

External Controller - Setting up programmable digital input operation

If you require to operate control depending on external digital input(ON/OFF), connect cable to indoor PCB(CN_EXT).

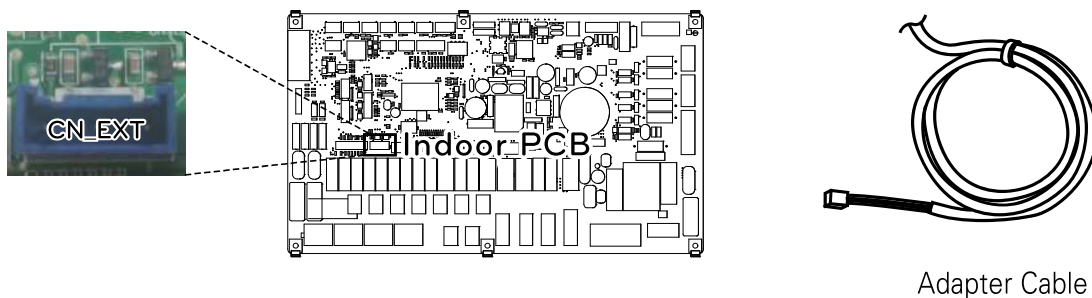
Follow below procedures step 1 ~ step 4.

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

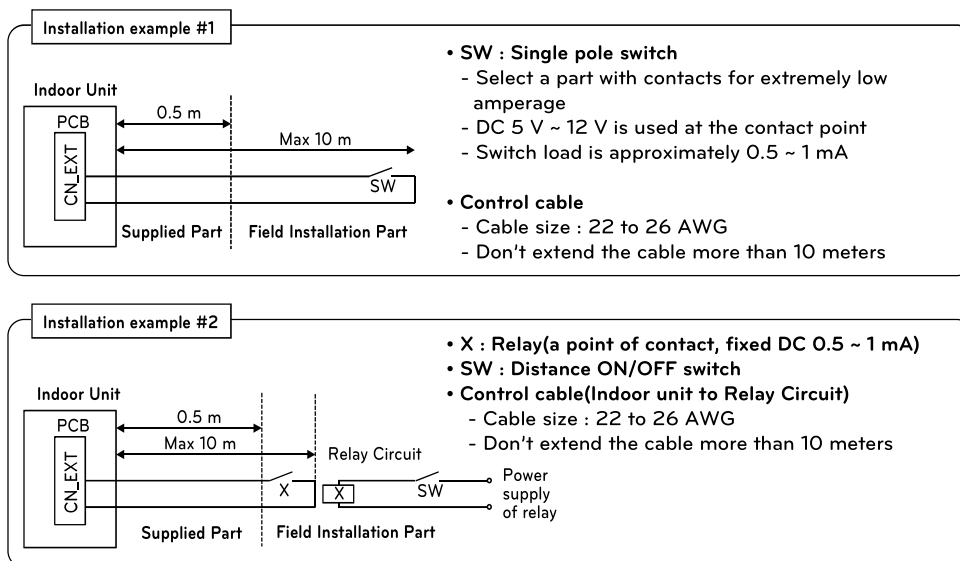
Step 2. Disassemble front panels and distinguish control box(Indoor) of the unit

Step 3. Connect the external controller to PCB(CN_EXT) completely.

Step 4. Connect the cable and field installation part.



Adapter Cable



Determining the purpose of CN_EXT

Setting value: 0 ~ 5 step Indoor CN-EXT port setting

- 0: default
- 1: Simple operation on / off
- 2: Dry contact (simple contact)
- 3: Emergency stop only for indoor unit
- 4: Reattachment / absence
- 5: Emergency stop of all indoor units (It can be set only when indoor unit has emergency stop function)

