리스트에 따라 놓치기 쉬운 사항을 우선으로 한번 더 확인한다.

* 필수확인 - QA요구사항

작업원고와 수정내용이 일치하는가?	<input checked="" type="checkbox"/> 예
언어표시띠의 위치(누락여부)는 바른가?	<input checked="" type="checkbox"/> 예
약물(기호)이 깨지거나 위치가 어긋 난 곳은 없는가?	<input checked="" type="checkbox"/> 예
그림이 가려지거나 잘려나간 곳은 없는가?	<input checked="" type="checkbox"/> 예
바코드와 P/No.가 일치하는가? (바코드 확인)	<input checked="" type="checkbox"/> 예

*최종 확인후 본 체크리스트는 삭제됩니다.

INSTALLATION MANUAL

AHU COMMUNICATION KIT

Please read this installation manual completely before installing the product. Installation work must be performed in accordance with the national wiring standards by authorized personnel only.

Please retain this installation manual for future reference after reading it thoroughly.

PUDCA0



P/NO : MFL50024811

www.lg.com

TIPS FOR SAVING ENERGY

Here are some tips that will help you minimize the power consumption when you use the air conditioner. You can use your equipment more efficiently by referring to the instructions below:

- Do not cool excessively indoors. This may be harmful for your health and may consume more electricity.
- Block sunlight with blinds or curtains while you are operating the equipment.
- Keep doors or windows closed tightly while you are operating the equipment.
- Adjust the direction of the air flow vertically or horizontally to circulate indoor air.
- Speed up the fan to cool or warm indoor air quickly, in a short period of time.

For your records

Staple your receipt to this page in case you need it to prove the date of purchase or for warranty purposes. Write the model number and the serial number here:

Model number : _____

Serial number : _____

You can find them on a label on the side of each unit.

Dealer's name : _____

Date of purchase : _____

IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE.

Always comply with the following precautions to avoid dangerous situations and ensure peak performance of your product

WARNING

It can result in serious injury or death when the directions are ignored

CAUTION

It can result in minor injury or product damage when the directions are ignored

WARNING

- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Installation **MUST** conform with local building codes or, in the absence of local codes, with the Nation Electrical Code NFPA 70/ANSI C1-1003 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

Installation

- Always perform grounding.
 - Otherwise, it may cause electrical shock.
- Don't use a power cord, a plug or a loose socket that is damaged.
 - Otherwise, it may cause fire or electrical shock.
- For installation of the product, always contact the service center or a professional installation agency.
 - Otherwise, it may cause fire, electrical shock, explosion or injury.
- Securely attach the electrical part cover to AHU Comm. Kit.
 - If the electric part cover of AHU Comm. Kit is not attached securely, it could result in a fire or electric shock due to dust, water, etc.
- Always install an air leakage breaker and a dedicated switching board.
 - No installation may cause a fire and electrical shock.
- Do not keep or use flammable gases or combustibles near the equipment.
 - Otherwise, it may cause a fire or the failure of product.
- Do not install, remove or reinstall the unit by yourself.
 - Otherwise, it may cause a fire, electrical shock, explosion or injury.
- Do not disassemble or repair the product randomly.
 - It will cause a fire or electrical shock.
- Do not install the product in a place where there is the concern of falling down.
 - Otherwise, it may result in personal injury.
- Use caution when unpacking and installing.
 - Sharp edges may cause injury.

Operation

- Do not share the outlet with other appliances.
 - It will cause an electric shock or a fire due to heat generation.
- Do not use the damaged power cord.
 - Otherwise, it may cause a fire or electrical shock.
- Do not modify or extend the power cord randomly.
 - Otherwise, it may cause a fire or electrical shock.
- Take care so that the power cord may not be pulled during operation.
 - Otherwise, it may cause a fire or electrical shock.
- Unplug the unit if strange sounds, smell, or smoke comes from it.
 - Otherwise, it may cause electrical shock or a fire.
- Keep flames away.
 - Otherwise, may occur a fire.
- Take the power plug out if necessary, holding the head of the plug and do not touch it with wet hands.
 - Otherwise, it may cause a fire or electrical shock.
- Do not use the power cord near the heating tools.
 - Otherwise, it may cause a fire and electrical shock.
- Do not allow water to run into electrical parts.
 - Otherwise, it may cause the failure of machine or electrical shock.
- Hold the plug by the head when taking it out.
 - It may cause electric shock and damage.
- Be cautious that water could not enter the product.
 - Otherwise, it may cause a fire electrical shock or product damage.
- Do not step on the indoor/outdoor unit and do not put anything on it.
 - It may cause an injury through dropping of the unit or falling down.
- Do not place a heavy object on the power cord.
 - Otherwise, it may cause a fire or electrical shock.
- When the product is submerged into water, always contact the service center.
 - Otherwise, it may cause a fire or electrical shock.

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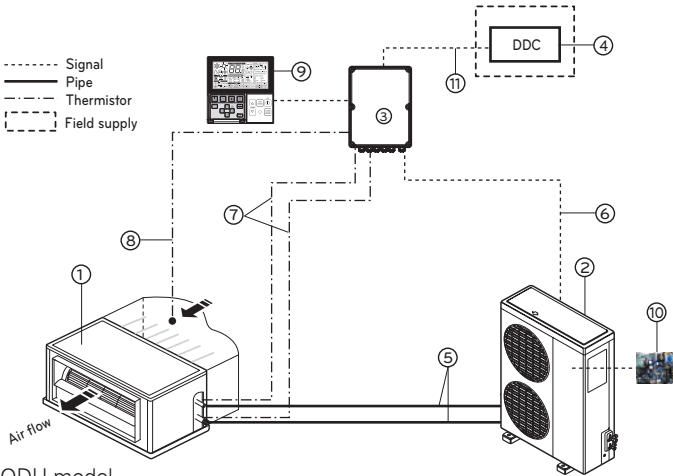
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INSTALLATION SCENE



* Applicable ODU model

Type	Model	Available
Standard	UU18W.UE4	All Produced from May.2015
	UU24W.U44	
	UU30W.U44	
	UU70W.U34	
	UU85W.U74	

! CAUTION

- Before installation of outdoor unit, check the serial Number, 1st digit indicates year, and 2nd/3rd digits mean month of production. For example, 503KCSFONT26 was produced on March 2015.

Parts and components

No.	Name	Remarks
1	AHU	Field supply
2	Outdoor Unit	Single CAC
3	AHU Communication Kit(PUDCA0)	-
4	DDC	Field supply(Central control Device)
5	Field piping	Field supply

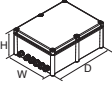



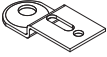

Wiring connections

6	Communication Kit Wiring	Power supply and communication between comm. kit and outdoor unit
7	Pipe thermistors	Evaporator (In/Out) control of AHU
8	Room thermistor	Return air control
9	Remote controller (PQRCVSL0/ PQRCVSLQW)	Optional accessory
10	PI485 (PMNFP14A0/PMNFP14A1)	Essential accessory
11	Signal	<ul style="list-style-type: none"> • Fan signal(Low / Middle / High) • Defrost / Heating / Cooling signal • Thermal On/Off

! CAUTION

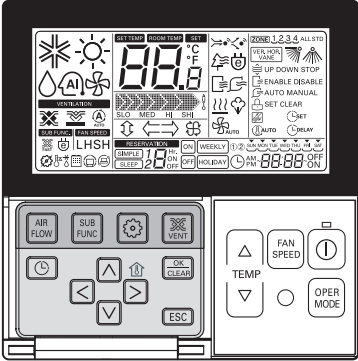
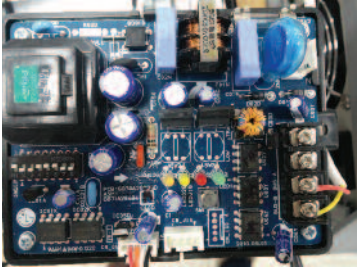
- For installation of Room thermistor (No. 8), always place it at the inlet of Heat Exchanger. Otherwise, it might not operate properly.

