ACCESSORIES INSTALLATION

THERMA V can interface to various accessories to extend its functionality and to improve user convenience. In this chapter, specifications about supported 3rd party accessories and how to connect to THERMA V is introduced.

It is noted that this chapter only deal with 3rd party accessories. For accessories supported by LG Electronics, please refer to installation manual of each accessories.

Accessories supported by LG Electronics

Item	Purpose	Model
DHW Tank Install Kit	To operate with DHW tank	PHLTB
Thermistor for DHW Tank	To control hot water temperature of DHW tank	PHRSTA0
Remote Temperature Sensor	To control by air temperature	PQRSTA0
Dry Contact	To receive on & off external signal	PDRYCB000
	Dry Contact For Thermostat	PDRYCB300
Solar thermal Kit	To operate with solar heating system	PHLLA(Limit temperature : 96 °C)
Meter Interface	To measure production / consumption power	PENKTH000
Central Controller	Multiple installed products into one central control	
Backup heater	To supplement insufficient capacity	HA031M E1 / HA061M E1 / HA063M E1
Wi-Fi Modem	To enable remote system operation from smartphone	PWFMDD200
Thermistor for 2nd Circuit	To interlock with 2nd circuit operation and control temperature of main zone.	PRSTAT5K10
Extension wire	To connect remote controller with Indoor PCB for communication	PZCWRC1
PI485	To communicate and control through the central controller	PMNFP14A1

Accessories supported by 3rd party Companies

Item	Purpose	Specification
Solar Heating System	To generate auxiliary heating energy for water tank	• Solar collector • 3way valve(B)
Mix Kit	To use 2nd Circuit	• Mixing valve • Mix pump
3rd Party Boiler	To use auxiliary boiler.	
3rd Party Controller	To connect external controller using modbus protocol	
Thermostat	To control by air temperature	Heating-Only type (230 V AC) Cooling/Heating type (230 V AC with Mode selection switch)
3way valve and actuator	(A) : To control water flow for hot water heating or floor heating / To control water flow when installing 3rd party boiler (B) : To control close/open mode of solar circuit	3 wire, SPDT (Single Pole Double Throw) type, 230 V AC
2way valve and actuator	To control water flow for Fan Coil Unit / To serve as 3way valve when installing backup heater	2 wire, SPST(Single Pole Sing Throw) type, 230 V AC
External Pump	To retain sufficient capacity using additional pump	
Smart Grid	To control operation mode depending on input signal from provider	

Before Installation

⚠ WARNING

Followings should be kept before installation
- Main power must be turned off during installing 3rd party accessories.
- 3rd party accessories should be comply with supported specification.
- Proper tools should be chosen for installation.
- Never do installation with wet hands.

Thermostat

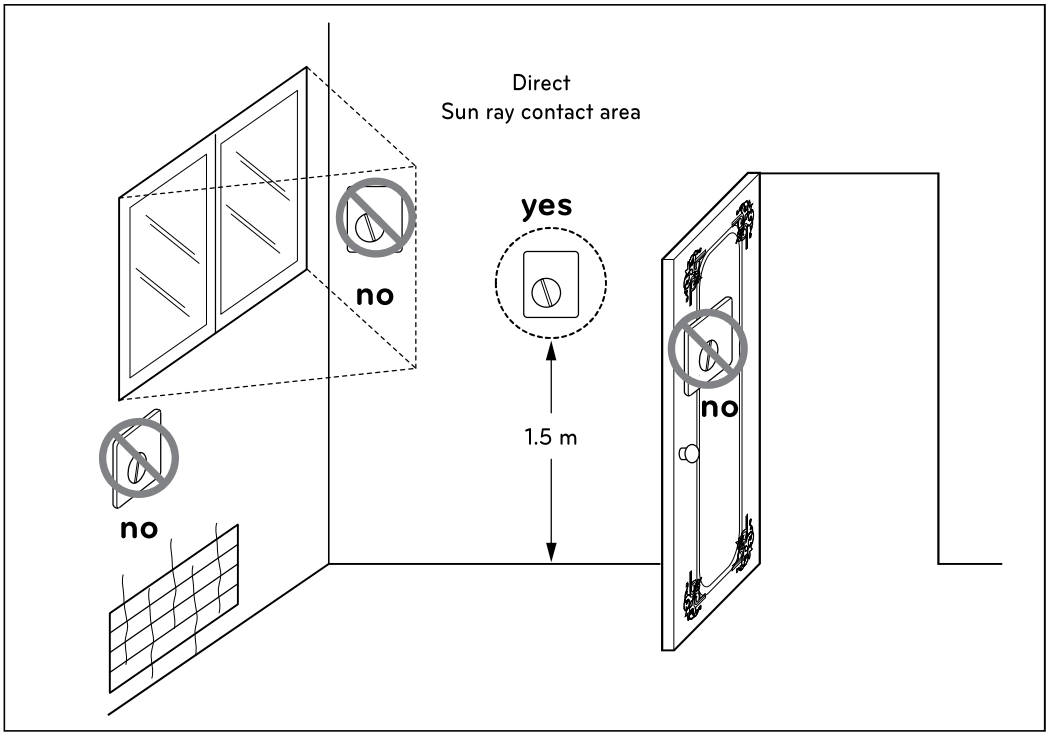
Thermostat is generally used to control the product by air temperature. When thermostat is connected to the product, the product operation is controlled by the thermostat.

Installation condition

⚠ CAUTION

- USE 220-240 V~ Thermostat
- Some electro-mechanical type thermostat has internal delay time to protect compressor. In that case, mode change can takes time more than user's expectation. Please read thermostat manual carefully if the unit does not response quickly.
- Setting temperature range by thermostat can be different with that of the unit. The heating or cooling set temperature should be chosen within the setting temperature range of the unit.
- It is highly recommended that the thermostat should be installed where space heating is mainly applied.

Following location should be avoid to secure proper operation :
- Height from floor is approximately 1.5 m.
- Thermostat can not be located where the area may be hidden when door is open.
- Thermostat can not be located where external thermal influence may be applied. (such as above heating radiator or open window)



General Information

The Heat Pump supports following thermostats.

Type	Power	Operating Mode	Supported
Mechanical (1)	230 V~	Heating Only (3)	Yes
		Heating / Cooling (4)	Yes
Electrical (2)	230 V~	Heating Only (3)	Yes
		Heating / Cooling (4)	Yes

(1) There is no electric circuit inside the thermostat and electric power supply to the thermostat is not required.

(2) Electric circuit such as display, LED, buzzer, etc is included in the thermostat and electric power supply is required.

(3) Thermostat generates "Heating ON or Heating OFF" signal according to user"s heating target temperature.

(4) hermostat generates both "Heating ON or Heating OFF" and "Cooling ON or Cooling OFF" signal according to user"s heating and cooling target temperature.

