AHU Kit

A solution to connect LG's high efficiency system to the DX coil of an air handling unit for maximum energy savings.

COMMUNICATION KIT

PAHCMR000

PAHCMS000

CONTROL KIT
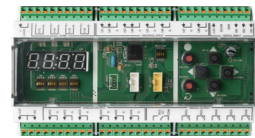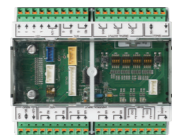
PAHCNM000

EEV KIT

PRLK048A0
PRLK096A0

PRLK396A0

PRLK594A0

CONTROLLER MODULE

PAHCMM000

PAHCMC000

Specification

Control Application Kit

TYPE	MODEL	DIMENSIONS (MM)			POWER SUPPLY	IP RATING	DESCRIPTION
		W	H	D			
Communication Kit	PAHCMR000	300	300	155	1Ø, 220 ~ 240 V, 50 / 60 Hz	IP66	Return / Room air temperature control by DDC or LG individual / centralized controller.
	PAHCMS000	380	300	155	1Ø, 220 ~ 240 V, 50 / 60 Hz	IP66	Discharge air / Supply air temperature control by DDC or LG individual / centralized controller
Controller Module	PAHCMM000	162	90	61	DC 12V	IP20	Main Controller module
	PAHCMC000	108	90	61	DC 12V	IP20	Communication Controller module
Control Kit	PAHCNM000	500	500	210	1Ø, 220 ~ 240 V, 50 / 60 Hz		Various AHU control functions with multiple DX coils (Maximum connectable ODU is 3 units)

Expansion Application Kit

| TYPE	MODEL	DIMENSIONS (MM)			PIPE DIAMETER (MM)	CAPACITY INDEX RANGE
		W	H	D	LIQUID	
EEV Kit	PRLK048A0	217	404	83	12.7	3.6 ~ 28 kW
	PRLK096A0	217	404	83	12.7	28.1 ~ 56 kW
	PRLK396A0	349.5	345.5	180	19.05	56.1 ~ 112 kW
	PRLK594A0	409.5	345.5	180	19.05	112.1 ~ 168 kW

Communication Kit

High Energy Efficiency

LG's DX AHU solutions' superior performance provides a highly efficient heat source system.
• High energy efficiency inverter system
• Large range of expansion application Kit : Max. 168 kW EEV Kit 1)
• Connected to various heat sources : MULTI V, MULTI V WATER, MULTI V S, SINGLE SPLIT

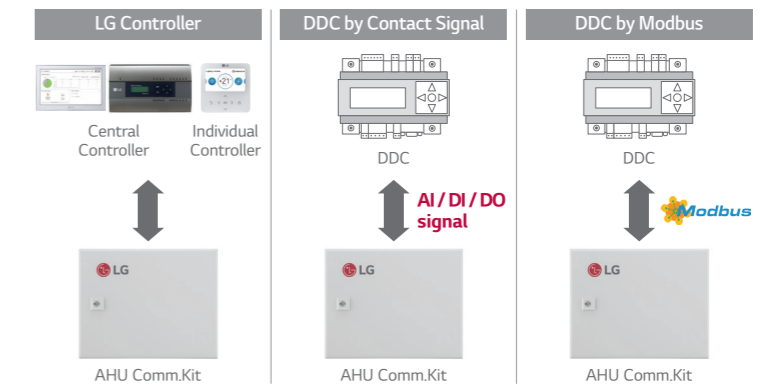1) Maximum connectable EEV capacity for PAHCMR000, PAHCMC000 is 112 kW.

AHU

MULTI V *i*
MULTI V 5

MULTI V WATER 5   MULTI V S   SINGLE SPLIT
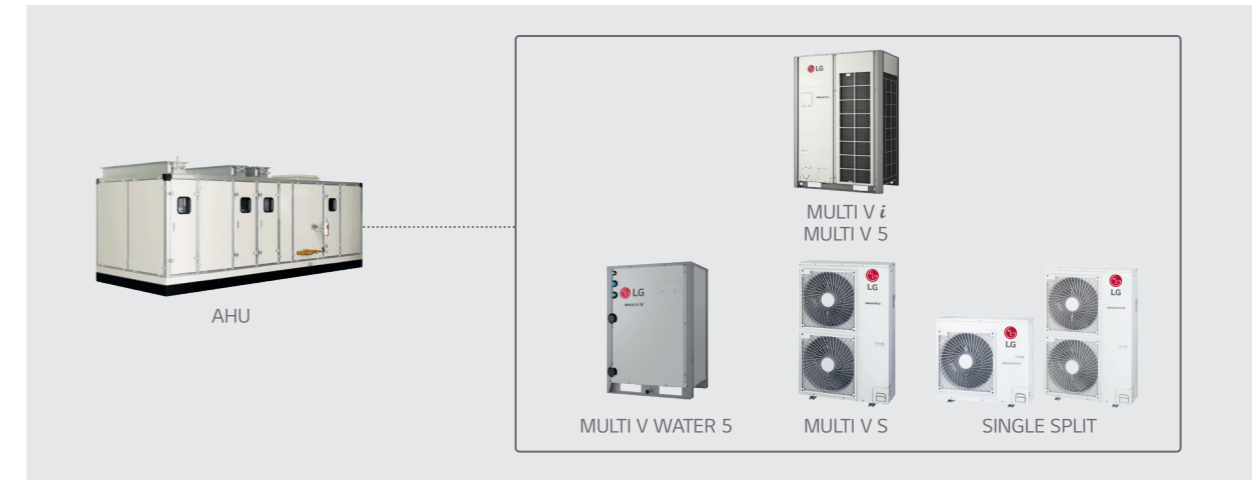
Diverse Options for Control

