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INSTALLATION MANUAL

AIR-TO-WATER HEAT PUMP

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.

THERMA V

Original instruction

MFL68681810
Rev.20_083121

www.lg.com

ENGLISH

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PREFACE

This installation manual is to present information and guide about understanding, installing, and checking THERMA V.
Your careful reading before installation is highly appreciated to make no mistake and to prevent potential risks. The manual is divided into ten chapters. These chapters are classified according to installation procedure. See the table below to get summarized information.

Chapters	Contents
Chapter 1	• Warning and Caution concerned with safety. • This chapter is directly related with human safety. We strongly recommend reading this chapter carefully.
Chapter 2	• Items Inside product Box • Before starting installation, please make it sure that all parts are found inside the product box.
Chapter 3	• Fundamental knowledge about THERMA V. • Model identification, accessories information, refrigerant and water cycle diagram, parts and dimensions, electrical wiring diagrams, etc. • This chapter is important to understand THERMA V.
Chapter 4	• Installation about the outdoor unit. • Installation location, constraints on installation site, etc
Chapter 5	• Installation about the indoor unit. • Installation location, constraints on installation site, etc • Constrains when accessories are installed
Chapter 6	• How to perform piping (for refrigerant) and wiring at the outdoor unit. • Refrigerant pipe connection between the indoor unit and the outdoor unit. • Electrical wiring at the outdoor unit.
Chapter 7	• How to perform piping (for water) and wiring at the indoor unit. • Water pipe connection between the indoor unit and pre-built under floor water loop pipe. • Electrical wiring at the indoor unit. • System set-up and configuration. • As many control parameters of THERMA V. is adjustable by control panel, deep understanding about this chapter is required to secure the operation flexibility of THERMA V. • For more detailed information, please read the separate operation manual to use control panel and adjust control parameters.
Chapter 8	• Information about supported accessories • Specification, Constraints, and wiring are described. • Before purchasing accessories, please find supported specification to buy proper one.
Chapter 9	• Test operation and check point while test running.
Chapter 10	• Check points before starting operation are explained. • Troubleshooting, maintenance, and error code list are presented to correct problems.

REMARK : ALL CONTENTS OF THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.
TO GET THE LATEST INFORMATION, PLEASE VISIT LG ELECTRONICS WEB SITE.

* The feature may be vary according to the type of model.

SAFETY INSTRUCTIONS

	Read the precautions in this manual carefully before operating the unit.		This appliance is filled with flammable refrigerant (R32)
	This symbol indicates that the Operation Manual should be read carefully.		This symbol indicates that a service personnel should be handling this equipment with reference to the Installation Manual.

The following safety guidelines are intended to prevent unforeseen risks or damage from unsafe or incorrect operation of the appliance. The guidelines are separated into 'WARNING' and 'CAUTION' as described below.

⚠ This symbol is displayed to indicate matters and operations that can cause risk. Read the part with this symbol carefully and follow the instructions in order to avoid risk.

⚠ WARNING

This indicates that the failure to follow the instructions can cause serious injury or death.

⚠ CAUTION

This indicates that the failure to follow the instructions can cause the minor injury or damage to the product.

⚠ WARNING

Installation

- Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.
  - There is risk of fire or electric shock.
- For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.
  - There is risk of fire or electric shock.

- Always ground the unit.
  - There is risk of fire or electric shock.
- Install the panel and the cover of control box securely.
  - There is risk of fire or electric shock.
- Always install a dedicated circuit and breaker.
  - Improper wiring or installation may cause fire or electric shock.
- Use the correctly rated breaker or fuse.
  - There is risk of fire or electric.
- Do not modify or extend the power cable.
  - There is risk of fire or electric shock.
- Do not install, remove, or reinstall the unit by yourself (customer).
  - There is risk of fire, electric shock, explosion, or injury
- For antifreeze, always contact the dealer or an authorized service center.
  - Almost the antifreeze is a toxic product.
- For installation, always contact the dealer or an authorized Service Center.
  - There is risk of fire, electric shock, explosion, or injury.
- Do not install the unit on a defective installation stand.
  - It may cause injury, accident, or damage to the unit.
- Be sure the installation area does not deteriorate with age.
  - If the base collapses, the unit could fall with it, causing property damage, unit failure, and personal injury.
- Do not install the water pipe system as Open loop type.
  - It may cause failure of unit.
- Use a vacuum pump or inert (nitrogen) gas when doing leakage test or purging air. Do not compress air or oxygen and do not use flammable gases.
  - There is the risk of death, injury, fire or explosion.
- Make sure the connected condition of connector in product after maintenance.
  - Otherwise, it may cause product damage.