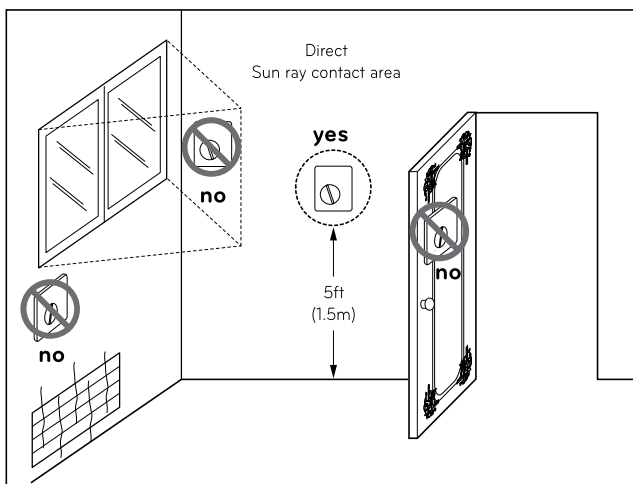
Remote Temperature Sensor

Remote temperature sensor can be installed any place a user wants to detect the temperature.

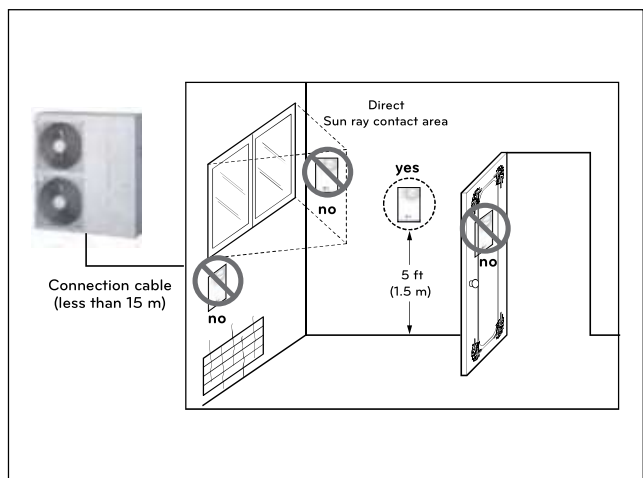
Installation condition

Role and constraint while installation of remote air temperature sensor is very similar to that of thermostat.

- Distance between the unit and the remote air temperature sensor should be less than 15 m due to length of the connection cable of remote air temperature sensor.
- For other constraints, please refer to previous page where constraints about thermostat is described



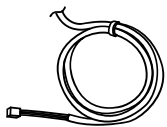
Thermostat



Remote Air Temperature Sensor

How to Install Remote Temperature Sensor

[Parts of Remote Temperature Sensor]



Sensor



Screw(to fix remote sensor)

Follow below procedures step 1 ~ step 5.

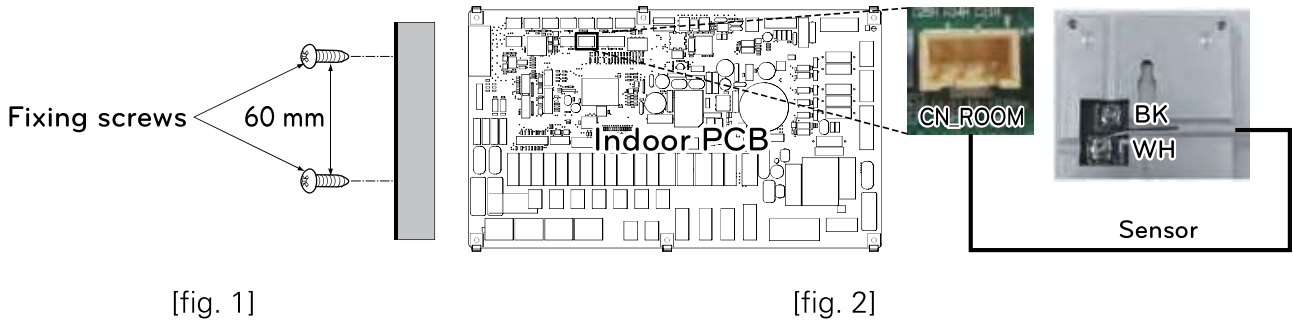
Step 1. Decide where the remote temperature sensor is installed. Then, Determine the location and height of the fixing screws in fig. 1 (Interval between the screws : 60 mm)

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

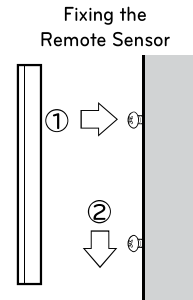
Step 3. Disassemble front panels and distinguish control box(Indoor) of the unit.