AHU communication kit can be connected to various control systems such as LG individual / central controller and DDC.[1]
It can be directly connected to DDC without separated controller, so DDC can receive product control and monitor information through contact signal or Modbus protocol.

• LG Individual / Central controller supported
  - LG controller stand alone or combination with DDC
• Direct wiring between DDC and
  AHU communication kit
  - Embedded Digital I / O and Analog Input
  - Modbus RTU protocol supported

1) DDC : Direct Digital Controller

| LG Controller	DDC by Contact Signal	DDC by Modbus
Central Controller / Individual Controller	DDC	DDC
	AI / DI / DO signal	Modbus
AHU Comm.Kit	AHU Comm.Kit	AHU Comm.Kit

AHU Kit

Communication Kit

Expandable System Design

LG AHU system can be a suitable solution for various sites due to its application flexibility and wide range of line up with large capacity models.
According to the required capacity, a single or multiple module combination is possible due to the AHU communication kit's modular design.
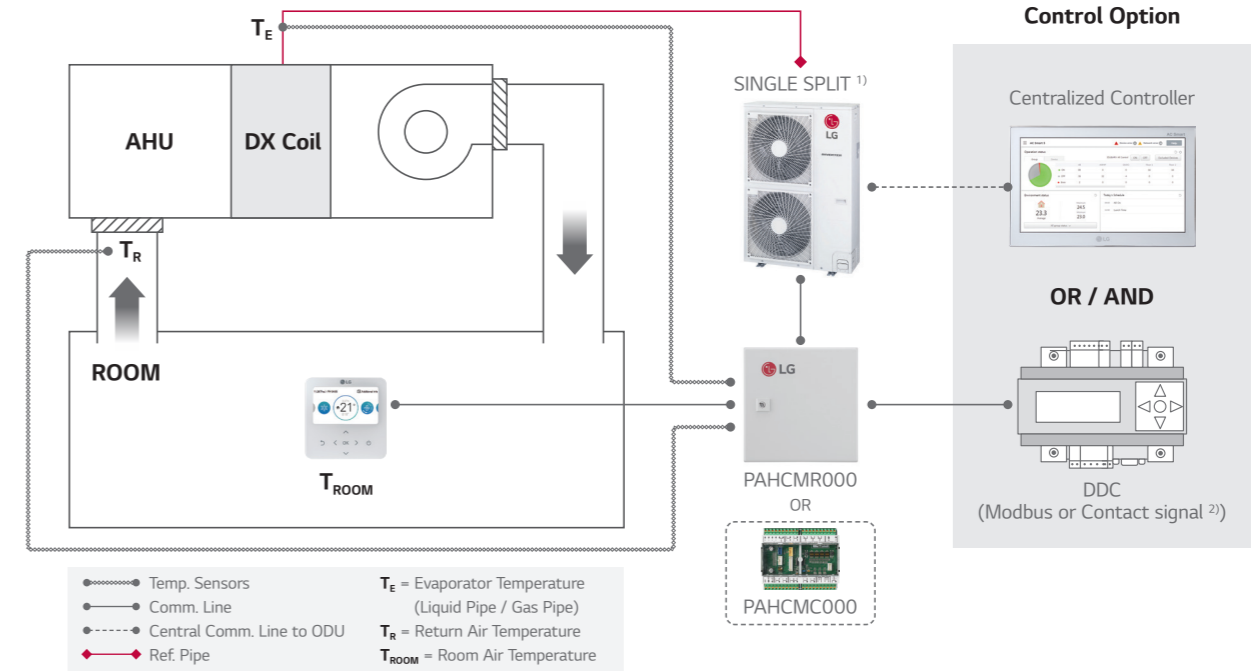
• Multiple module combination for large capacity AHU