- Do not touch leaked refrigerant directly.
  - There is risk of frostbite.
- Copper in contact with refrigerants shall be oxygen-free or deoxidized, for example Cu-DHP as specified in EN 12735-1 and EN 12735-2.
- Compliance with national gas regulations shall be observed. (for R32)
- Refrigerant tubing shall be protected or enclosed to avoid damage. (for R32)
- The installation of pipe-work shall be kept to a minimum. (for R32)
- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part. (for R32)
- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification. (for R32)
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. (for R32)
- Do not pierce or burn. (for R32)
- Be aware that refrigerants may not contain an odour. (for R32)
- Dismantling the unit, treatment of the refrigerant oil and eventual parts should be done in accordance with local and national standards. (for R32)
- Flexible refrigerant connectors (such as connecting lines between the indoor and outdoor unit) that may be displaced during normal operations shall be protected against mechanical damage. (for R32)

- Pipe-work shall be protected from physical damage. (for R32)
- Mechanical connections (mechanical connectors or flared joints) shall be accessible for maintenance purposes. (for R32)

Operation

- Take care to ensure that power cable could not be pulled out or damaged during operation.
  - There is risk of fire or electric shock.
- Do not place anything on the power cable.
  - There is risk of fire or electric shock.
- Do not plug or unplug the power supply plug during operation.
  - There is risk of fire or electric shock.
- Do not touch (operate) the unit with wet hands.
  - There is risk of fire or electric shock.
- Do not place a heater or other appliances near the power cable.
  - There is risk of fire or electric shock.
- Do not allow water to run into electric parts.
  - There is risk of fire, failure of the unit, or electric shock.
- Do not store or use flammable gas or combustibles near the unit.
  - There is risk of fire or failure of unit.
- Do not use the unit in a tightly closed space for a long time.
  - It may cause damage to the unit.
- When flammable gas leaks, turn off the gas and open a window for ventilation before turning the unit on.
  - There is risk of explosion or fire.
- If strange sounds, or smell or smoke comes from unit, turn the breaker off or disconnect the power supply cable.
  - There is risk of electric shock or fire.

- Stop operation and close the window in storm or hurricane. If possible, remove the unit from the window before the hurricane arrives.
  - There is risk of property damage, failure of unit, or electric shock.
- Do not open the front cover of the unit while operation. (Do not touch the electrostatic filter, if the unit is so equipped.)
  - There is risk of physical injury, electric shock, or unit failure.
- Do not touch any electric part with wet hands. you should be power off before touching electric part.
  - There is risk of electric shock or fire.
- Do not touch refrigerant pipe and water pipe or any internal parts while the unit is operating or immediately after operation.
  - There is risk of burns or frostbite, personal injury.
- If you touch the pipe or internal parts, you should be wear protection or wait time to return to normal temperature.
  - Otherwise , it may cause burns or frostbite, personal injury.
- Turn the main power on 6 hours ago before the product starting operation.
  - Otherwise, it may cause compressor damage.
- Do not touch electric parts for 10 minutes after main power off.
  - There is risk of physical injury, electric shock.
- The inside heater of product may operate during stop mode. It is intended to protect the product.
- Be careful that some part of the control box are hot.
  - There is risk of physical injury or burns.
- When the unit is soaked (flooded or submerged), contact an Authorized Service Center.
  - There is risk of fire or electric shock.
- Be cautious that water could not be poured to the unit directly.
  - There is risk of fire, electric shock, or unit damage.