SUPPLIES

PUDCA0						
Components	AHU Comm. Kit	Room thermistor	Pipe thermistors	Installation Manual	Bracket	Option PCB
P/NO	AJT74975201	EBG61106821	EBG61287703(In) EBG61287704(Out)	MFL50024811	MAZ49398901	EBR65102902-04 EBR52358920 EBR52358921
Shape						
Quantity(EA)	1	1	2(Each 1)	1	4	5(Each 1)

Model Name	Weight (kg)		Dimension (mm)						POWER
	NET	Gross	NET			Gross			
			W	H	D	W	H	D	
PUDCA0	6.32	7.92	330	180	430	420	232	540	220-240 V~ 50 Hz 220 V~ 60 Hz 208/230 V~ 60 Hz

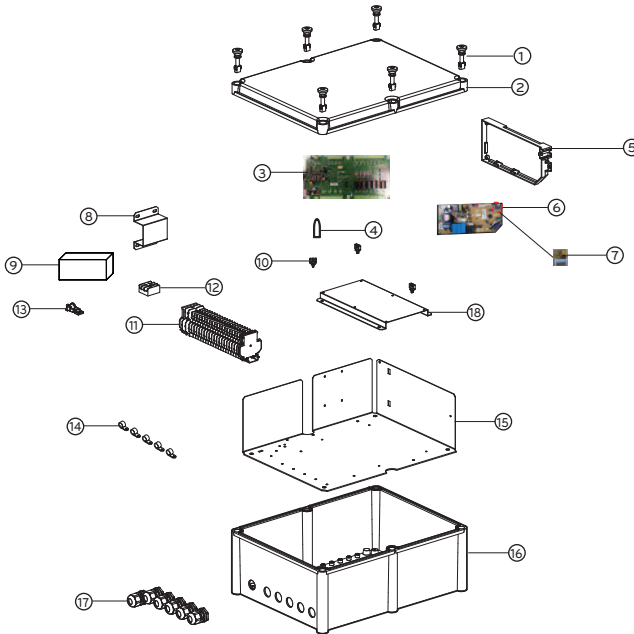
ACCESSORIES

Accessories		
Components	Remote controller	PI 485
Model name	PQRCVSL0 PQRCVSL0QW	PMNFP14A0 PMNFP14A1
Shape	 <p>(Optional accessory)</p>	 <p>(Essential accessory)</p>

* For further details of the accessories, refer to the manual provided at the time of purchasing the accessories.

PART DESCRIPTION

Communication Kit (PUDCA0)



No. m	Part Name	Quantity (EA)
1	Plastic (+) Bolt	6
2	Cover	1
3	Expansion I/O PCB	1
4	Supporter (Connect No. 3)	6
5	Main PCB case	1
6	Main PCB	1
7	Option PCB (24 kBtu/hr)	1
8	Bracket (For Adaptor)	1
9	AC/DC Converter	1
10	Supporter (Fixing Wiring)	7
11	Terminal Block (Communication)	1
12	Terminal Block (POWER Supply)	1
13	Clamp Cord (For Power Wiring)	1
14	Clamp Cord	5
15	Panel	1
16	Control Box Case	1
17	Cable gland	6
18	Bracket (For Expansion I/O PCB)	1

BEFORE INSTALLATION

⚠ CAUTION

- **Don't install or operate the unit in rooms mentioned below.**

- ① Where mineral oil, like cutting oil is present.
- ② Where the air contains high levels of salt such as air near the ocean.
- ③ Where sulphurous gas is present such as that in areas of hot spring.
- ④ In vehicles or vessels.
- ⑤ Where voltage fluctuates a lot such as that in factories.
- ⑥ Where high concentration of vapor spray are present.
- ⑦ Where machines generating electromagnetic waves are present.
- ⑧ Where acidic or alkaline vapor is present.
- ⑨ The option boxes must be installed with entrances downward.

- **Check the mentioned below, when you apply the AHU (Field supply).**

- ① If the AHU (Field supply) provided in the field is exclusively for heating, you must not change the operating mode to cooling on the remote controller. If not, it can cause electric shock, injury or death. If you want to operate in cooling mode, AHU (Field supply) must comply with the following details.
(Following)
 - The insulation level of AHU (Field supply) motor must be 'F' or above, and the protection level must satisfy 'IP 54'.
 - AHU (Field supply) must have the drain pan installed.
- ② Fan speed button on the wired remote controller (PQRCUSA0/1) is not operated.
- ③ For refrigerant piping of outdoor unit, refer to the installation manual supplied with the outdoor unit.
- ④ For installation of the wired remote controller (PQRCUSA0/1), refer to the manual supplied with the wired remote controller.
- ⑤ For protecting the refrigerant cycle in heating, the inlet Air temperature to the Heat Exchanger has to be over 5°C.
- ⑥ The EEV or TXV kit has to be installed on the AHU as close as possible to the Heat Exchanger.

- **AHU Communication Kit**

- ① Thermistor cable and remote controller wire should be located at least 50 mm away from power supply wires and from wires to the controller. Not following this guideline may result in malfunction due to electrical noise.
- ② Use only specified wires, and tightly connect wires to the terminals. Keep wiring in neat order so that it does not obstruct other equipment. Incomplete connections could result in overheating, and in worse case electric shock or fire.

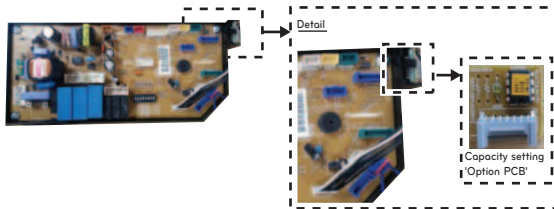
! CAUTION

Selection of Evaporator(AHU)

See table below for applicable units

Selecting the capacity setting 'Option PCB'(Accessory) according to the capacity mentioned below.

- The corresponding capacity setting 'Option PCB' needs to be selected depending on the need capacity.
- After checking the need capacity, remove the 24 k Option PCB equipped in the main PCB, and set up the Option PCB fitted the need capacity in the main PCB.



Option PCB P/NO	Capacity (Btu/h)	Standard heat exchanger volume ($10^{-3} \times \text{m}^3$)	Maximum heat exchanger capacity (kW)	Air Flow rate (CMM)
EBR65102902	18 k	2.4	5.0	13~16.5
EBR65102903	24 k	2.6	7.1	14~18
EBR65102904	30 k	2.9	8.0	20~26.5
EBR52358920	70 k	5.2	20.0	60~70
EBR52358921	85 k	5.9	23.0	64~80

* Evaporator Saturated Temperature(SST) = 6 °C, SH (Superheat) 5K, Air Temperature = 27 °C DBT / 19 °C WBT

* Heat exchanger volume [m^3] : Pipe cross-section \times Tube length

- Pipe cross-section [m^2] = $\pi \times \text{ID}^2 / 4$

- Tube length [m] = Tube length of 1 pipe \times Tube step \times Tube row

**CAUTION**

- AHU Operation range

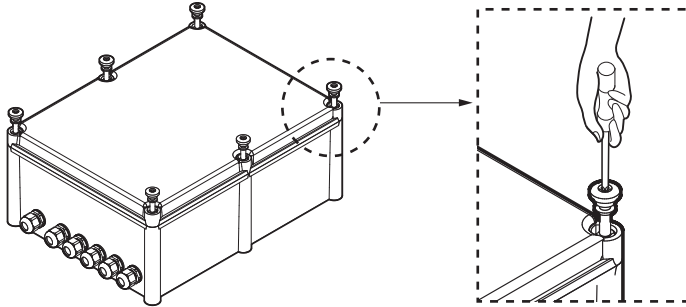
- When installing Room thermistor, always place it to the inlet of Heat Exchanger. Otherwise, it may not operate properly.
- Range of the inlet Air temperature to the Heat Exchanger is 18 ~ 40°C for cooling & 5 ~ 30°C for heating. If the temperature is under 18°C for cooling & over 30°C for heating, the system might operate ON and OFF because of protection logic system's.