⚠ CAUTION

Choosing heating / cooling thermostat

- Heating / cooling thermostat must have "Mode Selection" feature to distinguish operation mode.
- Heating / cooling thermostat must be able to assign heating target temperature and cooling target temperature differently.
- If above conditions are not kept, the unit can not operation properly.
- Heating / cooling thermostat must send cooling or heating signal immediately when temperature condition is satisfied. No delay time while sending cooling or heating signal is permitted.

How to wire thermostat

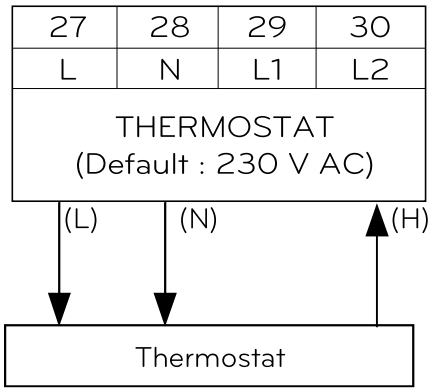
Follow below procedures Step 1 ~ Step 5.

Step 1. Uncover front cover of the unit and open the control box.

Step 2. Identify the power specification of the thermostat. If it is 220-240 V~, go to Step 3.

Step 3. If it is Heating only thermostat, go to step 4. Otherwise, if it is Heating / cooling thermostat, go to step 5.

Step 4. Find terminal block and connect wire as below. After connecting, go to step 5.



⚠ WARNING

Mechanical type thermostat

Do not connect wire (N) as mechanical type thermostat does not require electric power supply.

⚠ CAUTION

Do not connect external electric loads.

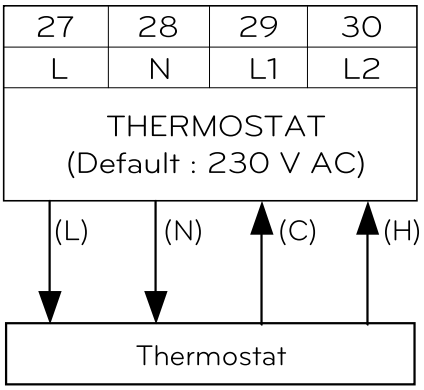
Wire (L) and (N) should be used only for operation electric type thermostat.
Never connect external electric loads such as valves, fan coil units, etc. If connected, Main PCB (Heater) can be seriously damaged.

(L) : Live signal from PCB to thermostat

(N) : Neutral signal from PCB to thermostat

(H) : Heating signal from thermostat to PCB

Step 5. Find terminal block and connect wire as below.



⚠ WARNING

Mechanical type thermostat

Do not connect wire (N) as mechanical type thermostat does not require electric power supply.

⚠ CAUTION

Do not connect external electric loads.

Wire (L) and (N) should be used only for operation Electric type thermostat.

Never connect external electric loads such as valves, fan coil units, etc. If connected, Main PCB (Heater) can be seriously damaged.

(L) : Live signal from PCB to thermostat

(N) : Neutral signal from PCB to thermostat

(C) : Cooling signal from thermostat to PCB

(H) : Heating signal from thermostat to PCB

Final check

- DIP switch setting :
  Set DIP switch No. 8 to 'ON'. Otherwise, the unit can not recognize the thermostat.
- Remote Controller :
  - 'Thermostat' text is displayed on the remote controller.
  - Button input is prohibited.

2nd Circuit

The 2nd circuit is generally used to control the temperature of 2 rooms differently. To use the 2nd Circuit, you need to prepare a separate Mix Kit. The mix kit must be installed in the main zone.

- Main Zone : zone where the water temperature is lowest when heating.
- Add. Zone : The other zone

[Install Guide 2nd Circuit Heating]

Main Zone / Add. Zone	Floor (35 °C)	Convector (FCU, 45 °C)	Radiator (45 °C)	Radiator (55 °C)
Floor (35 °C)	○	X	X	X
Convector (FCU, 45 °C)	○	○	○	X
Radiator (45 °C)	○	○	○	○
Radiator (55 °C)	○	○	○	○

[Install Guide 2nd Circuit Cooling]

Main Zone / Add. Zone	Floor (18 °C)	Radiator(18 °C)	Convector (FCU, 5 °C)
Floor (18 °C)	○	○	X
Radiator(18 °C)	○	○	X
Convector (FCU, 5 °C)	X	X	○

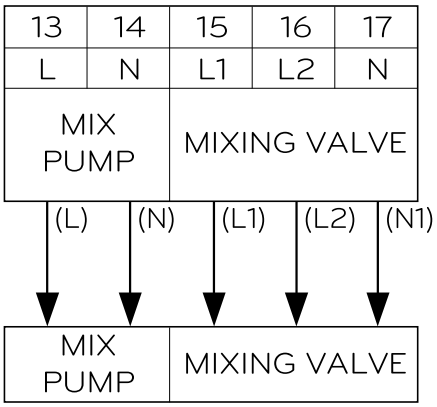
※ To use a floor combination during cooling operation, the flow through the floor of the flow must be blocked by the 2 way valve.

How to Wire 2nd Circuit

Follow below procedures Step 1 ~ Step 2.

Step 1. Uncover front cover of the unit.