- Ventilate the unit from time to time when operating it together with a stove, etc.
  - There is risk of fire or electric shock.
- Turn the main power off when cleaning or maintaining the unit.
  - There is risk of electric shock.
- Take care to ensure that nobody could step on or fall onto the unit.
  - This could result in personal injury and unit damage.
- If the unit is not used for long time, we strongly recommend not to switch off the power supply to the unit.
  - There is risk of water freezing.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation. (for R32)
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater). (for R32)
- The appliance shall be stored so as to prevent mechanical damage from occurring. (for R32)
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants. (for R32)
- When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated. (for R32)
- Periodic(more than once/year) cleaning of the dust or salt particles stuck on the heat exchangers by using water. (for R32)
- Keep any required ventilation openings clear of obstruction. (for R32)

⚠ CAUTION

Installation

- Always check for gas (refrigerant) leakage after installation or repair of unit.
  - Low refrigerant levels may cause failure of unit.
- Keep level even when installing the unit.
  - To avoid vibration or water leakage.
- Use two or more people to lift and transport the unit.
  - Avoid personal injury.
- Do not install the unit in potentially explosive atmospheres.
- Connect the water for filling or refilling the heating system as specified by EN 1717/EN 61770 to avoid contamination of drinking water by return flow.

Operation

- Do not use the unit for special purposes, such as preserving foods, works of art, etc.
  - There is risk of damage or loss of property.
- Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.
  - There is risk of fire, electric shock, or damage to the plastic parts of the unit.
- Do not step on or put anything on the unit.
  - There is risk of personal injury and failure of unit.
- Use a firm stool or ladder when cleaning or maintaining the unit.
  - Be careful and avoid personal injury.
- Do not turn on the breaker or power under condition that front panel cabinet, top cover, control box cover are removed or opened.
  - Otherwise it may cause fire, electric shock, explosion or death.

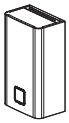
- The appliance shall be disconnected from its power source during service and when replacing parts.
- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- The Installation kit supplied with the appliance are to be used and that old Installation kit should not be reused.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. Installation work must be performed in accordance with the national wiring standards by authorized personnel only.
- This equipment shall be provided with a supply conductor complying with the national regulation.
- The instructions for service to be done by specialized personnel, mandated by the manufacturer or the authorized representative may be supplied in only one Community language which the specialized personnel understand.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

INSTALLATION PART

Thank you for choosing LG Electronics Air-to-Water Heat Pump THERMA V.
Before starting installation, please make it sure that all parts are found inside the product box.

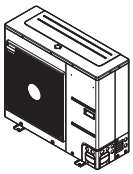
(For Split)

INDOOR UNIT BOX

Item	Image	Quantity
Indoor unit		1
Installation Manual		1
Owner's / Installation manual		1

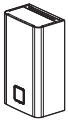
Item	Image	Quantity
Shut-off valve		2
Installation Sheet		1

OUTDOOR UNIT BOX

Item	Image	Quantity
Outdoor Unit U36A Chassis		1
Outdoor Unit U60A Chassis		1
Drain Cap		4
Drain Nipple		1
Damper		4

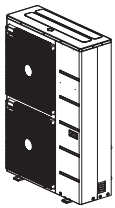
(For Hydrosplit)

INDOOR UNIT BOX

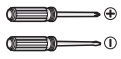
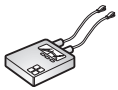
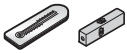
Item	Image	Quantity
Indoor unit		1

Item	Image	Quantity
Installation Sheet		1

OUTDOOR UNIT BOX

Item	Image	Quantity
Outdoor Unit U60A Chassis		1
Drain Cap		4
Drain Nipple		1
Installation Manual		1
Owner's / Installation manual		1
Strainer		1
Damper		4

INSTALLATION TOOLS

Figure	Name	Figure	Name
	Screw driver		Ohmmeter
	Electric drill		Hexagonal wrench
	Measuring tape, Knife		Ammeter
	Hole core drill		Leak detector
	Spanner		Thermometer, Horizontal meter
	Torque wrench		Flaring tool set
	Manifold Gauge		Vacuum Pump
	Pliers	-	-

GENERAL INFORMATION

With advanced inverter technology, THERMA V is suitable for applications like under floor heating, under floor cooling, and hot water generation. By Interfacing to various accessories user can customize the range of the application.