No	Connection condition	Combination
1	100% Fresh Air Intake AHU only are connected with outdoor units	1) The total capacity of 100% Fresh Air Intake AHU should be 50~100% of outdoor unit.

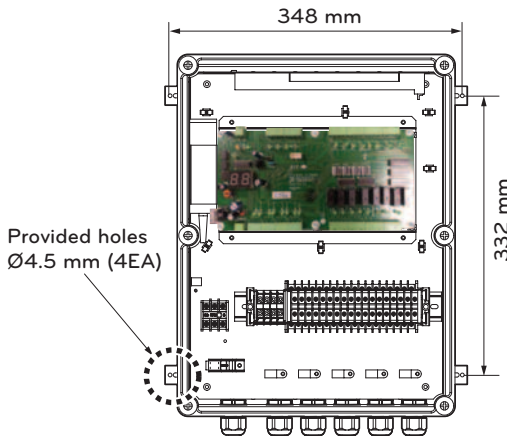
COMMUNICATION KIT INSTALLATION

Mechanical installation

- 1 Remove the Comm. Kit box cover by unscrewing the plastic bolt (6EA)



- 2 Drill 4 holes on correct position and fix the Comm. Kit box securely with 4 screws (Field supply) through the provided holes Ø4.5 mm (Reference the length of the holes Ø4.5)

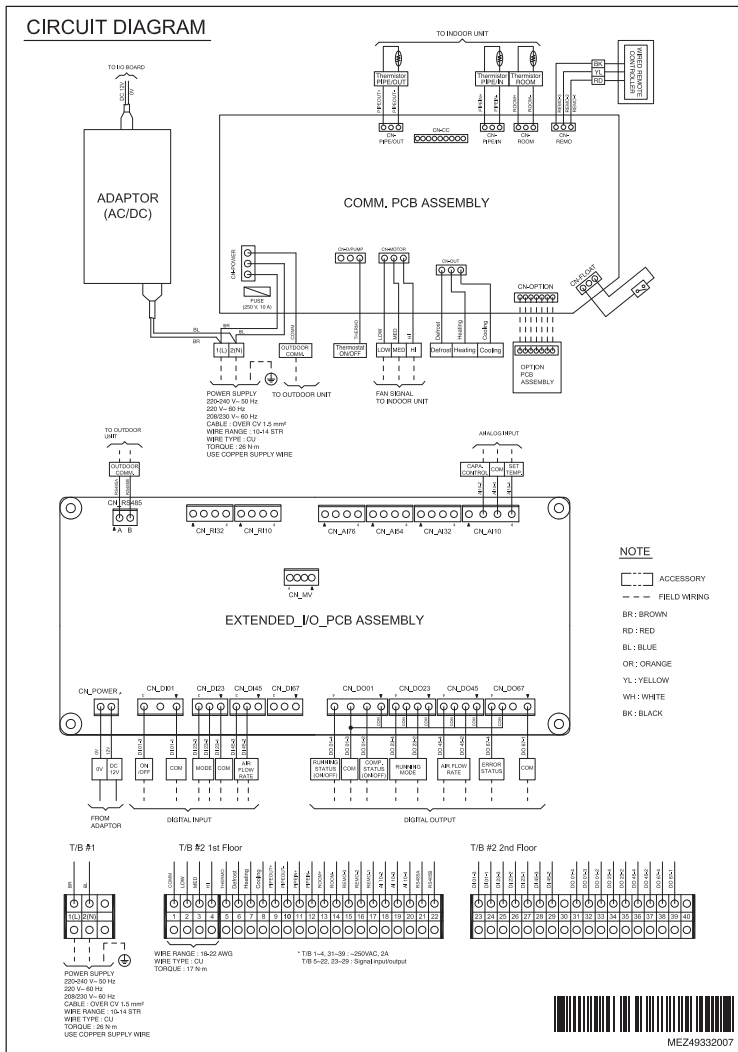


! WARNING

- Install where it can sufficiently support the weight of the comm.Kit.
If the support strength is not enough, the outdoor unit may drop and hurt people.
- Install where the comm.kit may not fall in strong wind or earthquake.
- If there is a fault in the supporting conditions, the comm.kit may fall and hurt people.
- It is installed at a place with a lot of snowfall, install with the place higher than the most extreme snowfall amount standard.

Electric Wiring Work

Circuit diagram

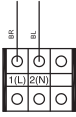


CAUTION

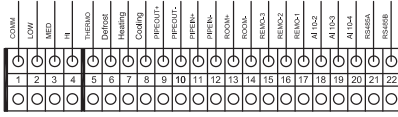
If you want to use Analogue Input signal for a variable capacity and a set temperature of room, you have to connect the wiring of AI 10-2, AI 10-3, AI 10-4.

Electric Wiring Work

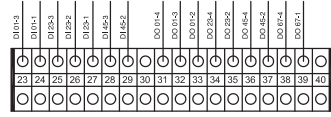
T/B #1



T/B #2 1st Floor



T/B #2 2nd Floor



Terminal Block No.	Connection	Function	Remark.
1(L) / 2(N)	Power Supply	220-240 V~ 50 Hz 220 V~ 60 Hz 208/230 V~ 60 Hz	-
1	To Outdoor Unit	Communication Line	-
2-4	To Indoor Unit (AHU)	Fan Signal	Low/Mid/High
3	DDC	Thermostat on/off Signal	-
6-8	DDC	Defrost, Heating, Cooling Signal	-
9-10	To Indoor Unit (AHU)	Pipe Out Thermistor	-
11-12		Pipe In Thermistor	-
13-14		Room Thermistor	-
15-17		Remote Controller	-
18	Analog Input	AI 10-2	Capacity Control
19		AI 10-3	Common Line
20		AI 10-4	Room Temperature Setting
21-22	To Outdoor Unit	RS485 Communication	-
23	Digital Input	DI 01-3	Operation ON/OFF
24		DI 01-1	Common Line
25		DI 23-3	Mode Change
26		DI 23-2	
27		DI 23-1	Common Line
28		DI 45-3	Air Flow Rate
29		DI 45-2	
31	Digital Output	DO 01-4	Running Status (ON/OFF)
32		DO 01-3	Common Line
33		DO 01-2	Comp. Status (ON/OFF)
34		DO 23-4	Running Mode
35		DO 23-2	
36		DO 45-4	Air Flow Rate
37		DO 45-2	
38		DO 67-4	
39		DO 67-1	Common Line

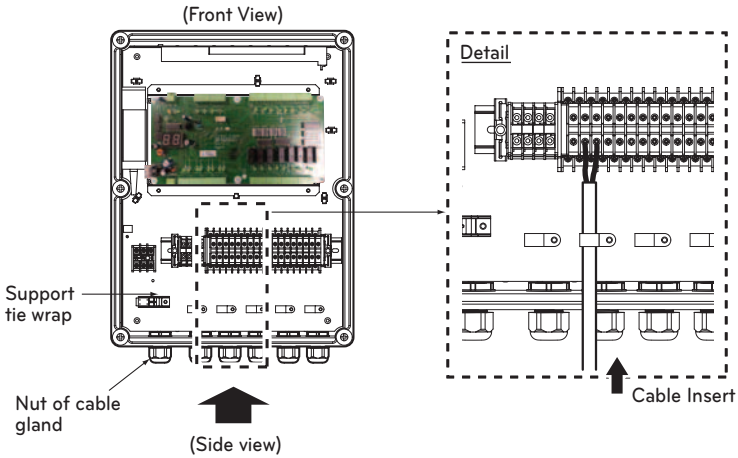
! CAUTION

If you want to use Analogue Input signal for a variable capacity and a set temperature of room, you have to connect the wiring of AI 10-2, AI 10-3, AI 10-4.