Step 4. Insert temperature sensor into PCB(CN_ROOM) and fix the sensor firmly in fig. 2.

Step 5. The Connection wire does not matter if you change the color of the wire because of nonpolar.



Step 6. Integrate the remote temperature sensor with the screws as the order of arrows.



! CAUTION

- Choose the place where the average temperature can be measured for the unit operates.
- Avoid direct sunlight.
- Choose the place where the cooling/heating devices do not affect the remote sensor.
- Choose the place where the outlet of the cooling fan do not affect the remote sensor.
- Choose the place where the remote sensor isn't affected when door is open.

! NOTE

- For more information about installing Remote Temperature Sensor, Please refer installation manual provided with Remote Temperature Sensor.
- For system set-up, please read chapter 8.(Especially function code No.3)

Solar pump

Solar pump can be required to energize water flow when solar thermal system is installed.

How to install solar pump

Follow below procedures step 1 ~ step 4.

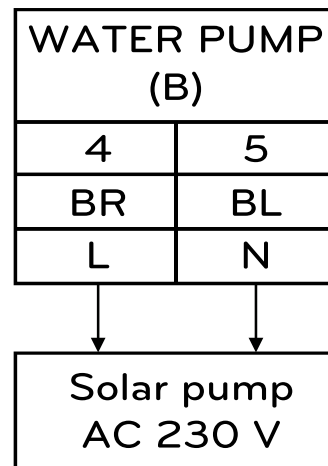
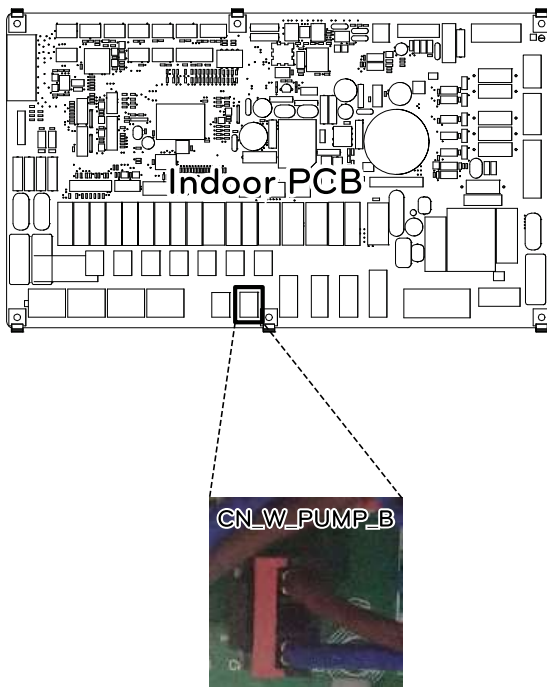
Step 1. Check if the power of the unit is turned off.

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

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

Step 4. Connect the external pump to terminal block 1(4/5).

✳ It is possible to un-use solar pump depending on installation environment.



External pump

External pump can be required when the room to take floor heating is too large or not well-insulated.(potential free) Also, External pump is installed with buffer tank to retain sufficient capacity.