In this chapter, general information of THERMA V is presented to identify the installation procedure. Before beginning installation, read this chapter carefully and find helpful information on installation.

Energy Labels and Product Fiches for all possible combinations can be found at https://www.lg.com/global/support/cedoc/cedoc. Search for outdoor unit name in cedoc page.

Model Information

Factory Model Name

Outdoor unit

Model	No.						
	1	2	3	4	5	6	7
Split	ZH	U	W	09	6	A	0
Hydrosplit	ZH	B	W	16	8	B	0

	Signification
1	ZH : Air-to-Water-Heat Pump for R32 AH : Air-to-Water-Heat Pump for R410A
2	Classification - U : Outdoor unit of Split - B : Outdoor unit of Hydrosplit
3	Model Type - W : Inverter Heat Pump
4	Heating Capacity - e.g. 09 : 9 kW
5	Electrical ratings - 6 : 1Ø, 220-240V, 50 Hz - 8 : 3Ø, 380-415V, 50 Hz
6	Function - A : General function of Split - B : General function of Hydrosplit
7	Series number (Factory)

Indoor unit

Model	No.							
	1	2	3	4	5	6	7	8
Split	ZH	N	W	09	6	06	A	1
Hydrosplit	ZH	N	W	16	·	·	B	0

	Signification
1	ZH : Air-to-Water-Heat Pump for R32 AH : Air-to-Water-Heat Pump for R410A
2	Classification - N : Indoor unit
3	Model Type - W : Inverter Heat Pump
4	Heating Capacity - e.g. 09 : 9 kW
5	Electrical ratings - 6 : 1Ø, 220-240V, 50 Hz - 8 : 3Ø, 380-415V, 50 Hz
6	Heater Capacity - e.g. 06 : 6 kW Heater
7	Function - A : General function of Split - B : General function of Hydrosplit 1-Pipe - C : General function of Hydrosplit 2-Pipe
8	Series number (Factory)

Buyer Model Name

Outdoor unit

Type	Refrigerant	No.								
		1	2	3	4	5	6	7	8	9
Split	R410A	H	U	16	1	·	·	·	U3	3
		H	U	16	1	M	A	·	U3	3
	R32	H	U	05	1	M	R	·	U4	4
Hydrosplit	R32	H	U	16	3	M	R	B	U3	0

	Signification
1	Air-to-Water Heat Pump
2	Classification - U : Outdoor unit
3	Heating Capacity - e.g. 16 : 16 kW
4	Electrical ratings - 1 : 1Ø, 220-240V, 50 Hz - 3 : 3Ø, 380-415V, 50 Hz
5	Leaving water combination - M : Medium Temperature
6	Refrigerant - A : R410A - R : R32
7	Function - B : General function of Hydrosplit
8	Chassis - U3 : U60A Chassis - U4 : U36A Chassis
9	Series number (Buyer) - HU*** U33 : Split R410A 3 Series - HU***MA U33 : Split R410A 4 Series - HU***MR U44 : Split R32 4 Series - HU***MRB U30 : Hydrosplit 0 Series

Indoor unit

Type	Refrigerant	No.									
		1	2	3	4	5	6	7	8	9	10
Split	R410A	H	N	16	1	6	·	·	·	NK	3
		H	N	16	1	6	M	·	·	NK	5
	R32	H	N	09	1	6	M	·	·	NK	4
		H	N	09	1	·	M	R	·	NK	5
Hydrosplit	R32	H	N	16	0	0	M	·	B	NK	0

	Signification
1	Air-to-Water Heat Pump
2	Classification - N : Indoor unit
3	Heating Capacity - e.g. 09 : 9 kW
4	Electrical ratings - 0 : For both 1Ø, 220-240V, 50 Hz and 3Ø, 380-415 V, 50 Hz - 1 : 1Ø, 220-240V, 50 Hz - 3 : 3Ø, 380-415V, 50 Hz
5	Heater capacity (kW) - 0 : Optional Accessory - 6 : 6 kW Heater - 9 : 9 kW Heater * For R32 5 Series : 6 kW Heater
6	Leaving water combination - M : Medium Temperature
7	Refrigerant - R : R32
8	Function - B : General function of Hydrosplit 1-Pipe - C : General function of Hydrosplit 2-Pipe
9	Chassis - NK : K1 Chassis
10	Series number (Buyer) - 0 : 0 Series - 1 : 1 Series

Check the model information based on the buyer model series number.
(e.g., geometry, cycle, etc.)