DDC

Discharge Air control   Return Air control   Return Air control   Return Air control
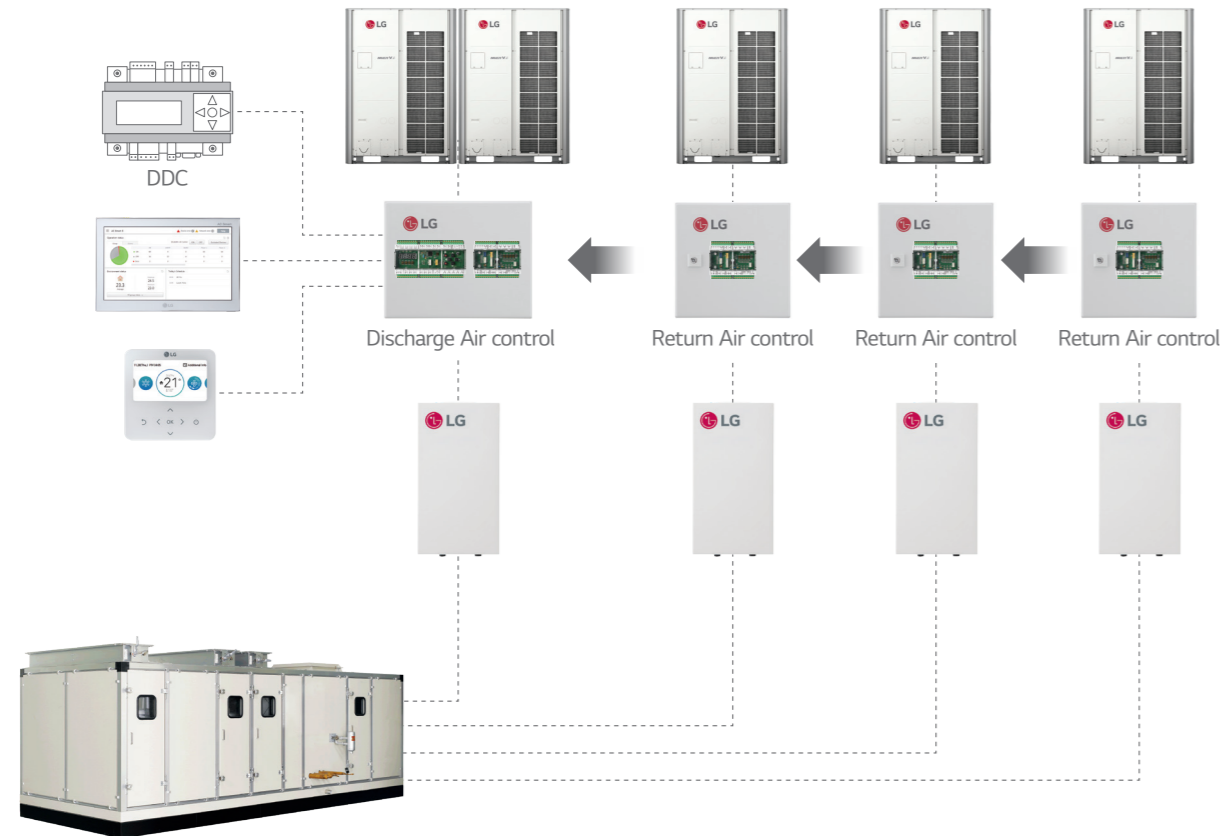
Communication Kit & Controller Module

Single Split Application

Single Split + Return / Room Air Temperature Control

Control Option

T_E

SINGLE SPLIT [1]

AHU   DX Coil

Centralized Controller

T_R

ROOM

OR / AND

T_{ROOM}

PAHCMR000
OR

PAHCMC000

DDC
(Modbus or Contact signal [2])