Step 2. Find terminal block and connect wire as below



(L) : Live signal from PCB to mix pump

(N) : Neutral signal from PCB to mix pump

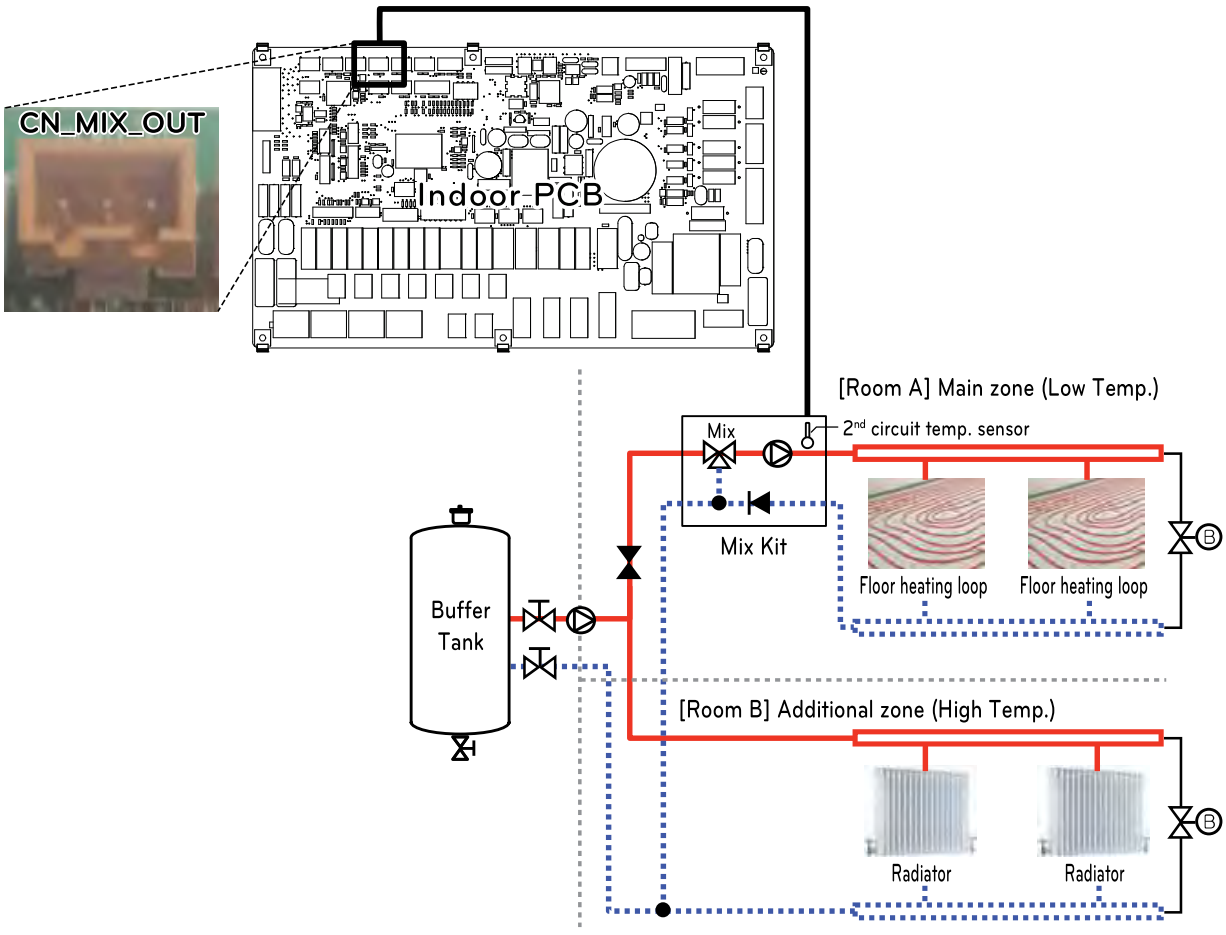
(L1) : Live signal (for Normal* Closed type) from PCB to mixing valve

(L2) : Live signal (for Normal Open type) from PCB to mixing valve

(N1) : Neutral signal from PCB to mixing valve

*Closed = NOT Mixed

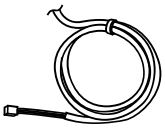
Step 3. Insert the temperature sensor to 'CN_MIX_OUT' (Brown) of the main PCB as shown below. The sensor should be mounted correctly to outlet pipe of mix kit water pump as shown below.



NOTE

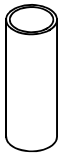
Temperature sensor specification:
Type : Thermistor,NTC
Resistance at 25 °C : 5 kΩ
Minimum operating temperature range : -30 °C~100 °C

[Thermistor for 2nd circuit]



Sensor

Sensor Holder



Sensor Connector

Follow below procedures step 1 ~ step 4.

Step 1. Install sensor connector to outlet pipe of mix kit water pump.
(Welding must be performed to connect the sensor connector to the pipe.)

Step 2. Check if the power of the unit is turned off.

Step 3. Fasten the sensor connector to the sensor holder as shown in the figure below.

Step 4. Insert harness into PCB(CN_TH4) fully and fix the thermal sensor into tube connector as shown below.

3rd Party Boiler

The product can be used by connecting an Auxiliary boiler. You can control the boiler automatically and manually by comparing the outside temperature and the set temperature.

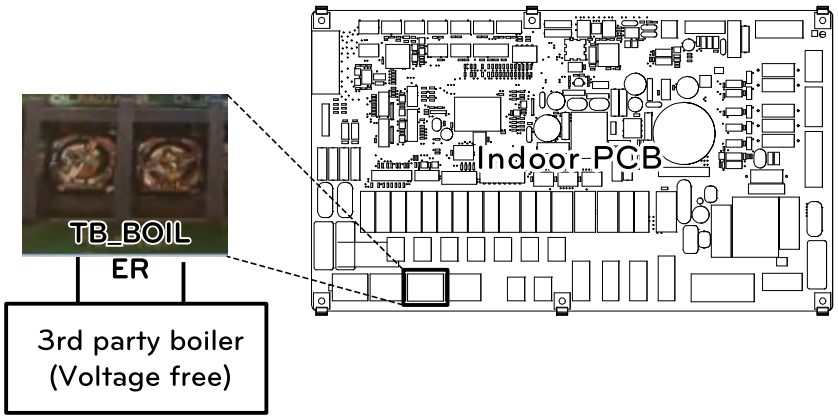
How to install 3rd party boiler

Follow below procedures step 1 ~ step 3.

Step 1. Check if the power of the unit is turned off.

Step 2. Disassemble front panels and Distinguish terminal block in Indoor PCB.

Step 3. Connect Power cable to terminal block (TB_BOILER) fully.



3rd Party Controller

The product can also be linked to 3rd party controller. You can connect external controllers using Modbus protocol except for LG controller. If 3rd party controller is used, LG controller is not applied to AWHP simultaneously.

How to install 3rd party controller

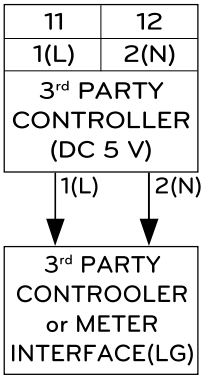
Follow below procedures step 1 ~ step 4.

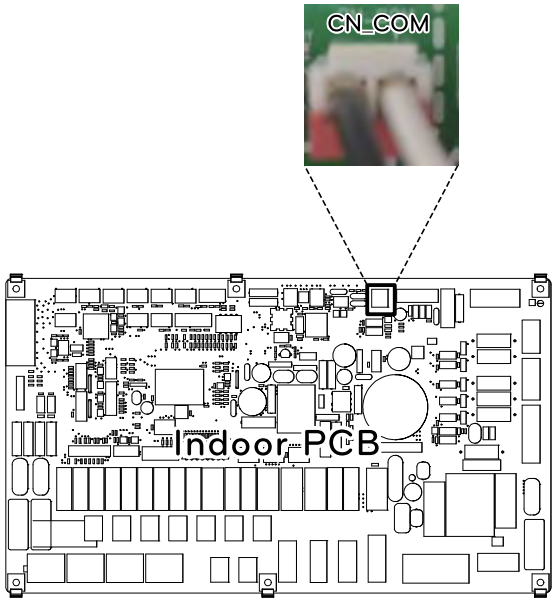
Step 1. Check if the power of the unit is turned off.