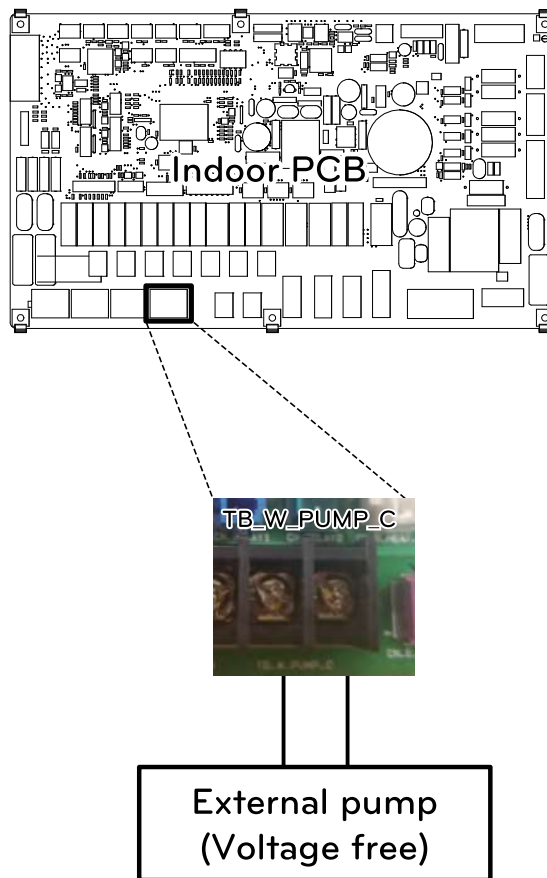
How to install external pump

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 signal cable to terminal block (TB_W_PUMP_C) fully.



Wi-fi Modem

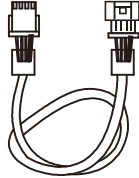
Wi-fi modem enables remote system operation from smartphone. Available functions include selection of on/off, operation mode, DHW heating, temperature setup and weekly scheduling etc.

How to install Wi-fi Modem

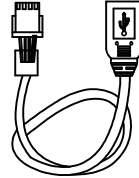
[Parts of Wi-fi modem]



Wi-fi modem body



USB Cable



Extension Cable

Follow below procedures step 1 ~ step 5.

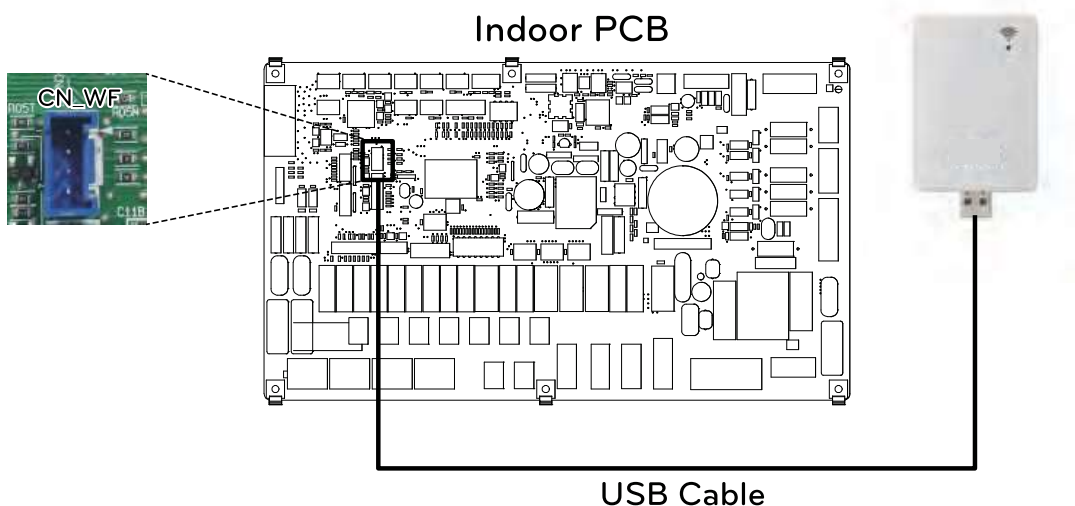
Step 1. Check if the power of the unit is turned off.

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

Step 3. Connect the USB cable to the indoor unit PCB (CN_WF ; Blue) until it clicks into place.

Step 4. Connect the Wi-Fi modem to the USB cable fully.

Step 5. Refer to the image below to install the Wi-Fi modem in the marked position.