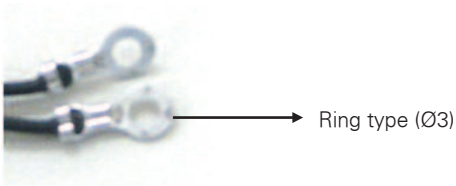
Electrical Work

Connection of the wires

- 1 For connection to outdoor unit and to controller (Field supply) :
Pull the wires inside through the cable gland and close the nut firmly in order to ensure a good pull relieve and water protection.
- 2 The wires require an additional pull-relief. Strap the wire with the support tie wrap.



- 3 For the wired remote controller wire and outdoor unit communication wire, remove the coating at the end of the wire to connect and use the ring type (Ø3) to connect to the terminal block.



Electric Wiring Work

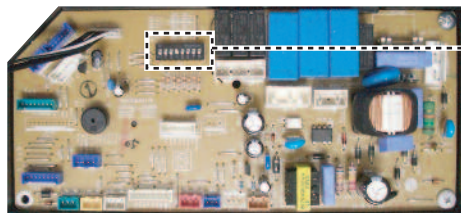
CAUTION

- All field supplied parts and materials and electric works must conform to local codes.
- Use copper wire only.
- All wiring must be performed by an authorized electrician.
- A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance to relevant local and national legislation.
- Refer to the installation manual attached to the outdoor unit for the size of power supply electric wire connected to the outdoor unit, the capacity of the circuit breaker and switch, wiring and wiring instructions.

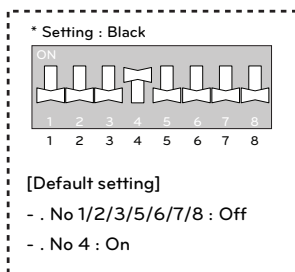
Controller Setting Method

Dip switch setting

If you want to run the Fan(L/M/H) in Heating Mode - defrosting condition, you should set the dip switch 4 to "On"(As shown below)



(Main PCB)

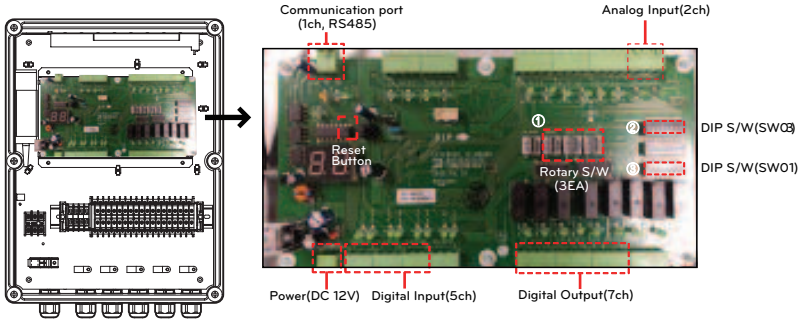


- PCB output signal(According to the dip switch 4 setting)

Condition		Output Signal			
		Thermal On/Off	Fan L/M/H	Defrost	Heating Mode
Dip switch Off	Off	Off	Off	Off	Off
	Cooling Mode	Off or On	On	Off	Off
	Fan Mode	Off	On	Off	Off
	Heating Mode	Off or On	Off or On	Off	On
	Heating Mode – Preheating	On	Off	Off	On
	Heating Mode – Defrosting	On	Off	On	On
	Auto Mode	The Same as Cooling or Heating Mode			
Dip switch On	Off	Off	Off	Off	Off
	Cooling Mode	Off or On	On	Off	Off
	Fan Mode	Off	On	Off	Off
	Heating Mode	Off or On	On	Off	On
	Heating Mode – Preheating	On	On	Off	On
	Heating Mode – Defrosting	On	On	On	On
	Auto Mode	The Same as Cooling or Heating Mode			

Controller Setting Method

Capacity controller

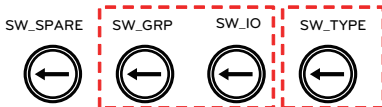


CAUTION

- DI requires non-voltage contact
- DO provides relay output (max : 250Vac 1A)
- AI : 0Vdc ~ 10Vdc
- RS485 port : Connect to INTERNET A/B on ODU's main PCB

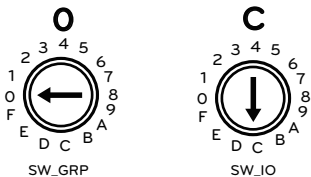
- 1 Analog Input : Control the supply air temperature and Comp. capacity of Single CAC.
- 2 Digital Input : Acquires the control value of AHU operation from DDC (Field supply).
- 3 Digital Output : Send the condition value of AHU operation to DDC (Field supply).
- 4 RS485 : Sends the On/Off signal taking from DDC to the indoor & outdoor unit and send the condition value taking from indoor & outdoor unit to DDC with On/Off Output.

① Rotary S/W



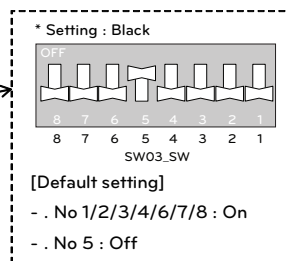
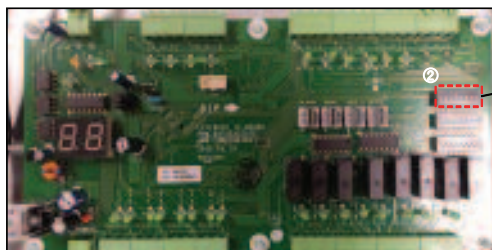
This S/W is for setting up the address of AHU Comm. Kit (00 ~ FF).
 Example) AHU Comm. Kit address is '0C' .

This S/W is for setting up the temperature from AHU Comm. Kit.



Detail information refer to the ④ Room Temperature control from DDC or Rotary S/W

② Dip S/W(SW03)

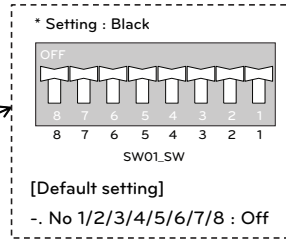
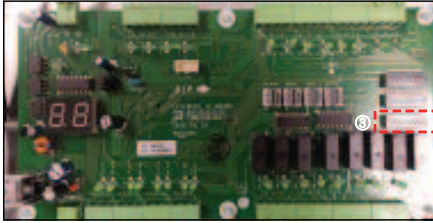


S/W name	No	Item	On	Off	Note
SW03_SW	1	RS485/IDU	RS485	Not available	- . RS485 : Connect to INTERNET A/B on ODU unit
	2	Master/Slave	Master	Slave	- . Master is default for single unit installation - . Master is only one among multiple unit
	3	Control enable / disable	DI/DO enable	DO only enable	- . Enable : DI/DO are enable - . Disable : DO only are enable
	4	Room Temperature setting 1	AI	Rot.S/W	- . AI : Input as analog input (Controlled through DDC) - . Rot. S/W : manual setting
	5	Air flow rate	High/Low	High/Mid/Low	- . On : Mid step is not available. (Mid step is displayed as current step)
	6	Room Temperature setting 2	Default	AI / Rot. S/W	Room Temperature Default setting - . On : Default(Cooling 18°C, Heating 30°C) - . Off : Room air(or return air) temperature control using AI Signal and Rotary S/W (Refer to the DIP S/W No.4)
	7	Not available	-	-	-
	8	Flash Writing	Normal	On-boarding	- . Default : On

CAUTION

When the Dip S/W No. 6 is On, capacity control is possible and the value of Analogue input signal for temperature control, Rotary S/W and Remote controller is ignored. In case of setting the temperature of room using Analogue input signal, Rotary S/W and Remote controller, Dip S/W No. 6 have to be Off certainly.