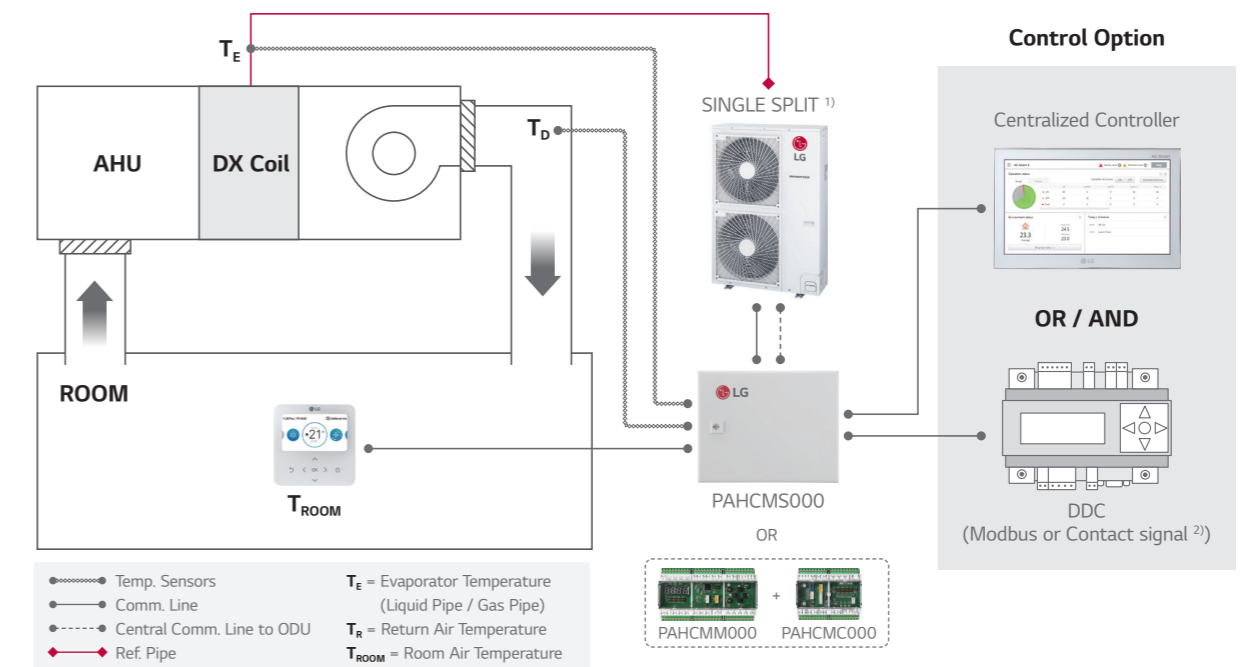| Temp. Sensors	T_E = Evaporator Temperature
Comm. Line	(Liquid Pipe / Gas Pipe)
Central Comm. Line to ODU	T_R = Return Air Temperature
Ref. Pipe	T_{ROOM} = Room Air Temperature

1) PI485 (PMNFP14A1) is required for centralized controller.
2) In case of applying DDC with contact signal, discharge air temperature should be measured and controlled by DDC.
Note : For more detail, please refer to the PDB.

Single Split Application

Single Split + Discharge Air Temperature Control

Control Option

T_E

SINGLE SPLIT [1]

AHU   DX Coil

T_D

Centralized Controller

ROOM

OR / AND

T_{ROOM}

PAHCMS000
OR

PAHCMM000 + PAHCMC000

DDC
(Modbus or Contact signal [2])

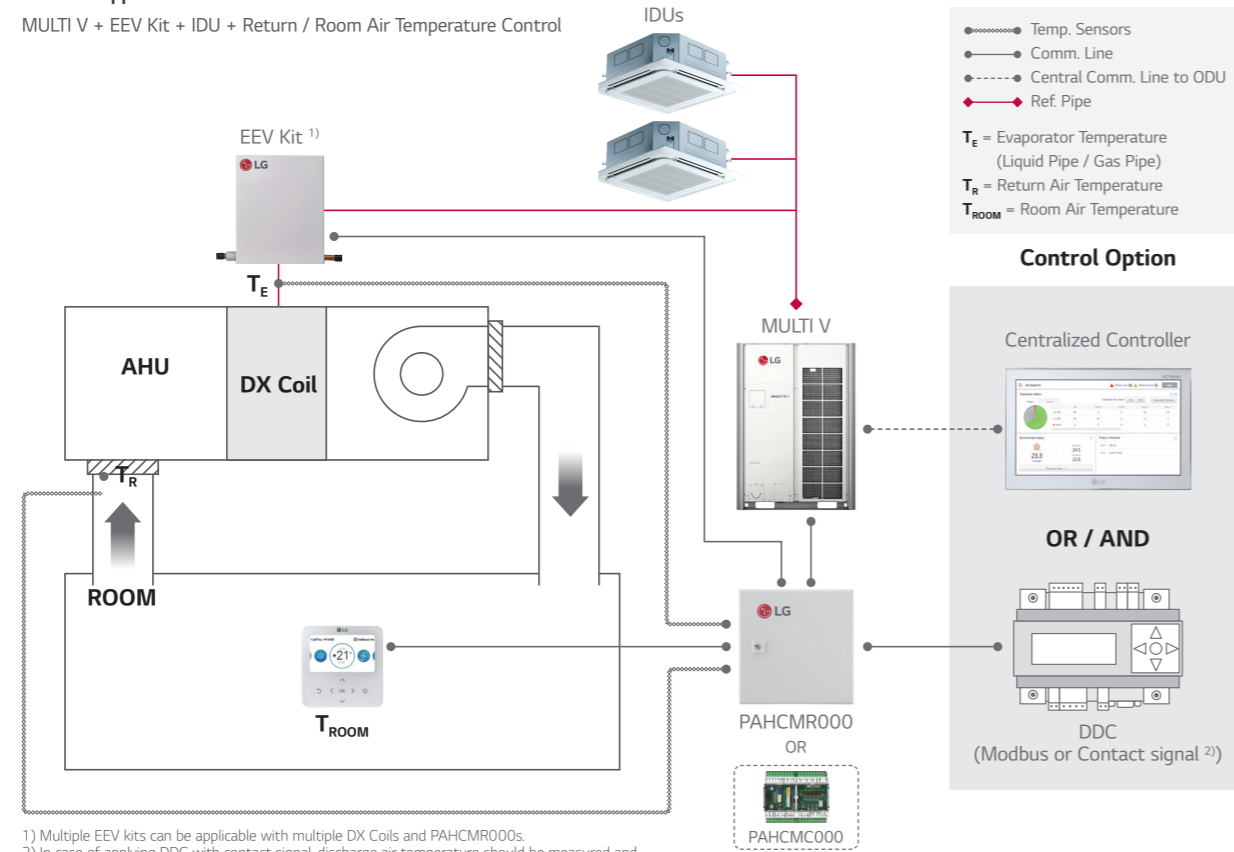| Temp. Sensors	T_E = Evaporator Temperature
Comm. Line	(Liquid Pipe / Gas Pipe)
Central Comm. Line to ODU	T_R = Return Air Temperature
Ref. Pipe	T_{ROOM} = Room Air Temperature