Smart Grid

This product provides SG Ready function for users. It enables to stop internal operation(Heating / DHW) and control target temperature depending on input signal from power provider.

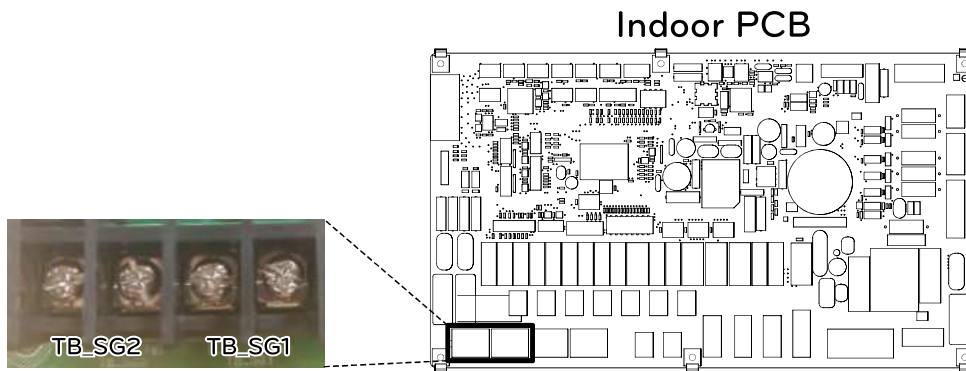
How to install smart grid

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 signal cable to terminal block in PCB (TB_SG2, TB_SG1) fully as shown below.



Heating and DHW Operation depend on input signal(SG1 / SG2)

Status display	Input Signal		Command	Cost (Electric)	Operation	
	SG1	SG2			Heating	Domestic How Water
SGN	Open	Open	Normal Operation	Normal Price	Maintain operation status	Maintain operation status
SG1	Close	Open	Operation Off (Utility lock)	High Price	Forced internal operation off	Forced internal operation off
SG2	Open	Close	Operation On Recommend	Low Price	Target temperature change automatically depend on SG Mode value in installer setting - Step 0 : maintain target temperature - Step 1 : increase 2 °C from target temperature - Step 2 : increase 5 °C from target temperature	Target temperature change automatically depend on SG Mode value in install setting - Step 0 : increase 5 °C from target temperature - Step 1 : increase 5 °C from target temperature - Step 2 : increase 7 °C from target temperature
SG3	Close	Close	Operation On Command	Very Low Price	Maintain operation status	Target temperature change automatically to 80 °C

2Way Valve

2way valve is required to control water flow while cooling operation. Role of 2way valve is to cut off water flow into under floor loop in cooling mode when fan coil unit is equipped for cooling operation.

General Information

THERMAV™ supports following 2way valve.

Type	Power	Operating Mode	Supported
NO 2-wire (1)	230 V AC	Closing water flow	Yes
		Opening water flow	Yes
NC 2-wire (2)	230 V AC	Closing water flow	Yes
		Opening water flow	Yes

(1) : Normal Open type. When electric power is NOT supplied, the valve is open. (When electric power is supplied, the valve is closed.)

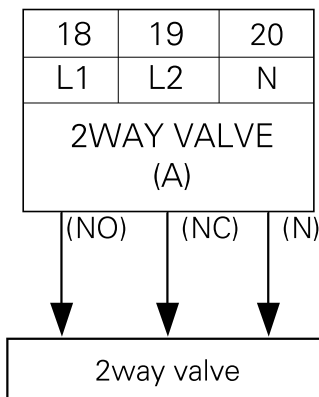
(2) : Normal Closed type. When electric power is NOT supplied, the valve is closed. (When electric power is supplied, the valve is open.)

How to Wire 2Way Valve

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.



⚠ CAUTION

Dew Condensation

- Wrong wiring can yield dew condensation on the floor. If radiator is connected at the under floor water loop, dew condensation can be occurred on the surface of the radiator.

⚠ WARNING

Wiring

- Normal Open type should be connected to wire (NO) and wire (N) for valve opening in cooling mode.
- Normal closed type should be connected to wire (NC) and wire (N) for valve closing in cooling mode.