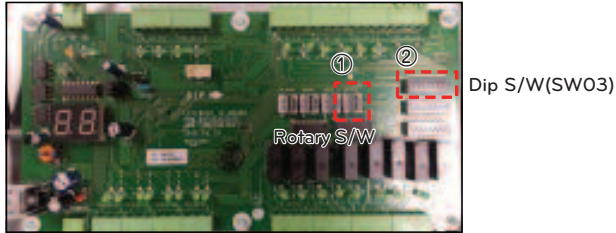
③ Dip SW(SW01)



S/W name	No	Item	Setting Dip S/W			AI Function
			1	2	3	
SW01 _SW	1 ~3	ODU Capacity Option Setting	Off	Off	Off	Option #1
			On	Off	Off	Option #2
			Off	On	Off	Option #3
	4~8	Not available	-	-	-	-

④ Room Temperature control from DDC or Rotary S/W

* According to Dip S/W(SW03) Setting, you can set up the Function of Room Temperature control.



		Dip S/W(② SW03)	Function
Setting Dip S/W	No 1	ON	RS485 Communication with Single CAC
		OFF	Not available
	No 3	ON	Possible to control Room Temperature Function (Default)
		OFF	Only Monitoring (DO Signal only is enable)
	No 4	ON	DDC Control (Wiring No. AI 10-4)
		OFF	Rotary S/W(SW_TYPE) Control
No 6	ON	Room Temperature Default setting (Cooling 18°C, Heating 30°C)	
	OFF	Room Air(or return air) temperature control using AI signal and Rotary S/W	

- Dip S/W(SW03) NO 4 : OFF

Rotary S/W(①) Number	Room Temp.(°C) Cooling	Room Temp.(°C) Heating
0	Not available	Not available
1	18	16
2	18	17
3	18	18
4	19	19
5	20	20
6	21	21
7	22	22
8	23	23
9	24	24
A	25	25
B	26	26
C	27	27
D	28	28
E	29	29
F	30	30

- Dip S/W(SW03) NO 4 : ON

Analog Input 10-4 (VDC)			Room Temp.(°C) Cooling	Room Temp.(°C) Heating
Normal	Range			
	Min.	Max.		
0.5	0	1.15	Not available	Not available
1.5	1.35	1.65	18	16
2	1.85	2.15	18	17
2.5	2.35	2.65	18	18
3	2.85	3.15	19	19
3.5	3.35	3.65	20	20
4	3.85	4.15	21	21
4.5	4.35	4.65	22	22
5	4.85	5.15	23	23
5.5	5.35	5.65	24	24
6	5.85	6.15	25	25
6.5	6.35	6.65	26	26
7	6.85	7.15	27	27
7.5	7.35	7.65	28	28
8	7.85	8.15	29	29
8.5	8.35	8.65	30	30
9.5	8.85	10	Not available	Not available

Example) 5.85~6.15 Voltage is recognized as 6.0V.

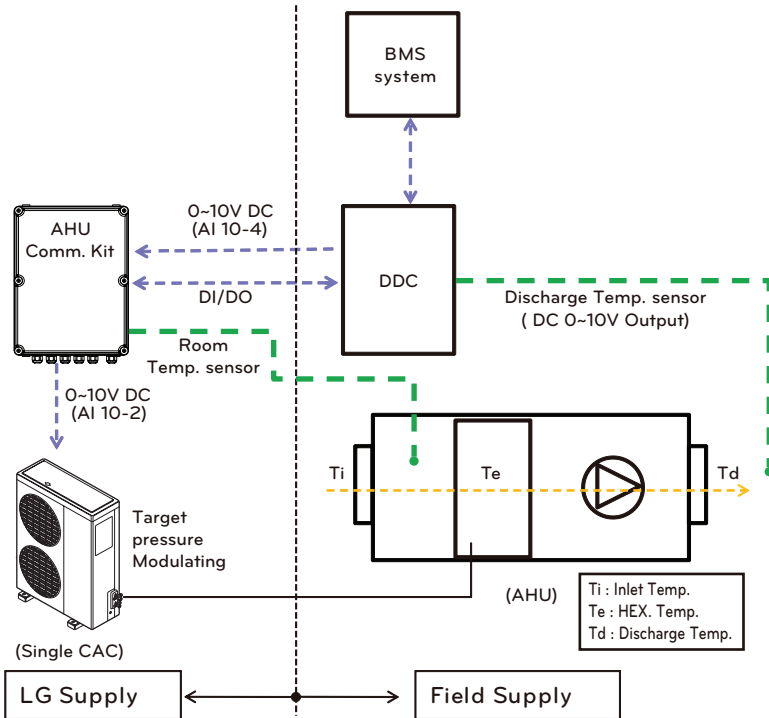


CAUTION

If you want to control the Room Temperature using Remote controller, you have to be off the Dip S/W 4 and Dip S/W 6, and setting the Rotary S/W to the '0'.

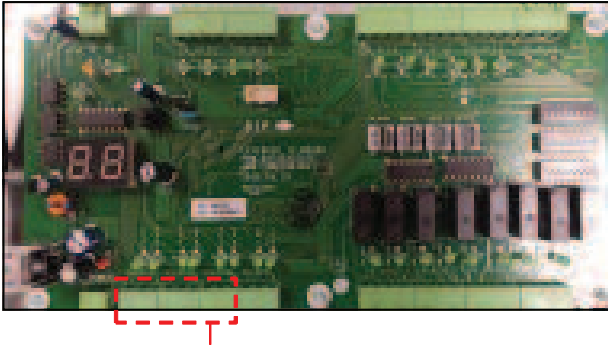
AHU KIT WIRING CONFIGURATION WITH DDC

Configuration concept



- 1 Comm. Kit control capacity of the cooling/heating only according to the DDC's control signal (DC 0~10V)
- 2 Control signal from the DDC is decided by calculation logic with Td/Ti and setting temperature (Calculation logic depends on BMS program).
- 3 For Installation of Room thermistor, recommended to be installed to the inlet of Heat Exchanger.

DI Wring concept



Digital Input(5ch)

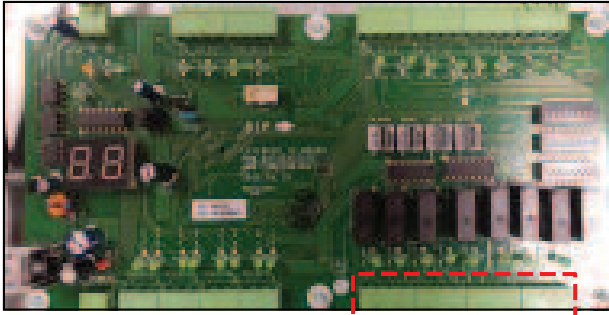
DI Specification
: Non-Voltage Contact

Wiring No.	Input		Logic	Conditions
	Open	Short		
DI 01-3	Operation Off	Operation On	<ul style="list-style-type: none"> - When short, the fan signal (FAN) is On and ODU will start to run. - When open, ODU will off and FAN changes to Off. 	<ul style="list-style-type: none"> - Operation mode : DI 23-3/23-2 - Fan mode : DI 45-3/45-2
DI 23-3	FAN Operation	Cooling or Heating	<ul style="list-style-type: none"> - When open, FAN is On but ODU will not run. - When short, FAN is On and mode is decided DI 23-2. - If no more cooling and heating is necessary, DI 23-3 is open and DI 01-3 is On. 	<ul style="list-style-type: none"> - DI 01-3 : short
DI 23-2	Cooling Operation	Heating Operation	<ul style="list-style-type: none"> - When open, mode is cooling - When short, mode is heating 	<ul style="list-style-type: none"> - DI 01-3 : short - DI 23-3 : short
DI 45-3	Low FAN	Mid FAN	<ul style="list-style-type: none"> - When DI 45-3/45-2 are open : Low fan mode and FAN is On. - When DI 45-3 is short : Mid fan and FAN is On. 	<ul style="list-style-type: none"> - DI 01-3 : short - Operation mode : DI 23-3/23-2
DI 45-2		High FAN	<ul style="list-style-type: none"> - When DI 45-2 short : High fan and FAN is On. - When DI 01-3 is open : FAN is Off, DI 45-3,/45-2 are neglected. 	

! NOTE

Fan signal (FAN) can be delayed on heating mode start up despite of fan mode (DI 45-3/45-2) because fan signal (FAN) will be On , if temperature of refrigerant pipe sensors (PIPE_IN, PIPE_Out) are higher than 20°C to prevent cold air discharge.