Related Information

Unit												
Heat Pump											Backup Heater	
Type	Refrigerant	Outdoor Unit			Indoor Unit			Power Supply	Capacity		Capacity [kW]	Power Supply
		Series	Phase	Capacity [kW]	Series	Phase	Capacity [kW]		Heating [kW]*1	Cooling [kW]*2		
Split	R32	0	1Ø	5	4	1Ø	9	220-240 V~50 Hz	5.5	5.5	6 (3+3)	220-240 V~50 Hz
					5							
				7	4				7.0	7.0		
					5							
				9	4				9.0	9.0		
					5							
	R410A	3	1Ø	5	3	1Ø	16	220-240 V~50 Hz	5.0	5.0	6 (3+3)	220-240 V~50 Hz
				7	3				7.0	7.0		
				9	3				9.0	9.0		
				12	3				12.0	10.4		
					5							
				14	3				14.0	12.0		
					5							
				16	3				16.0	13.0		
					5							
		4		12	3				12.0	10.4		
					5							
				14	3				14.0	12.0		
					5							
				16	3				16.0	13.0		
					5							
		3	3Ø	12	3	3Ø		380-415 V~50 Hz	12.0	10.4	9 (3+3+3)	380-415 V~50 Hz
					5						6 (2+2+2)	
				14	3				14.0	12.0	9 (3+3+3)	
					5						6 (2+2+2)	
				16	3				16.0	13.0	9 (3+3+3)	
					5						6 (2+2+2)	
		4		12	3				12.0	10.4	9 (3+3+3)	
					5						6 (2+2+2)	
				14	3				14.0	12.0	9 (3+3+3)	
					5						6 (2+2+2)	
				16	3				16.0	13.0	9 (3+3+3)	
					5						6 (2+2+2)	
Hydrosplit	R32	0	1Ø	12	0	1Ø	16	220-240 V~50 Hz	12.0	12.0	-	-
				14					14.0	14.0		
				16					16.0	16.0		
			3Ø	12		3Ø		380-415 V~50 Hz	12.0	12.0		
				14					14.0	14.0		
				16					16.0	16.0		

*1 : tested under EN14511
(water temperature 30 °C → 35 °C at outdoor ambient temperature 7 °C / 6 °C)

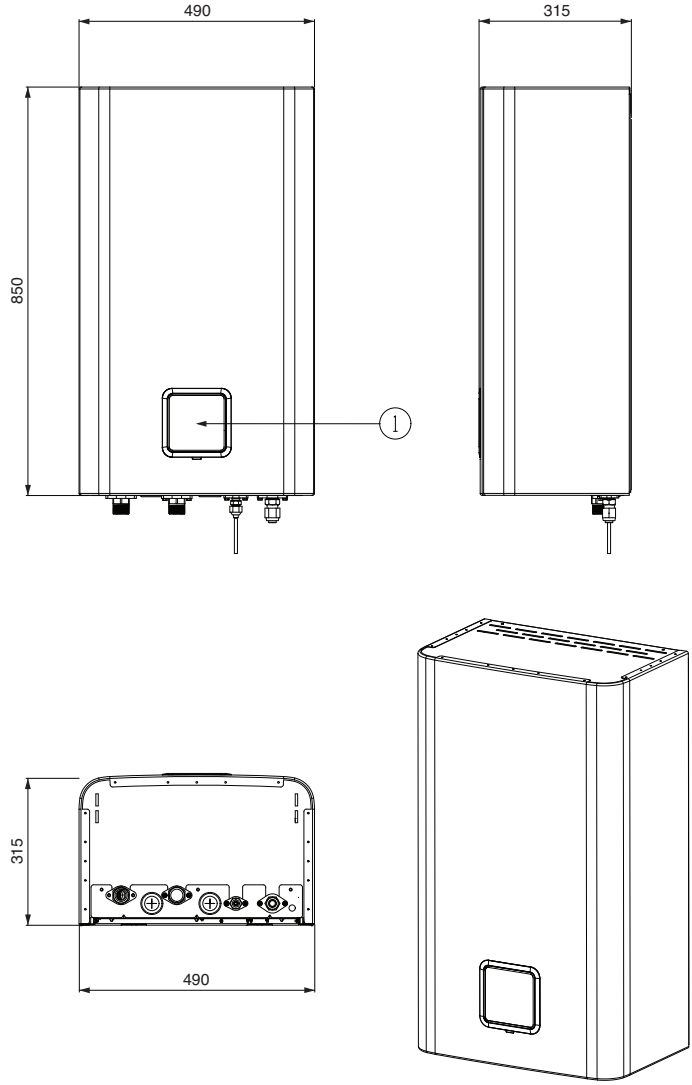
*2 : tested under EN14511
(water temperature 23 °C → 18 °C at outdoor ambient temperature 35 °C / 24 °C)