(NO) : Live signal (for Normal Open type) from PCB to 2way valve

(NC) : Live signal (for Normal Closed type) from PCB to 2way valve

(N) : Neutral signal from PCB to 2way valve

Final Check

- Flow direction :
 - Water should not flow into under floor loop in cooling mode.
 - To verify the flow direction, check temperature at the water inlet of the under floor loop.
 - If correctly wired, this temperatures should not be approached to 6 °C in cooling mode.

3Way Valve(A)

3Way Valve(A) is required to operate DHW water tank. Role of 3way valve is flow switching between under floor heating loop and water tank heating loop.

Plus, it is required to operate 3rd party boiler.

General Information

THERMAV supports following 3way valve.

Type	Power	Operating Mode	Supported
SPDT 3-wire (1)	220-240 V~	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.'

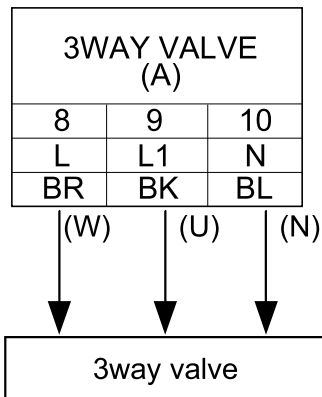
(3) : Flow B means 'water flow from the unit to DHW water tank.'

How to wire 3way valve(A)

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.



! WARNING

- 3way valve should select water tank loop when electric power is supplied to wire (W) and wire (N).
- 3way valve should select under floor loop when electric power is supplied to wire (U) and wire (N).

(W) : Live signal (Water tank heating) from PCB to 3way valve

(U) : Live signal (Under floor heating) from PCB to 3way valve

(N) : Neutral signal from PCB to 3way valve

3Way Valve(B)

3way valve(B) is required to operate Solar thermal system. Role of 3way valve is flow switching between open and close mode of the solar circuit.

General Information

THERMAV supports following 3way valve.

Type	Power	Operating Mode	Supported
SPDT 3-wire (1)	220-240 V~	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 B means 'heat source toward solar panel repeatedly'. (close mode of circuit)

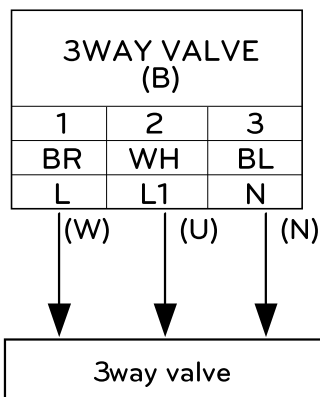
(3) : Flow A means 'heat source flow from solar panel to DHW tank in solar circuit'.
(open mode of circuit)

How to wire 3way valve(B)

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.



! WARNING

- 3way valve should select "close solar circuit" when electric power is supplied to wire (W) and wire (N).
- 3way valve should select "open solar circuit" when electric power is supplied to wire (U) and wire (N).

(W) : Live signal (close solar circuit) from PCB to 3way valve

(U) : Live signal (open solar circuit) from PCB to 3way valve

(N) : Neutral signal from PCB to 3way valve

Electric Heater

How to Pipe Electric Heater

Follow below procedures Step 1 ~ Step 4.

Step 1. Uncover the electric heater accessory.

Step 2. Check the diameter of pre-installed pipes of unit.

Step 3. If the diameter of pre-installed pipes is different from diameter of electric heater accessory kit, it is necessary to reduce or expand pipe's diameter.

Step 4. Connect the pipes. The inlet pipe of electric heater accessory must be connected to outlet of the unit.

! WARNING

Followings should be kept before installation

- The unit should be stop before the piping work.
- Never connect electric power while piping electric heater.
- Before the piping working, water in the part(or to heating loop) installed with electric heater should be drained. After working, water should be charged.