Step 2. Disassemble front panels and distinguish control box(Indoor) of the unit.

Step 3. Check if the harness(White) is inserted fully to the indoor unit PCB (CN_COM).

Step 4. Connect the 3rd party controller to terminal block 2(11/12) completely. (including Meter interface module)



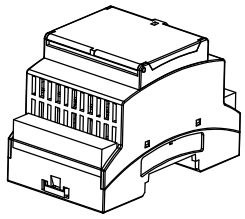


Meter Interface

This product can be used by connecting the meter interface module supplied in the field. The meter interface module can communicate with the wired remote controller. The meter interface module lets you know the amount of power generated by the product.

How to install Meter Interface

[Parts of Meter interface]



Meter interface body

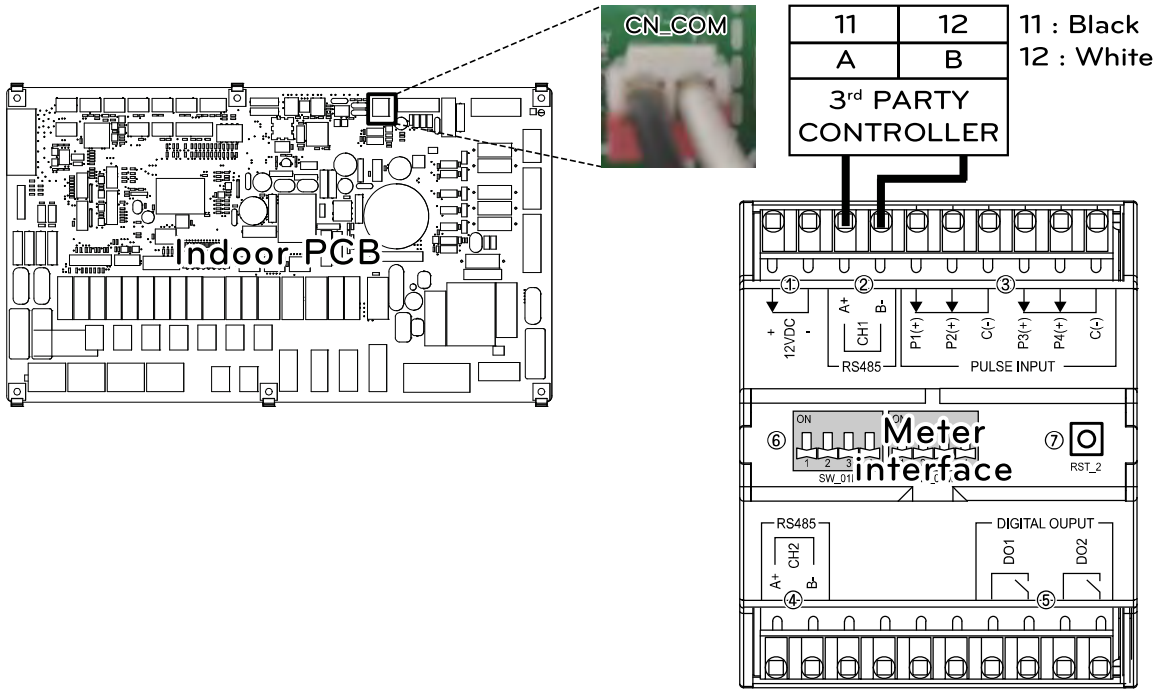
Follow below procedures step 1 ~ step 4.

Step 1. Check if the power of the unit is turned off.

Step 2. Disassemble front panels and Distinguish control box(Indoor) of the unit.

Step 3. Check if the harness(White) is inserted fully to the indoor unit PCB (CN_COM).

Step 4. Connect the external pump to terminal block 2(11/12).



Central Controller

The product can communicate and control through the central controller. The following functions can be controlled in the central control linked state (Operation/Stop, Desired temperature, Hot water operation / stop, Warm water temperature, Full lock, Etc)

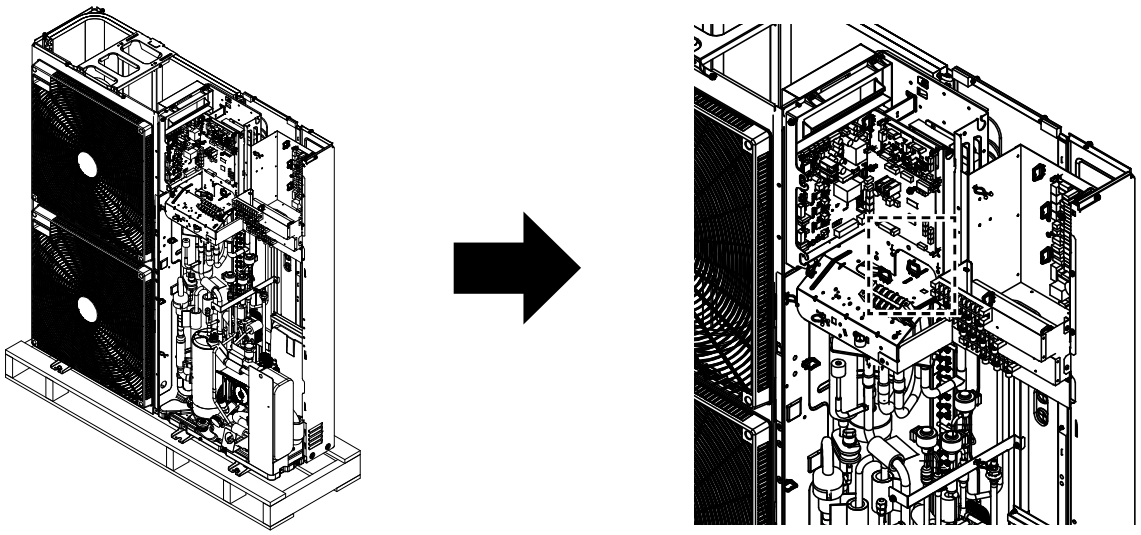
How to Installation PI485

Fix the PI485 PCB as shown in below images.