1) PI485 (PMNFP14A1) is required for centralized controller.
2) In case of applying DDC with contact signal, discharge air temperature should be measured and controlled by DDC.
Note : For more detail, please refer to the PDB.

AHU Kit

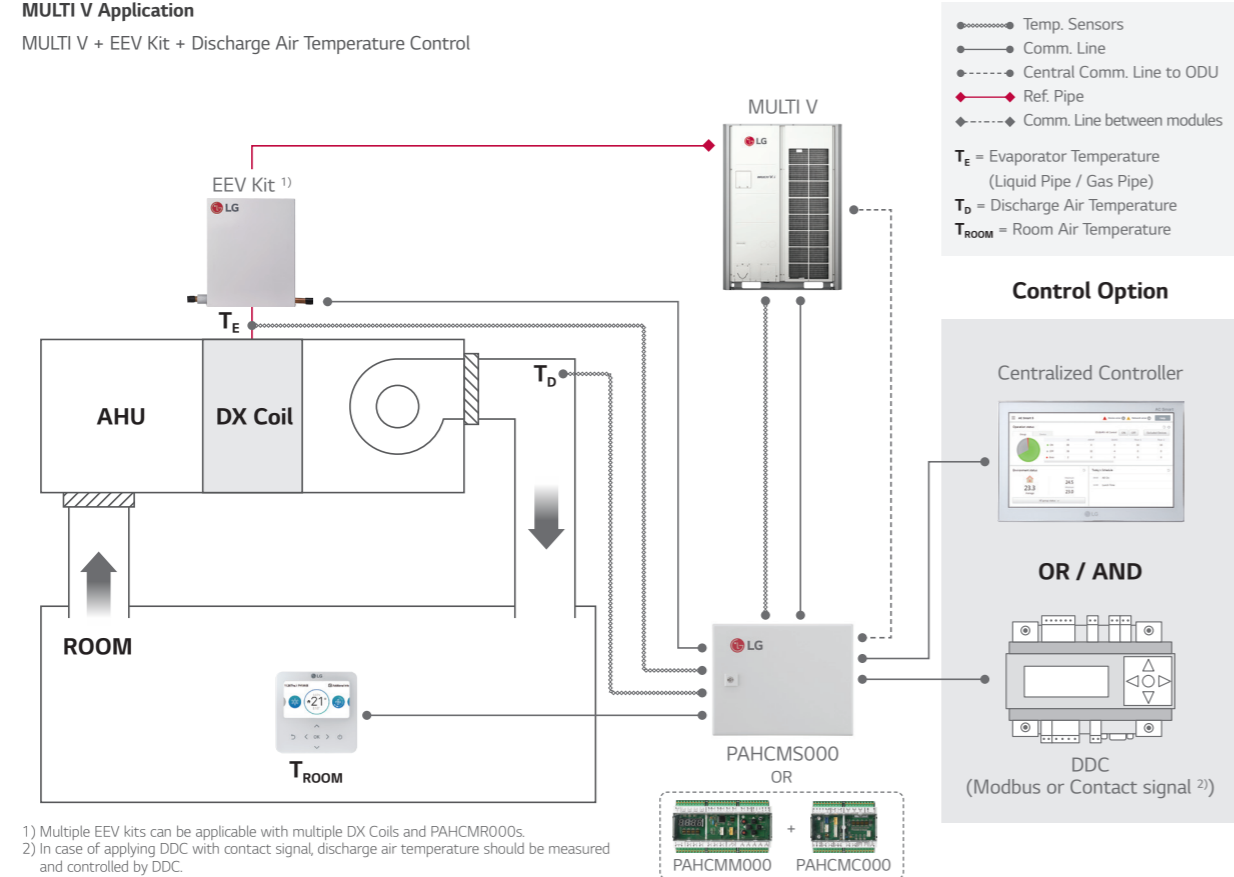## Communication Kit & Controller Module

MULTI V Application

MULTI V + EEV Kit + IDU + Return / Room Air Temperature Control

IDUs

EEV Kit [1]

T_E

AHU | DX Coil

T_R

ROOM

T_{ROOM}

MULTI V

PAHCMR000
OR
PAHCMC000

- Temp. Sensors
- Comm. Line
- Central Comm. Line to ODU
- Ref. Pipe

T_E = Evaporator Temperature (Liquid Pipe / Gas Pipe)
T_R = Return Air Temperature
T_{ROOM} = Room Air Temperature

Control Option

Centralized Controller

OR / AND

DDC (Modbus or Contact signal [2])

1) Multiple EEV kits can be applicable with multiple DX Coils and PAHCMR000s.
2) In case of applying DDC with contact signal, discharge air temperature should be measured and controlled by DDC.
Note : For more detail, please refer to the PDB.

MULTI V Application

MULTI V + EEV Kit + Discharge Air Temperature Control

MULTI V

EEV Kit [1]

T_E

AHU | DX Coil

T_D

ROOM

T_{ROOM}

PAHCMS000
OR
PAHCMM000 + PAHCMC000

- Temp. Sensors
- Comm. Line
- Central Comm. Line to ODU
- Ref. Pipe
- Comm. Line between modules

T_E = Evaporator Temperature (Liquid Pipe / Gas Pipe)
T_D = Discharge Air Temperature
T_{ROOM} = Room Air Temperature

Control Option

Centralized Controller

OR / AND

DDC (Modbus or Contact signal [2])

1) Multiple EEV kits can be applicable with multiple DX Coils and PAHCMR000s.
2) In case of applying DDC with contact signal, discharge air temperature should be measured and controlled by DDC.
Note : For more detail, please refer to the PDB.

Communication Kit Function

Communication with DDC via Contact Signal

	FUNCTION LIST	PAHCMR000 (PAHCMC000)	PAHCMS000 (PAHCMM000 + PAHCMC000)	TYPE	NOTE
Control [1]	Operation On / Off	On / Off	On / Off	Digital Input (Non Voltage)	-