DO Wring concept



Digital Output(7ch)

DO Specification
: AC 250V, DC 30V, 1A

Wiring No.	Output		Logic
	Open	Short	
DO 01-4	Operation On	Operation Off	<ul style="list-style-type: none"> - When DI 01-3 is short, ODU and FAN are On. - When DI 01-3 is open, ODU and FAN are Off.
DO 01-2	Compressor is Off	Compressor is On	<ul style="list-style-type: none"> - When ODU compressor is running, it is short. - When ODU compressor is off, it is open
DO 23-4	Cooling / Heating Defrosting / FAN		<ul style="list-style-type: none"> - When DO 23-4 / 23-2 are open, it is ventilation mode. - When DO 23-4 is open, DO 23-2 is short, it is defrosting during heating. FAN can be OFF if PIPE_IN and PIPE_OUT are less than 20°C.
DO 23-2			<ul style="list-style-type: none"> - When DO 23-4 is short, DO 23-2 is open, it is cooling. - When DO 23-4 is short, DO 23-2 is short, it is heating - Defrosting mode only works when it is connected with ODU.
DO 45-4	Low FAN	Mid FAN	<ul style="list-style-type: none"> - When DO 45-4 / DO 45-2 are open, it is low fan mode. - When DO 45-4 is short and DO 45-2 is open , it is mid fan mode.
DO 45-2		High FAN	<ul style="list-style-type: none"> - When DO 45-2 is short, it is high fan mode (DO 45-4 is neglected).
DO 67-4	No Error	Error Occurred	<ul style="list-style-type: none"> - When DO 67-4 is short, ODU has error and ODU stops FAN is Off.

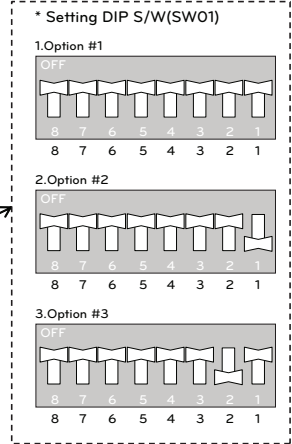
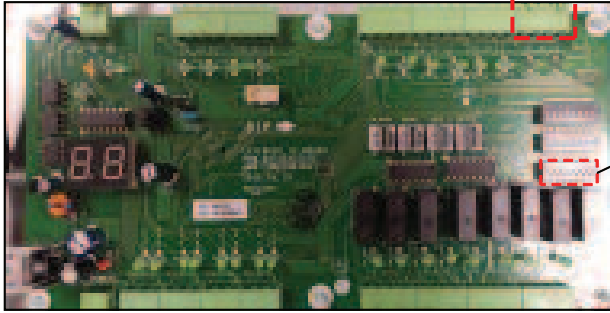
NOTE

If AHU should have High/Mid/Low fan mode, Fan control in AHU should utilize DO 45-4 /45-2 (Non-Voltage Contact).

AI Wring concept

AI Specification : DC 0~10V

Analog Input(2ch)



Discharge Temperature Control through controlling of ODU capacity

1. Option #1

AI No.	Input voltage [Vdc]	Low [Vdc]	High [Vdc]	Capacity of unit [%]	Cooling		Heating		Control
					Target Low Pressure [kPa]	Temperature at HEX [°C]	Target High Pressure [kPa]	Temperature at HEX [°C]	
AI 10-2	0	0	0.4	No limit	-	-	-	-	DI should be decided.
	1	0.6	1.4	100	866	12.7	2 794	47.6	DI will determine fan mode and operation mode.
	2	1.6	2.4	90	931	14.8	2 500	43.1	
	3	2.6	3.4	80	997	16.9	2 337	40.4	
	4	3.6	4.4	70	1 062	18.9	2 141	36.9	
	5	4.6	5.4	60	1 127	19.8	1 977	33.9	
	6	5.6	6.4	50	1 193	22.6	1 814	30.7	
	7	6.6	7.4	45	1 225	23.5	1 748	29.3	
	8	7.6	8.4	40	1 258	24.4	1 683	27.9	
	9	8.6	9.4	Comp. off	-	-	-	-	If it is 9V, DO 01-4 is short, DO 01-2 is open.
10	9.6	10	All off	-	-	-	-	ODU and fan are Off.	

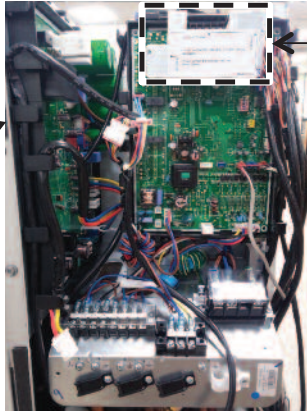
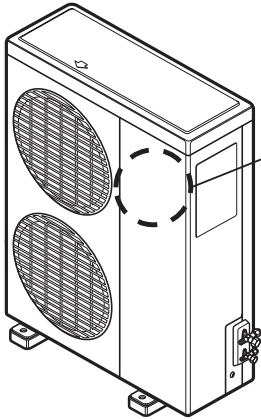
2. Option #2

AI No.	Input voltage [Vdc]	Low [Vdc]	High [Vdc]	Capacity of unit [%]	Cooling		Heating		Control
					Target Low Pressure [kPa]	Temperature at HEX [°C]	Target High Pressure [kPa]	Temperature at HEX [°C]	
AI 10-2	0	0	0.4	Comp. off	-	-	-	-	DO 01-4 is short, DO 01-2 is open.
	1	0.6	1.4	40	1 258	24.4	1 683	27.9	DI will determine fan mode and operation mode
	2	1.6	2.4	45	1 225	23.5	1 748	29.3	
	3	2.6	3.4	50	1 193	22.6	1 814	30.7	
	4	3.6	4.4	60	1 127	19.8	1 977	33.9	
	5	4.6	5.4	70	1 062	18.9	2 141	36.9	
	6	5.6	6.4	80	997	16.9	2 337	40.4	
	7	6.6	7.4	90	931	14.8	2 500	43.1	
	8	7.6	8.4	100	866	12.7	2 794	47.6	
	9	8.6	9.4	100	866	12.7	2 794	47.6	
10	9.6	10	100	866	12.7	2 794	47.6		

3. Option #3

AI No.	Input voltage [Vdc]	Low [Vdc]	High [Vdc]	Capacity of unit [%]	Cooling		Heating		Control
					Target Low Pressure [kPa]	Temperature at HEX [°C]	Target High Pressure [kPa]	Temperature at HEX [°C]	
AI 10-2	0	0	0.4	Comp. off	-	-	-	-	DO 01-4 is short, DO 01-2 is open.
	1	0.6	1.4	Comp. off	-	-	-	-	DI will determine fan mode and operation mode
	2	1.6	2.4	40	1 258	24.4	1 683	27.9	
	3	2.6	3.4	45	1 225	23.5	1 748	29.3	
	4	3.6	4.4	50	1 193	22.6	1 814	30.7	
	5	4.6	5.4	60	1 127	19.8	1 977	33.9	
	6	5.6	6.4	70	1 062	18.9	2 141	36.9	
	7	6.6	7.4	80	997	16.9	2 337	40.4	
	8	7.6	8.4	90	931	14.8	2 500	43.1	
	9	8.6	9.4	100	866	12.7	2 794	47.6	
10	9.6	10	100	866	12.7	2 794	47.6		

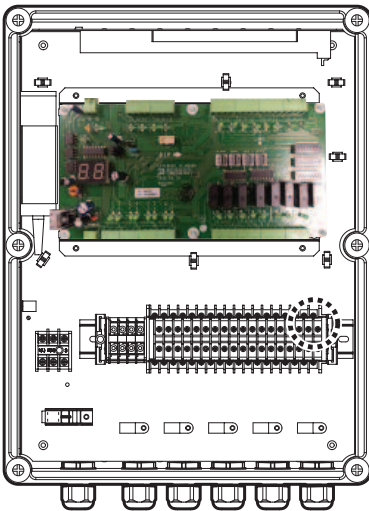
PI 485 connection_essential accessory



PI 485 installation location

* Applicable PI 485 model
- PMNFP14A0/
PMNFP14A1

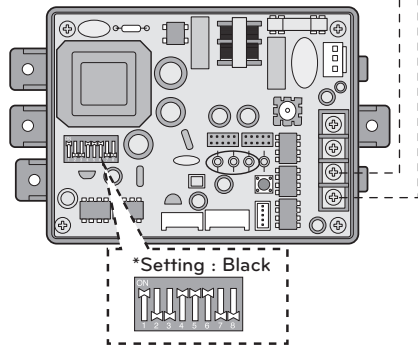
- Using screw, fix the PI 485 on the bracket of outdoor unit control box
For more information, please refer to Outdoor Unit installation manual.