For detailed installation method refer to PI485 Installation Manual

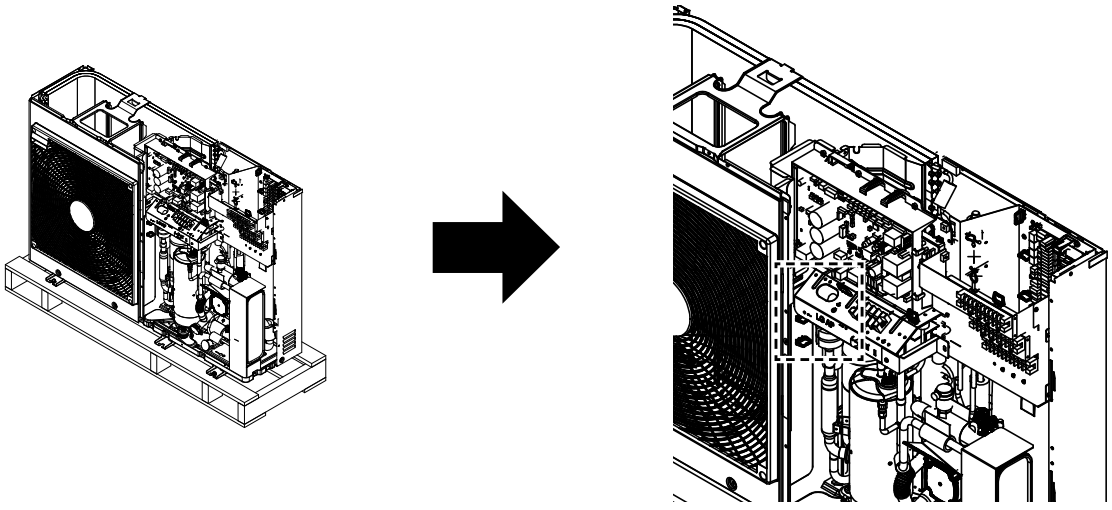
Product Heating Capacity : 12 kW, 14 kW, 16 kW

UN3 Chassis



Product Heating Capacity : 5 kW, 7 kW, 9 kW

UN4 Chassis



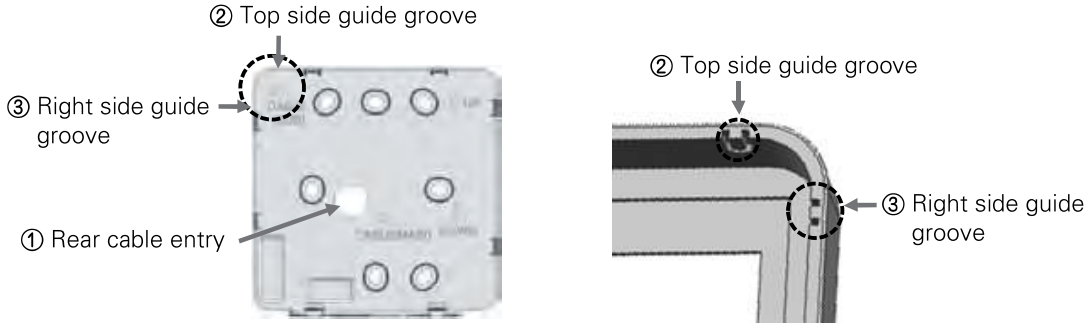
- For detailed installation instructions, refer to the manual included in the accessories.

Remote Controller

Installation of Remote Controller

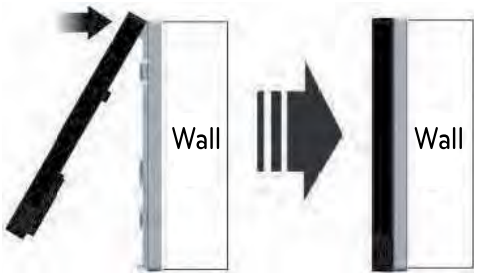
- After fixing the remote controller installation plate on the desired location, fix it firmly with the provided screws.
  - If the installation plate is not flat on the surface, it may result in the controller being twisted and cause a defect.
  - If there is a mounting box, install the remote controller installation plate using the fixings holes which suit, as in the below diagrams.
  - Do not leave a gap with the wall or product loose after the installation.

- The wired remote controller cable can be installed in 3 directions. Install to the suitable direction according to the installation environment.
  - Installation direction: Rear entry, top side, right side
  - When you install the remote controller cable at the top side and right side, remove the remote controller cable guide hole before the installation.
    ※ Use a long nose pliers to remove the guide hole.
- After removing the hole, trim the cut surface neatly.



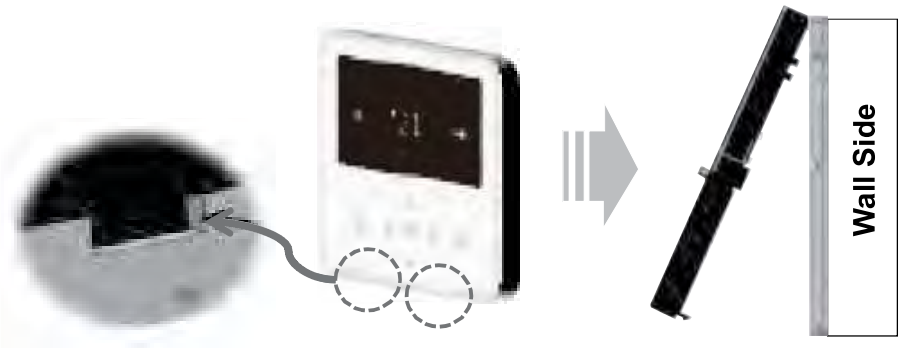
- After fixing the remote controller top side on the installation plate attached to the wall as in the following figure, press the bottom side to combine with the installation plate.
  - Do not leave a gap in the top, bottom, left, and right side of the remote controller and the installation plate after combining them.
  - Before combining with the installation plate, arrange the cables to avoid interference with the circuit parts.

<Order of Combining>



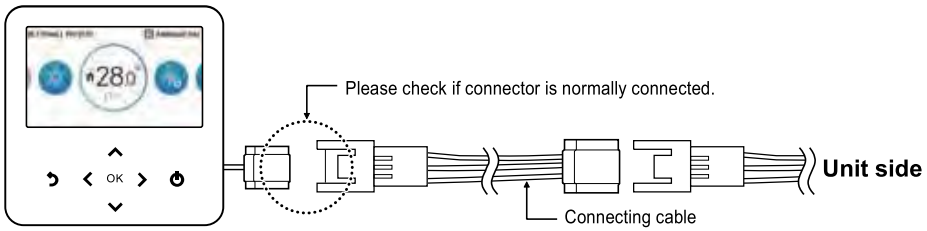
- When you remove the remote controller from the installation plate, insert a small flat head screwdriver into the bottom side separation hole and turn cloc kwise to separate the remote controller.
  - There are 2 separation holes at the bottom part. Slowly separate one by one.
  - Be careful not to damage the internal parts during the removal.

<Order of Separation>



- Use the connection cables to connect the indoor unit with the remote controller.