	Operation Mode	Cooling / Heating	Cooling / Heating	Digital Input (Non Voltage)	Available operation mode can vary depending on the settings of Communication Kit
	Return (Room) Air Temperature [2]	16 ~ 30 °C	-	Analog Input (DC 0 ~ 10 V / 20mA)	-
	Discharge Air Temperature [2]	-	-	-	Discharge air temperature should be controller directly by DDC using 'ODU Capacity Control'
	Fan Speed [3]	-	High / Middle / Low	Digital Input (Non Voltage)	-
	Forced Thermal	On / Off	-	Digital Input (Non Voltage)	-
	ODU Capacity	-	10 ~ 100%	Analog Input (DC 0 ~ 10 V / 20mA)	-
	Emergency Stop	-	Stop / Normal	Digital Input (Non Voltage)	-
Monitor	Operation	On / Off	On / Off	Digital Output (Max. : DC 30 V / 1 A, AC 250V / 1 A)	For PACHMR000, dip sw1-3 DO Type should be set 'Off' (Status), In this case, 'fan speed' cannot be monitored by DO ports
	Operation Mode	-	-	-	It needs to be checked through control signal
	Fan Speed	High / Middle / Low	High / Middle / Low	Digital Output (Max. : DC 30 V / 1 A, AC 250V / 1 A)	For PACHMR000, dip sw1-3 DO Type should be set 'On' (Fan Mode) In this case, 'On / Off, defrost, error Status' cannot be monitored by DO ports
	Defrost Operation	Defrost / Normal	Defrost / Normal	Digital Output (Max. : DC 30 V / 1 A, AC 250V / 1 A)	For PACHMR000, dip sw1-3 DO Type should be set 'OFF' (Status), In this case, 'fan speed' cannot be monitored by DO ports
	Error Alarm	Error / Normal	Error / Normal	Digital Output, Relay C contact (Max. : DC 30 V / 1 A, AC 250V / 1 A)	
	Compressor On / Off	-	On / Off	Digital Output, (Max. : DC 30 V / 1 A, AC 250V / 1 A)	-

1) Control functions for LG individual and central controller are not available in case of using together with DDC via contact signal.
2) The range of temp. is differ depending on the type of the controller.
3) To control fan speeds, DO port of the fan speed status should be connected to the fan control panel.
Note : For more detail information, please refer to the product data book.