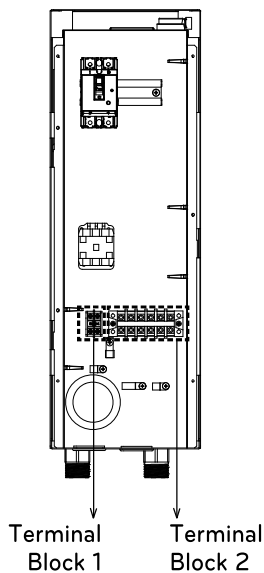
! CAUTION

- Electric Heater should be installed with enough space for installation and service.
- Water pipes and connections should be cleaned using water.
- Methods to prevent leakage in plumbing connections must be applied.
- Heater must not be impacted.
- Do not let dirty particle be dropped inside tank to avoid possibility of degrade.
- After installation, make it sure that no leakage is appeared in the connection.

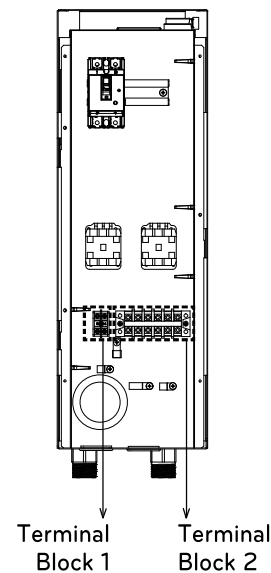
Terminal Block Information

Symbols used below pictures are as follows :

- L, L1, L2 : Live (220-240 V~)
- N : Neutral (220-240 V~)
- BR : Brown , WH : White , BL : Blue , BK : Black



< 3 kW >



< 6 kW >

How to Wire Electric Heater

Follow below procedures Step 1 ~ Step 4.

Step 1. Uncover the electric heater accessory.

Step 2. Find the terminal block and connect wires. Refer to the installation manual of the electric heater. (Wires are field-supplied item.)

Step 3. Connect terminal block ports unit and electric heater accessory.

- HAETER(A) : Signal to activate 1st step
- HEATER(B) : Signal to activate 2nd step

(3 kW)

Terminal Block 2 (In Backup Heater)

1(L)	2(N)	3	4	5	6
L	N	A(A1)	A(A2)		
Power Supply 50 Hz 220-240 V~		ELECTRIC HEATER A (SIGNAL)			

23	24	25	26
BR	BL	BR	BL
L	N	L	N
HEATER (A)		HEATER (B)	

Terminal Block 3 (In Unit)

(6 kW)

Terminal Block 2 (In Backup Heater)

1(L)	2(N)	3	4	5	6
L	N	A(A1)	A(A2)	B(A1)	B(A2)
Power Supply 50 Hz 220-240 V~		ELECTRIC HEATER A (SIGNAL)		ELECTRIC HEATER B (SIGNAL)	

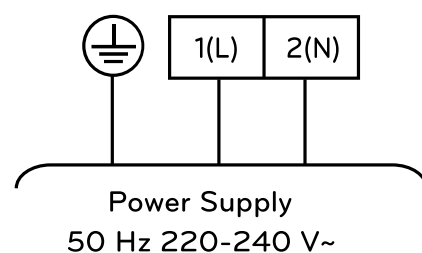
23	24	25	26
BR	BL	BR	BL
L	N	L	N
HEATER (A)		HEATER (B)	

Terminal Block 3 (In Unit)

Step 4. Connect power supply cable to terminal block 2.

When Tightening the power cable on terminal block, Be careful to prevent a shock or injury. (AC 220-240 V signal)

Terminal Block 2 (In Backup Heater)



- For more information about installing Electric Heater, Please refer installation Manual provided with Electric Heater

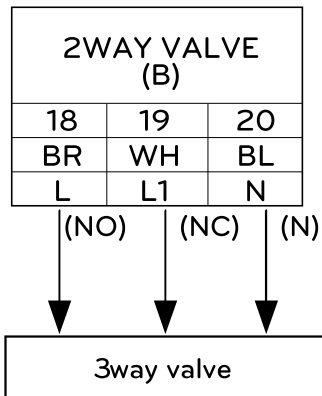
How to Install 3way Valve for Backup Heater Bypass

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.