----- Signal

T/B #2 1st Floor

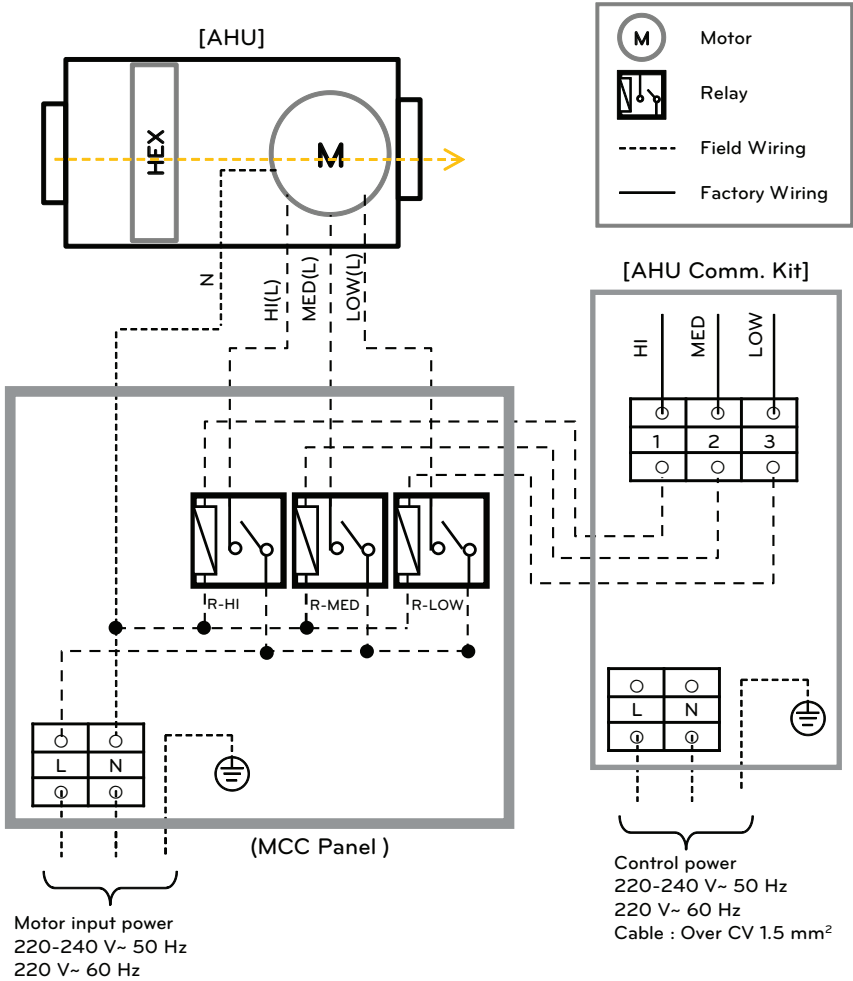
DOWN	LOW	MED	HI	INTERM	Disturb	Heating	Cooling	PRECOOL	PRECOOL	PREHEAT	ROOM	ROOM	ROOM	REHEAT	REHEAT	ATTIC2	ATTIC3	ATTIC4	REHEAT	REHEAT	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



*Setting : Black

- Using cable, connect the PI 485 to main PCB.
For more information, please refer to PI 485 installation manual.

FAN Signal Wiring Concept



CAUTION

- If the motor is On/Off type, HI/MED/LOW wire have to connect as common. For example, If you just connect HI wire to the motor(On/Off), motor is not operating according to our control logic.
- High, Middle, Low wire from AHU Comm. Kit should not be connected directly to the motor. Always use it as a motor for driving the relay contacts. Otherwise there is a risk of damage to product or a fire.

THERMISTORS INSTALLATION

Pipe thermistors Installation

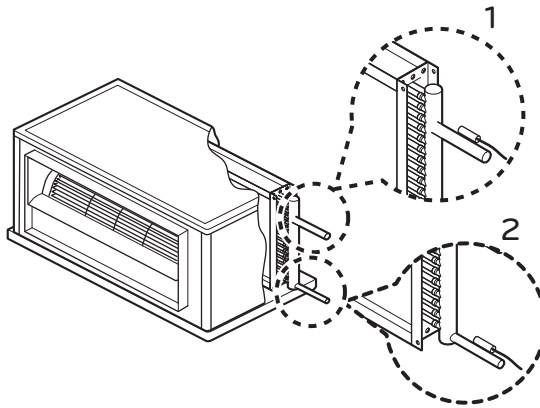
Location of the pipe thermistors

A correct installation of the thermistors is required to ensure a good operation :

- 1 Pipe_In(EBG61287703)
: Install the thermistor behind the distributor on the coldest pass the heat exchanger (contact your heat exchanger dealer).
- 2 Pipe_Out(EBG61287704)
: Install the thermistor at the outlet of the heat exchanger as close as possible to the heat exchanger.

Evaluation must be done to check if the evaporator is protected against freeze-up.
Execute test operation and check for freeze-up.

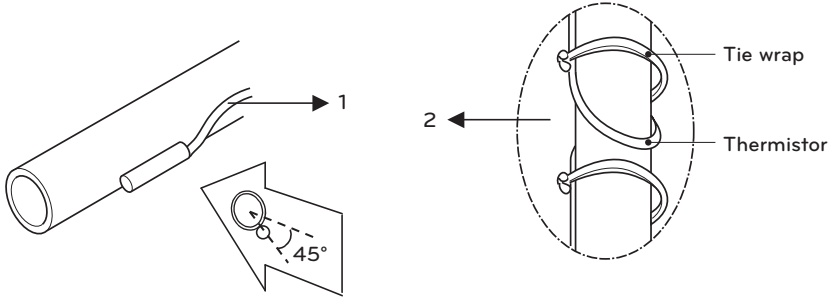
- 1 Pipe_In(Suction pipe)
- 2 Pipe_Out(Discharge pipe)



(AHU)

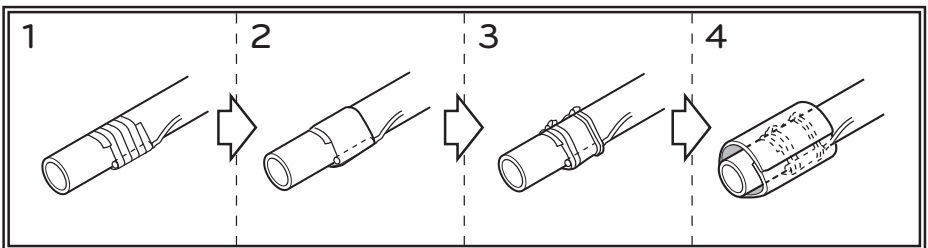
Installation of the pipe thermistor cable

- 1 Put the thermistor cable in a separate protective tube.
- 2 Always add a pull-relief to the thermistor cable to avoid strain on the thermistor cable and loosening of the thermistor. Strain on the thermistor cable or loosening of the thermistor may result in bad contact and incorrect temperature measurement.