Communication with DDC via Modbus protocol

	FUNCTION LIST	PAHCMR000 (PAHCMC000)	PAHCMS000 (PAHCMM000 + PAHCMC000)	NOTE
Control [1]	Operation On / Off	On / Off	On / Off	
	Operation Mode	Cooling / Heating / Fan	Cooling / Heating / Fan	
	Return (Room) Air Temperature	16 ~ 30 °C	-	
	Discharge Air Temperature [2]	-	○	Dip SW1-2 Discharge Temp. Control Type should be set 'On' Standard II : 16 ~ 30 °C Standard III [4] : 12 ~ 50 °C
	Fan Speed [3]	High / Middle / Low	-	
	Forced Thermal On / Off	-	-	
	ODU Capacity Control [2]	-	10 ~ 100%	Dip SW1-2 Discharge Temp. Control Type should be set 'On'
	Emergency Stop	-	-	
Monitor	Operation	On / Off	On / Off	
	Operation Mode	Cooling / Heating / Fan	Cooling / Heating / Fan	
	Return (Room) Air Temperature	○	-	Corresponding air temperature sensor connected to AHU Comm.Kit is required
	Discharge Air Temperature	-	○	
	Fan Speed	High / Middle / Low	High / Middle / Low	
	Defrost Operation	Defrost / Normal	Defrost / Normal	
	Error Alarm	Error / Normal, Error code	Error / Normal, Error code	
	Compressor On / Off	On / Off	On / Off	

※ ○ : Applied, – : Not Applied
1) Control functions for LG individual and central controller are not available in case of using together with DDC via contact signal.
2) In case of PAHCMS000, control type between "Discharge Air Temperature" and "ODU Capacity Control" is selectable.
3) To control fan speeds, DO port of the fan speed status should be connected to the fan control panel.
4) Standard III wired remote controller after version 2.10.5a.
Note : For the Modbus memory map and more detail information, please refer to the product data book.

AHU Kit

Communication Kit Function

With LG Control System (Individual & Centralized Controller)

FUNCTION LIST		PAHCMR000 (PAHCMC000)	PAHCMS000 (PAHCMM000 + PAHCMC000)	NOTE
Control [1]	Operation On / Off	On / Off	On / Off	-
	Operation Mode	Cooling / Heating / Fan	Cooling / Heating / Fan	Available operation mode can vary depending on the settings of Communication Kit
	Return (Room) Air Temperature [2]	16 ~ 30 °C	-	-
	Discharge Air Temperature [2]	-	○	Standard II : 16 ~ 30 °C Standard III [4] : 12 ~ 50 °C Central Controllers : 12 ~ 50 °C
	Fan Speed [3]	High / Mid / Low	High / Mid / Low	To control the AHU fan, dip switch 1-3 'DO type' should be set 'On (Fan Speed)' (PAHCMR000)
Monitor	Operation	On / Off	On / Off	-
	Operation Mode	Cooling / Heating / Fan	Cooling / Heating / Fan	-
	Return (Room) Air Temperature	○	-	-
	Discharge Air Temperature		○	Standard II : 11 ~ 39.5 °C Standard III [4] : 0 ~ 100.0 °C Central : -50.0 ~ 100.0 °C
	Fan Speed	High / Middle / Low	High / Middle / Low	-
	Defrost Operation	On / Off	On / Off	Only with Individual Controller
	Error Alarm	Error Code	Error Code	Error code will be displayed on the screen
	Compressor On / Off	On / Off	On / Off	Only with Individual Controller

※ ○ : Applied, - : Not Applied
1) Control functions for LG individual and central controller are not available in case of using together with DDC via contact signal.
2) The range of setting temperature is different depending on the type of the controllers. And operation may different from setting range.
3) To control fan speeds, DO port of the fan speed status should be connected to the fan control panel.
4) Standard III wired remote controller after version 2.10.5a.
Note : For more detail information, please refer to the product data book.