When Tightening the connect wire on terminal block, Be careful to prevent a shock or injury. (230 VAC)



! WARNING

- When type of 2way valve is NO type, 3way valve should select Flow A(bypass). Electric power is supplied to wire(NO) and wire(N).
- When type of 2way valve is NC type, 3way valve should select Flow B(heating In Backup heater). Electric power is supplied to wire(NC) and wire(N).

! CAUTION

- 3way valve should be connected together with 2way valve in terminal block.
- Keep the distance between 3way valve and Backup Heater more than 0.5m.
- To prevent reverse flow, It is important to use one way valve(check valve) to Backup Heater water outlet.

How to Connect Backup Heater Sensor to Unit

Follow below procedures Step 1 – Step 5.

- ① Find backup heater terminal block Kit(Fig. 1).
- ② Assemble the terminal block kit using screw on unit.(referring to 40 page)
- ③ Plug it to 'E/Heater Out' (White Connector) of CN_TH3 in the Main PCB (Unit) as shown Fig.2.
- ④ Connect harness between the unit and the Backup Heater until it clicks into place.(Fig. 3).
- ⑤ Use the cord clamer to fix the cable through low voltage hole.

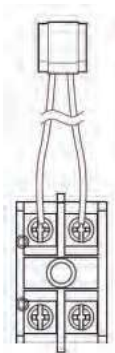


Fig.1

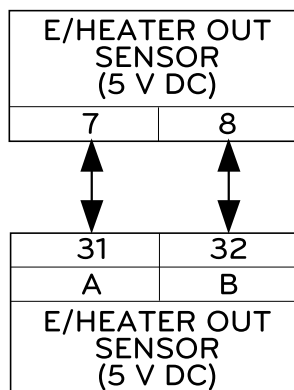


Fig.2

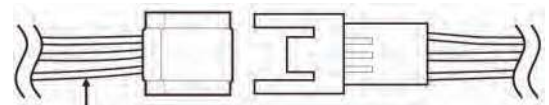


Fig.3

Final check

No.	Check point	Description
1	Connection of Water Inlet/Outlet	<ul style="list-style-type: none"> - Check if the shut-off valves should be assembled with Water inlet and outlet pipe of the unit - Check the location of the water inlet/outlet water pipe
2	Hydraulic pressure	<ul style="list-style-type: none"> - Check the pressure of supplying water by using pressure gage inside the unit - Pressure of Supplying water should be Under 3.0 bar approximately
3	Water pump capacity	<ul style="list-style-type: none"> - To secure enough water flow rate, do not set water pump capacity as Minimum. - It can lead unexpected flow rate error CH14. (Refer to Chapter 4 'Water Piping and Water Circuit Connection')
4	Transmission line and power source wiring	<ul style="list-style-type: none"> - Check if Transmission line and power source wiring are separated from each other. - If it is not, electronic noise may occur from the power source.
5	The power cord specifications	<ul style="list-style-type: none"> - Check the power cord specifications (Refer to Chapter 4 'Connecting Cables')
6	3Way Valve	<ul style="list-style-type: none"> - Water should flow from Water outlet of the unit to DHW tank Water inlet when DHW tank heating is selected. - To verify the flow direction, Make sure that the water outlet temperature of the unit and water inlet temperature of DHW Water tank are similar
7	2Way Valve	<ul style="list-style-type: none"> - Water should not flow into under floor loop in cooling mode. - To verify the flow direction, check temperature at the water inlet of the under floor loop. - If correctly wired, this temperatures should not be approached to 6 °C in cooling mode.
8	Air Vent	<ul style="list-style-type: none"> - Air-vent must be located highest level of Water pipe system - It should be installed at the point which is easy to service. - It takes some times to remove air in the water system if air purge is not performed sufficiently it may occur CH14 error. (refer to Chapter 4 'Water Charging')