❇ All appliances were tested at atmospheric pressure.

Parts and Dimensions

Indoor unit : External

(unit : mm)



* The feature may be vary according to the type of model.

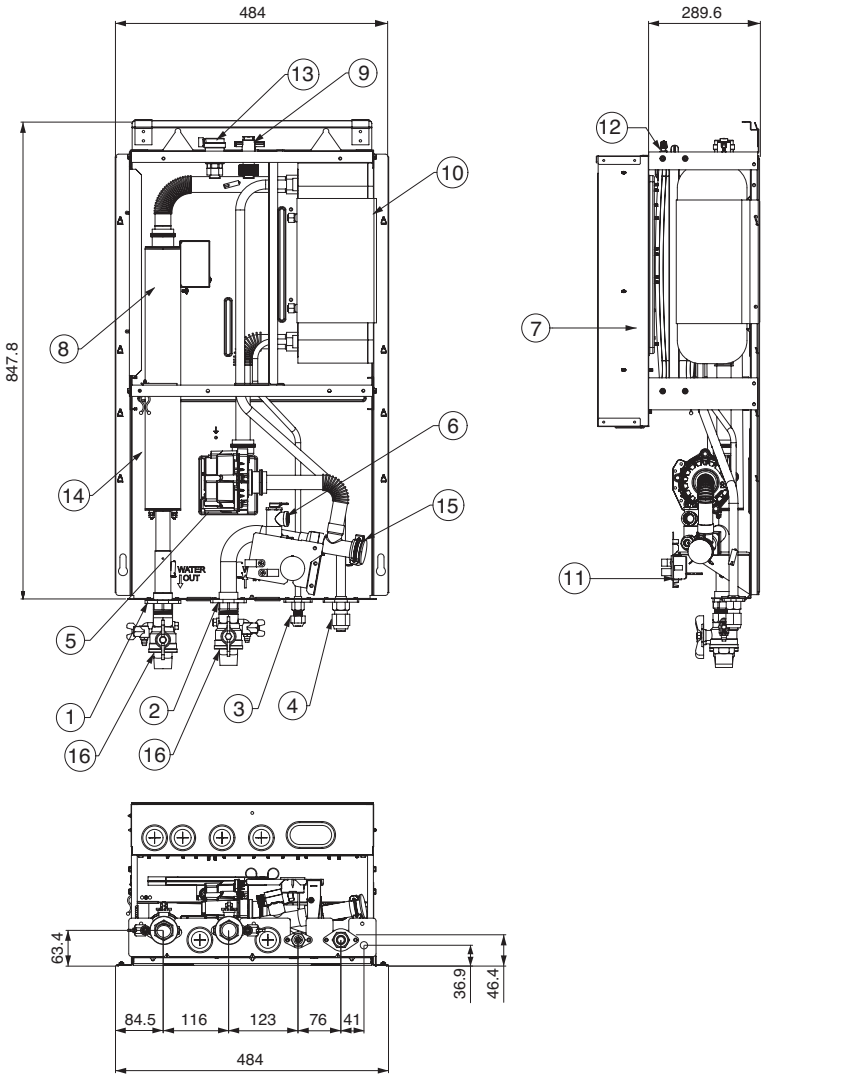
Description

No	Name	Remark
1	Control Panel	Built-in Remote Controller