DC 12 V	Red
Signal	Yellow
GND	Black



- For the following cases, separately purchase and use the cables suitable for the situation.
  - Do not install the cable over 50 m. (It may cause communication issues.)
  - If the distance between the wired remote controller and the unit is 10 m or more : 10 m extension cable (model name: PZCWRC1)

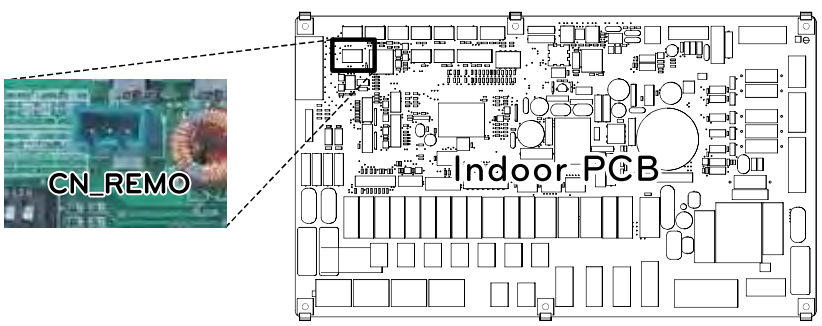
NOTE

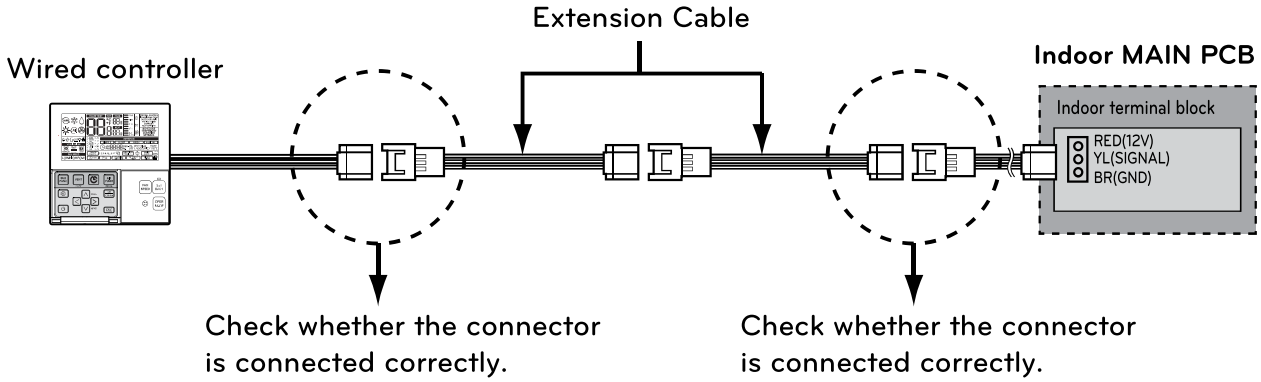
During the wired remote controller installation, do not bury it in the wall. (It may cause temperature sensor failure.)

Do not install the cable over 50 m. (It may cause communication defect.)

When you install the extension cable, carefully check the direction of the connectors on the remote controller side and the product side before the installation.

Specification of extension cable: AWG 24, 3 conductor or above.





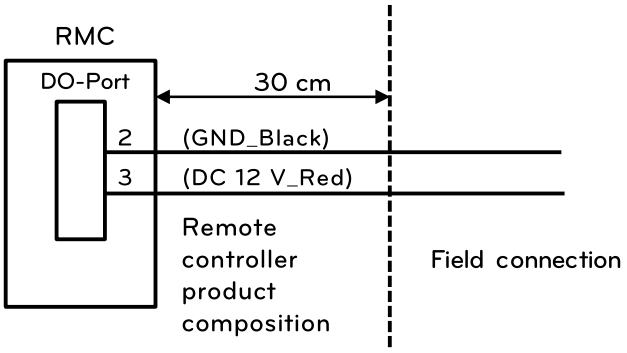
Cable connection method to use external device

1) Wired remote controller-cable connection method.
   - In the wired remote controller, connect the part marked in the following figure (J02C, DO-Port) to the cable.
   - According to the installation environment, there are 3 directions (Rear entry, top side, and right side) for the installation.
2) Cable extension connection method
   - Among the cables connected to the wired remote controller, cut the remaining connectors on the other side, and then extend and connect the cables
   - Extension cable specification: 24~26 AWG.

⚠ CAUTION

For the External device connection, use the cable insulated with sheath for the extension connection.

Before combining with the installation plate, arrange the cables to avoid interference with the internal parts.



• Output specification
  - Voltage : DC 11~12 V
  - Current : 5 mA

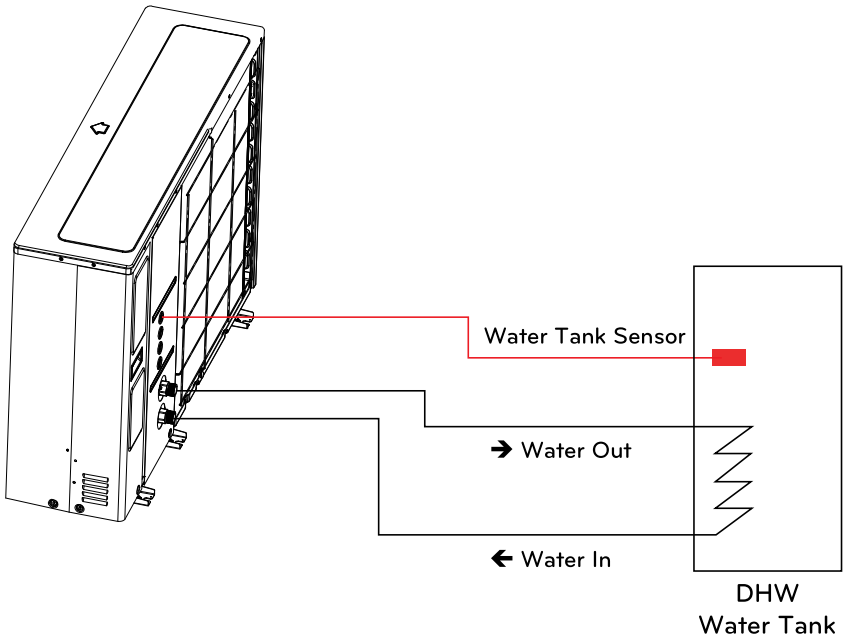
DHW Tank

To establish DHW circuit, 3way valve and DHW tank kit is required. If solar thermal system is pre-installed at the installation field, solar thermal kit is required to interface solar thermal system – to – DHW tank – to – THERMA V.

Installation condition

Installing DHW water tank requires following considerations :

- DHW water tank should be located at the flat place.
- Water quality should be complied with EN 98/83 EC directives.
- As this water tank is DHW water tank (indirect heat exchange), do not use anti water-freezing treatment like ethylene grycol.
- It is highly recommend to wash out inside of the DHW water tank after installation. It ensures generating clean hot water.
- Near the DHW water tank there should be water supply and water drain to easy access and maintenance.
- Set the maximum value of the temperature control device of DHW tank.



General Information

THERMA V supports following 3way valve.