Compatibility with LG HVAC Controllers

CONTROLLER	INDIVIDUAL CONTROLLER			CENTRALIZED CONTROLLER					PDI
	PREMIUM	STANDARD III	STANDARD II	AC EZ	AC EZ TOUCH	AC SMART 5	ACP 5	AC MANAGER 5 [1]	PREMIUM STANDARD
Model no.	PREMTA000 PREMTA000A PREMTA000B	PREMTB100 PREMTBB10	PREMTB001	PQCSZ250S0	PACEZA000	PACS5A000	PACP5A000	PACM5A000	PQNUD1S40 PPWRDB000
PAHCMR000	○	○	○	○	○	○	○	○	○
PAHCMS000	-	○	○	-	-	○	○	○	-

※ ○ : Applied, - : Not Applied
1) AC Manager 5 is an integrator, so the installation with AC Smart 5 or ACP 5 is required.
Note : 1. Dry contact for indoor unit (PDRYCB000 / 400 / 300 / 500) is not applied.
       2. For more details, please refer to the product data book.

Outdoor Unit Compatibility

For Small Size Application (~ 15kW) - Single Split

TYPE	MODEL	UUA1 (2.5 ~ 5.0 KW) 1)	UUB1 (5.0 ~ 8.0 KW) 1)	UUC1 (7.1 ~ 10.0 KW) 1)	UUD1 / UUD3 (10.0 ~ 15.0 KW) 1)
Communication Kit (Controller Module)	PAHCMR000 (PAHCMC000)	-	○	○	○
	PAHCMS000 (PAHCMM000 + PAHCMC000)	-	○	○	○
Control Kit	PAHCNM000	-	-	-	-

1) When connecting to Single Split outdoor unit, please check the compatibility to the regional sales office.

For Medium-Large Size Application (~ 672 kW) - MULTI V

TYPE	MODEL	MULTI V					MULTI V WATER		
		i	5	IV	III	S	5	IV	II
Communication Kit (Controller Module)	PAHCMR000 (PAHCMC000)	○	○	○	○	○	○	○	○
	PAHCMS000 (PAHCMM000 + PAHCMC000)	○	○	○	○	○	○	○	○
Control Kit	PAHCNM000	○	○	○	○	○	○	○	○

EEV Kit Compatibility

EEV KIT MODEL	CAPACITY INDEX (KW)		AHU APPLICATION KITS (MAXIMUM CONNECTABLE EEV KITS)			CONNECTION BY ODU SYSTEM		
	MIN.	MAX.	PAHCMR000 (PAHCMC000)	PAHCMS000 (PAHCMM000 + PAHCMC000)	PAHCNM000	MULTI V HEAT PUMP	MULTI V HEAT RECOVERY	SINGLE SPLIT
PRLK048A0	3.6	28	○ (1)	○ (1)	○ (6)	○	○	-
PRLK096A0	28.1	56	○ (1)	○ (1)	○ (6)	○	○ (Max. 33.7 kW)	-
PRLK396A0	56.1	112	○ (1)	○ (1)	○ (6)	○	-	-
PRLK594A0	112.1	168	-	○ (1)	○ (3)	○	-	-

※ ○ : Applied, - : Not applied
Note 1. Table of the outdoor unit compatibility is based on European regional model.
2. When connecting outdoor units in other areas, please check whether they are compatible or not.
3. Expansion application kit compatibility is based on capacity index of the system, it may changed according to system design condition.

AHU Kit

Control Kit

Field Supplied Item

LIST	REQUIRED SPECIFICATION	APPLY LOCATION
Temperature / Humidity Sensor	- Power : AC 24 V - Output signal : DC 0 ~ 10 V - Temperature range : -40 °C ~ 70 °C - Humidity range : 0 ~ 95 % RH	Supply air duct, Return air duct, Outdoor air duct
Temperature Sensor	- Power : AC 24 V - Output signal : DC 0 ~ 10 V - Temperature range : -50 °C ~ 50 °C	Supply air duct, Return air duct, Mixed air duct
Damper Actuator	- Power : AC 24 V - Input / output signal : DC 0 ~ 10 V - Torque : 15 N·m - Operation time : 150 s - Rotation Angle : 90°	Outdoor air damper, Exhaust air damper, Mixed damper
Filter Differential Pressure Sensor	- Power : AC 24 V - Output signal : DC 0 ~ 10 V - Range: 0 ~ 1,000 Pa - Switch type : Relay open / close	Filter
Static Pressure Sensor	- Power : AC 24 V - Output signal : DC 0 ~ 10 V - Range : 0 ~ 1,000 Pa	Supply air duct
CO₂ Sensor	- Power : AC 24 V - Output signal : DC 0 ~ 10 V - Range : 0 ~ 2,000 ppm	Return air duct
Smoke Detector	- Power : AC 24 V - Type : Contact	Return air duct

Various Control with Control Kit – Multiple MULTI V + EEV Kits

Field Supplied Item