Indoor unit : Internal

- For Split R410A Indoor unit 3 Series

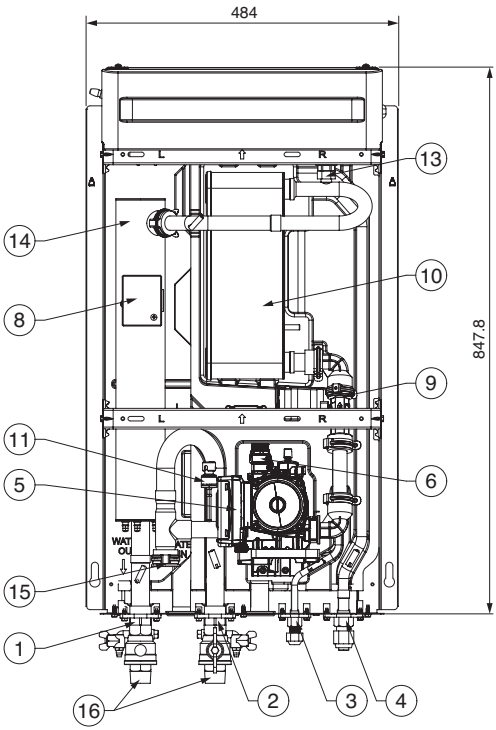
(unit : mm)

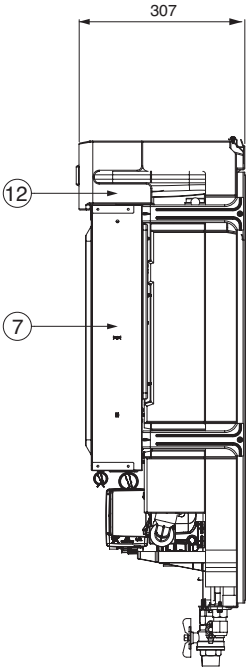


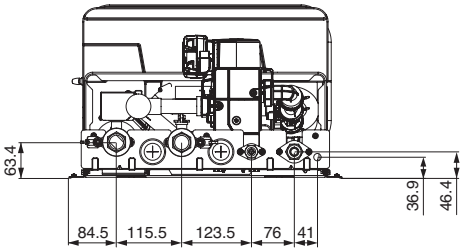
Indoor unit : Internal

- For Split R410A Indoor unit 5 Series

(unit : mm)