Type	Power	Operating Mode	Supported
SPDT 3-wire (1)	230 V AC	Selecting “Flow A” between “Flow A” and “Flow B” (2)	Yes
		Selecting “Flow B” between “Flow A” and “Flow B” (3)	Yes

(1) : SPDT = Single Pole Double Throw. Three wires consist of Live1 (for selecting Flow A), Live 2 (for selecting Flow B), and Neutral (for common).

(2) : 'Flow A' means water flow from the unit to under floor water circuit.

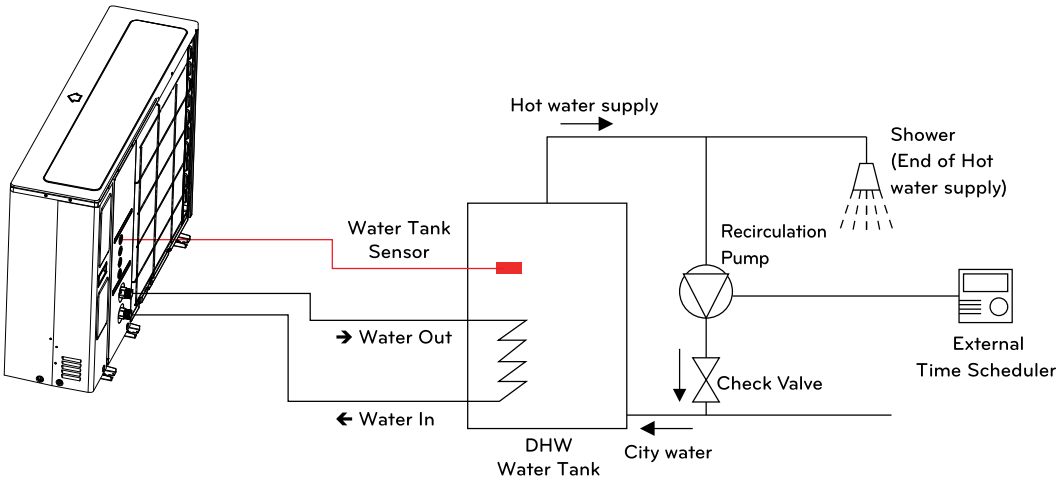
(3) : 'Flow B' means water flow from the unit to DHW tank.

WARNING

Installing recirculation pump

When THERMA V is used with DHW tank, it is STRONGLY recommended to install recirculation pump to prevent flooding out cold water at the end of hot water supply and to stabilize the water temperature inside DHW tank

- The recirculation pump should be operated when DHW demand is not required. Therefore, external time scheduler to determine when the recirculation pump should turn on and turn off is required.
- The operating duration time of the recirculation pump is calculated as follow :
  Duration time [minute] = k x V x R
  k : 1.2 ~ 1.5 is recommended. (If distance between pump and tank is far, then choose high number)
  V : Volume of DHW water tank [liter]
  R : Water flow rate of pump [liter per minute], which is determined by pump performance curve
- The pump operating start time should be prior to the DHW water demand.



How to Wire DHW Tank Heater

Step 1. Uncover heater cover of the DHW tank. It is located side of the tank.

Step 2. Find terminal block and connect wires as below. Wires are field-supplied item.

(L) : Live signal from PCB to Heater

(N) : Neutral signal from PCB to Heater

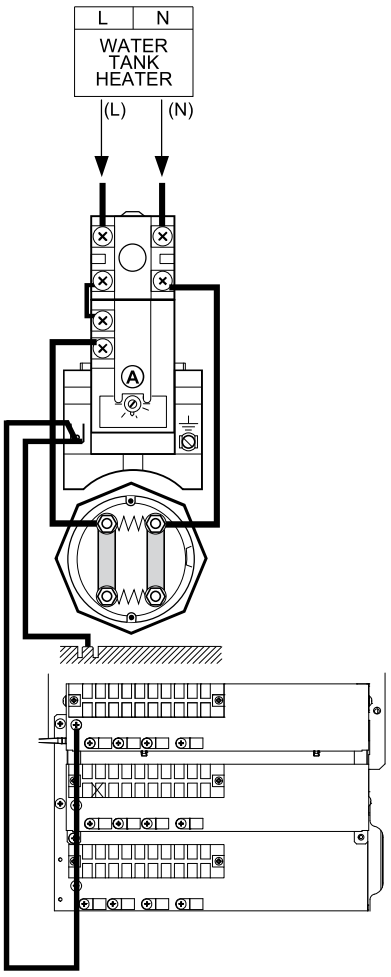
⚠ WARNING

Wire specification

- Cross-sectional area of the wire should be 6 mm^2.

Adjusting thermostat temperature

- To guarantee proper operation, it is recommended to set temperature of thermostat to maximum temperature (symbol at the picture).
- 1Ø Electric Heater Model and 3Ø Electric Heater Model are set by same method as below.

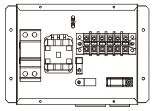


DHW Tank Kit

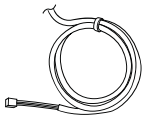
This product can be used by connecting the DHW tank kit in the field. It can be utilized hot water heated by booster heater in DHW tank.

How to install DHW tank kit

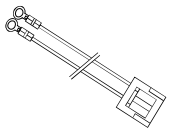
[Parts of DHW Tank Kit]



Tank kit body



Sensor



Multi harness

Temperature sensor for DHW tank is used to control hot water temperature of DHW tank. If sensor will be defective, you can purchase it separately.(Model name : PHRSTA0)

Follow below procedures step 1 ~ step 4.

Step 1. Uncover DHW tank kit and locate it on the wall.

Step 2. Connect Harness(Violet) of Main PCB assembly(TB1(6/7)) to 'CN_B_Heat_A' of the Main PCB like following fig. 1.

Step 3. Insert DHW tank sensor to 'CN_TH4' (Red) of the Main PCB refer as below.

Step 4. Connect power supply to the DHW tank kit as shown fig. 1.

❉ The sensor should be mounted correctly to the sensor hole of DHW water tank like below fig. 2.