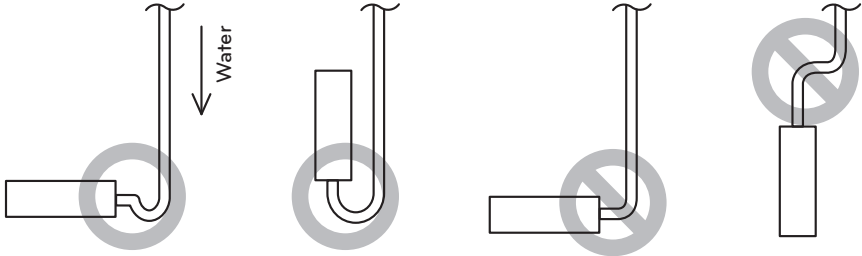
Fixation of the pipe thermistors (Field work)

- 1 Fix the thermistor with insulating aluminum tape (Field supply) in order to ensure a good heat transfer.
- 2 Put the supplied piece of rubber around the thermistor (EBG61287703/04) in order to avoid loosening of the thermistor after some years.
- 3 Fasten the thermistor with 2 tie wraps (Field Supply)
- 4 Insulate the thermistor with insulation sheet (Over 5t, Field Supply)

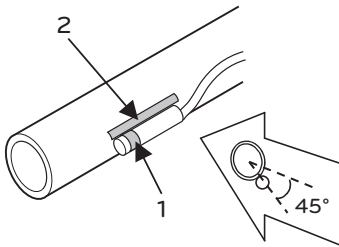


! INSTRUCTION

- Put the thermistor wire slightly top to above water accumulation on down of the thermistor.



- For sensing the evaporator's temp. in thermistor, Put the upper port the thermistors on the evaporator, this is the most sensitive point of the thermistor.



- 1 Most sensitive point of the thermistor
- 2 Maximize the contact

TROUBLESHOOTING

Problem	Cause	Remedy
AHU Communication Kit does not work	No power supply	Check the electrical connection and voltage of the power supply.
	Wiring is wrong	Check the electrical connection of the Communication Kit (Refer to the circuit diagram of the Communication Kit)
	AHU Communication Kit is broken	Check the electrical and mechanical part.

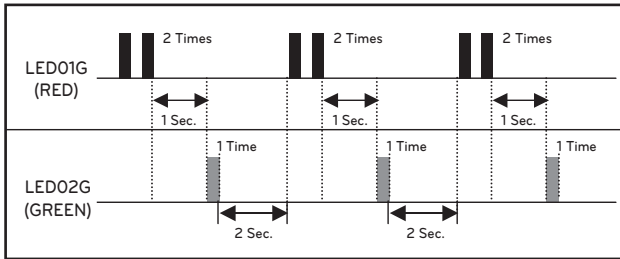
Error Indicator

- This function indicates types of failure in self-diagnosis and occurrence of failure for air condition.
- Error mark is displayed on 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 Code (Comm.Kit)]

Display Number		Error Item	Cause of Error
CH	01	Room Temperature	Temperature sensor disconnection or short circuit on Room or RA of AHU
CH	02	Pipe In Temperature sensor error	Temperature sensor disconnection or short circuit on pipe inlet of AHU
CH	03	Communication error between wired remote controller and Comm. Kit	No communication signal for more than 3 minutes from wired remote controller to the Comm. Kit
CH	05	Communication error between Comm. Kit and Outdoor Unit	No communication signal for 5 minutes continuously from Comm. Kit to Outdoor Unit
CH	06	Pipe Out Temperature sensor error	Temperature sensor disconnection or short circuit on pipe outlet of AHU
CH	09	Option PCB EEPROM error	No reading signal for 5 times continuously from EEPROM to Comm. Kit

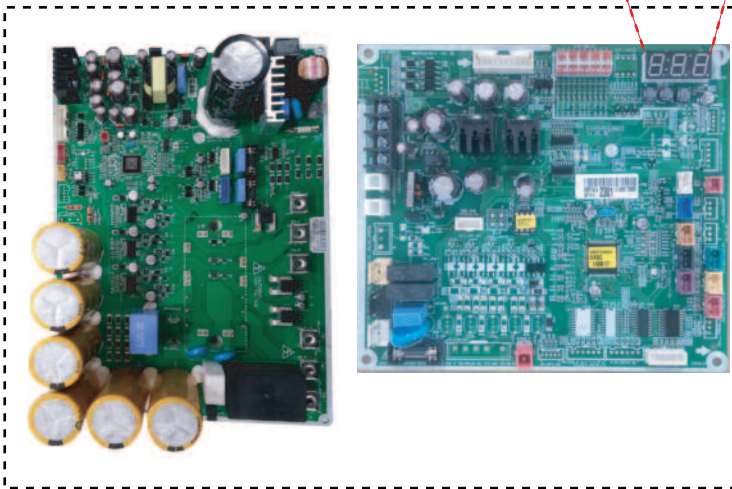
[Error Code (Outdoor Unit)]



Outdoor Error

Ex) CH21 (IGBTM Fault Error)

7 Segment



! CAUTION

- This page is about outdoor error code. It can vary depending on outdoor unit. For more information, please refer to the outdoor unit manual.

- Error checking : The errors may be checked on LED of the display parts of wired remote controller and the LED of the controller of outdoor device.

Code	Contents	Operation State	Error Display		
			Cable Remote Controller	Outdoor Device	
				Red LED	Green LED
21	IGBTM Fault Error	Stop	CH21	Flashing 2 times	Flashing 1 time
22	CT 2 Error (Input of Over-Current)	Stop	CH22	Flashing 2 times	Flashing 2 times
23	DC Link Error (High/Low DC Voltage)	Stop	CH23	Flashing 2 times	Flashing 3 times
25	Outdoor Unit Input Voltage High/Low Voltage	Stop	CH25	Flashing 2 times	Flashing 5 times
26	DC Comp Position Detection Error	Stop	CH26	Flashing 2 times	Flashing 6 times
27	PSC/PFC Over-Current Error (HW)	Stop	CH27	Flashing 2 times	Flashing 7 times
29	Comp Phase Over-Current Error	Stop	CH29	Flashing 2 times	Flashing 9 times
32	D-Pipe Overheating Error (INV Comp)	Stop	CH32	Flashing 3 times	Flashing 2 times
40	Outdoor Unit Inverter Compressor CT Sensor Fault	Stop	CH40	Flashing 4 times	-
41	D-Pipe Sensor Error (INV Comp)	Stop	CH41	Flashing 4 times	Flashing 1 time
43	High pressure Sensor Error	Stop	CH43	Flashing 4 times	Flashing 3 time
44	Outdoor Inlet Sensor Error	Stop	CH44	Flashing 4 times	Flashing 4 times
45	Cond. Pipe Sensor Error	Stop	CH45	Flashing 4 times	Flashing 5 times
46	Suction Pipe Sensor Error	Stop	CH46	Flashing 4 times	Flashing 6 times
48	Cond. Out-Pipe Sensor Error	Stop	CH48	Flashing 4 times	Flashing 8 times
51	Over-Capacity Connection Error	Stop	CH51	Flashing 5 times	Flashing 1 time
53	Communication Error between Outdoor Device ↔ Indoor Device	Stop	CH53	Flashing 5 times	Flashing 3 times
54	Open and Reverse Phase Error	Stop	CH54	Flashing 5 times	Flashing 4 times
60	EEPROM Check Sum Error	Stop	CH60	Flashing 6 times	-
61	Outdoor Device Pipe Overheating Error	Stop	CH61	Flashing 6 times	Flashing 1 time
62	Heat-sink Overheating Error	Stop	CH62	Flashing 6 times	Flashing 2 times
65	Heat-sink Sensor Error	Stop	CH65	Flashing 6 times	Flashing 5 times
67	Outdoor BLDC Fan Lock Error	Stop	CH67	Flashing 6 times	Flashing 7 times
71	Converter CT Sensor Error of Outdoor Unit	Stop	CH71	Flashing 7 times	Flashing 1 time
73	PSC/PFC Over-Current Error (SW)	Stop	CH73	Flashing 7 times	Flashing 3 times



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