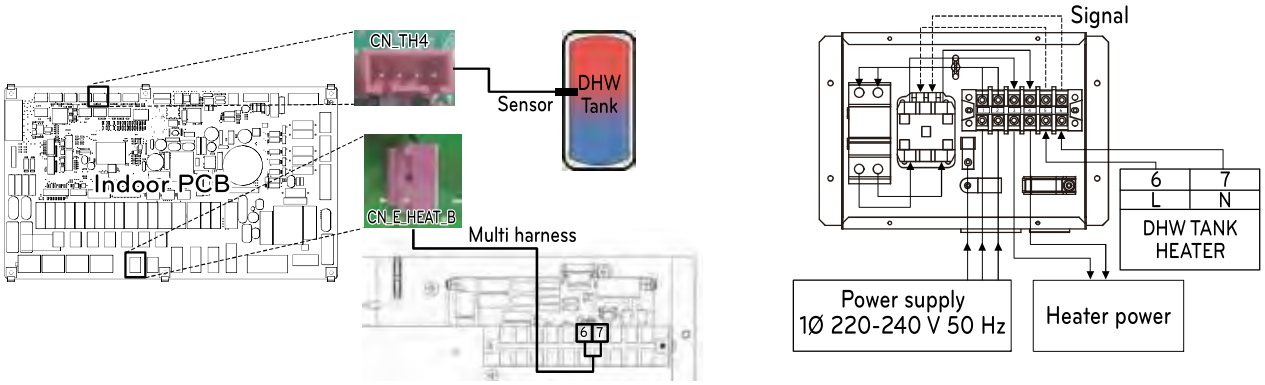


Fig. 1

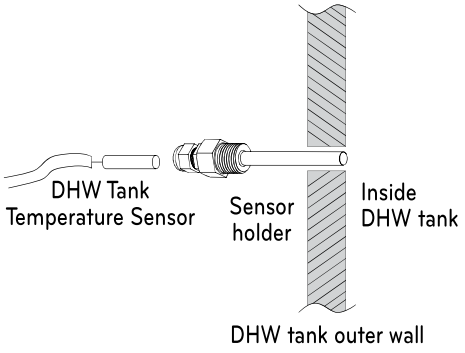


Fig. 2

⚠ CAUTION

Sensor mounting

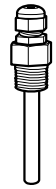
Insert sensor into sensor socket and bolt it tightly.

Solar Thermal Kit

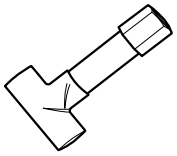
This product can be used by connecting the solar thermal kit in the field. It can be utilized hot water heated by solar thermal system. End-user must be LG AWHP solar thermal kit.

How to Install Solar Thermal Kit

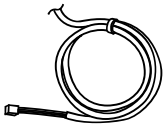
[Parts of Solar Thermal Kit]



Holder sensor



Tube Connector



Solar Thermal Sensor
12 m(1 EA)

Follow below procedures step 1 ~ step 4.

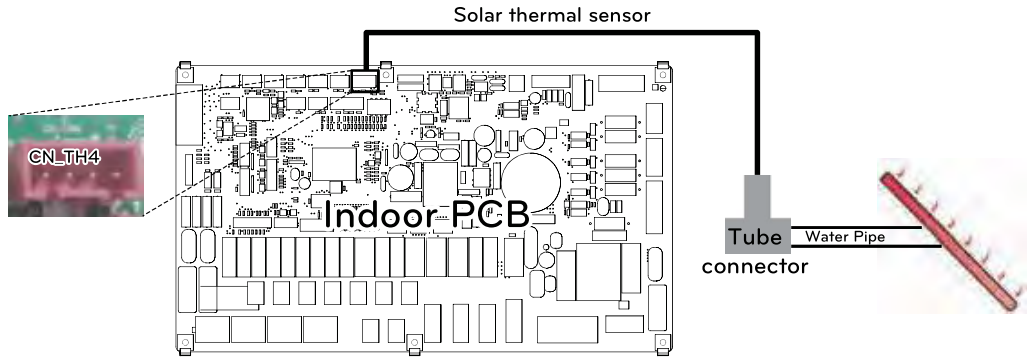
Step 1. Install tube connector(it is necessary to reduce or extend diameter of pipe.) the pipe and solar thermal kit.

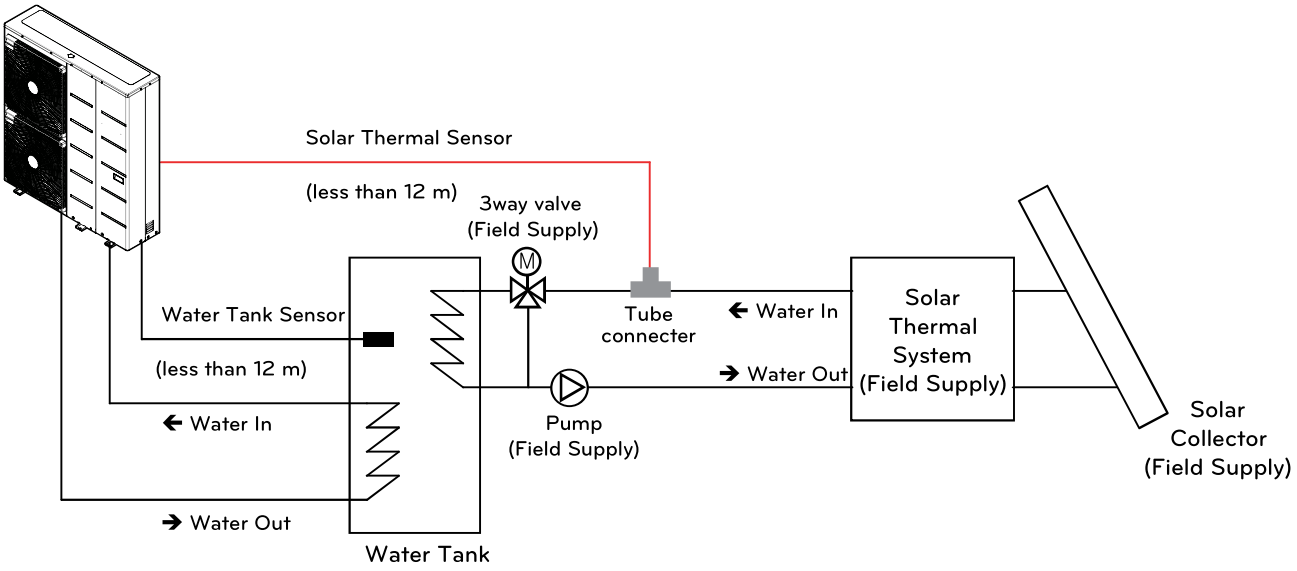
Step 2. Check if the power of the unit is turned off.

Step 3. Disassemble front panels and distinguish control box(Indoor) of the unit.

Step 4. Insert harness into PCB(CN_TH4) fully and fix the thermal sensor into tube connector as shown below.

❊ If the DHW tank sensor is connected, disconnect the sensor from PCB first.





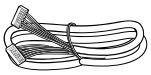
Dry Contact

Dry Contact is a solution for automatic control of HVAC system at the owner's best. In simple words, it's a switch which can be used to turn the unit On/Off after getting the signal from external sources.

How to install dry contact

[Parts of Dry contact]

Dry Contact body



Cable(for connecting with IDU)

Follow below procedures step 1 ~ step 4.

Step 1. Check if the power of the unit is turned off.
Step 2. Disassemble front panels and distinguish terminal block in Indoor PCB.
Step 3. Connect cable to the unit PCB(CN_CC) fully.
Step 4. Then, Insert harness to the dry contact PCB(CN_INDOOR) firmly as shown below.