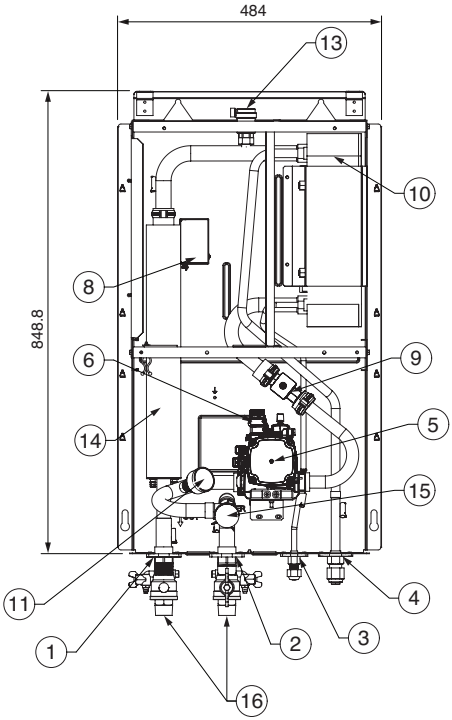


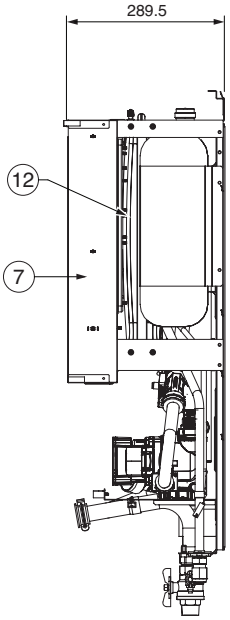


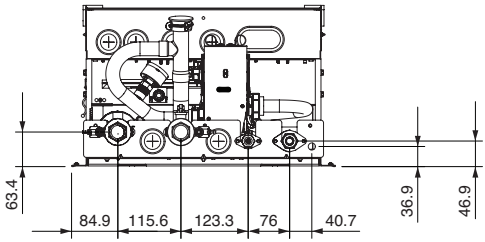
Indoor unit : Internal

- For Split R32 Indoor unit 4 Series

(unit : mm)



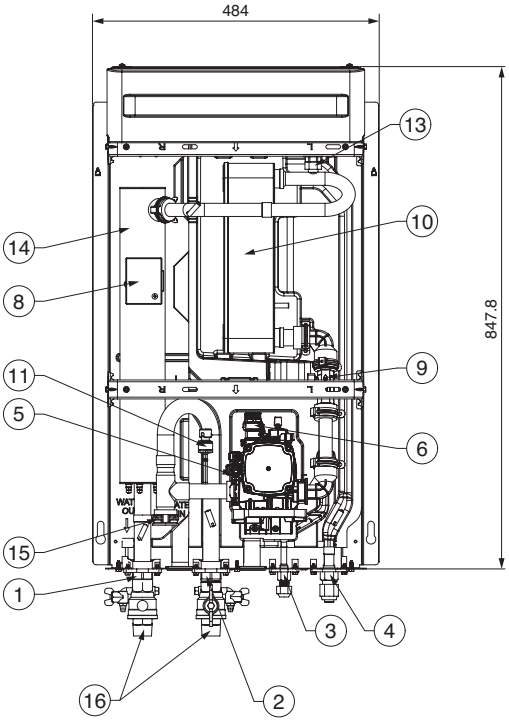


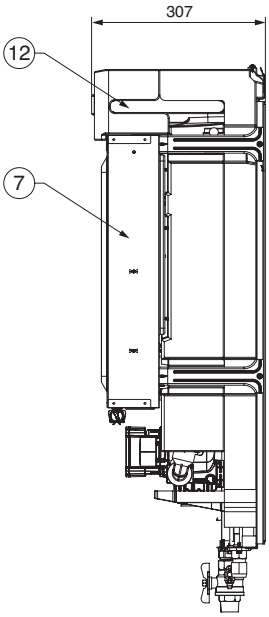


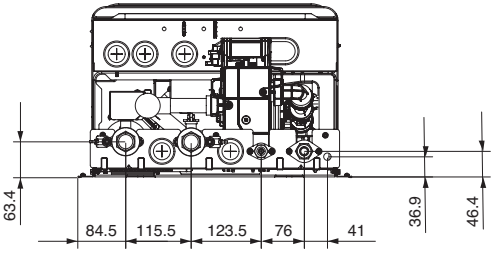
Indoor unit : Internal

- For Split R32 Indoor unit 5 Series

(unit : mm)



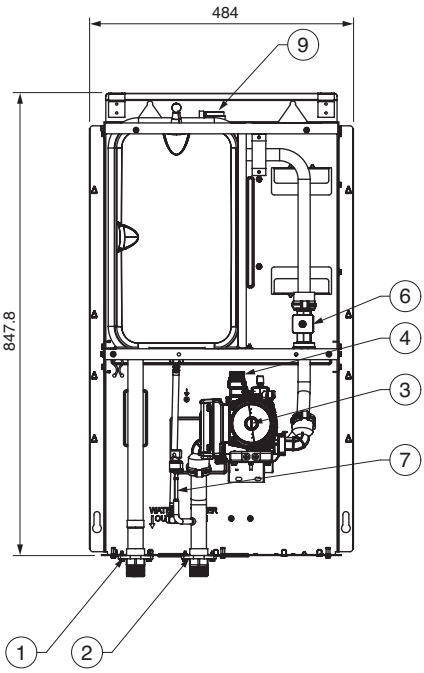


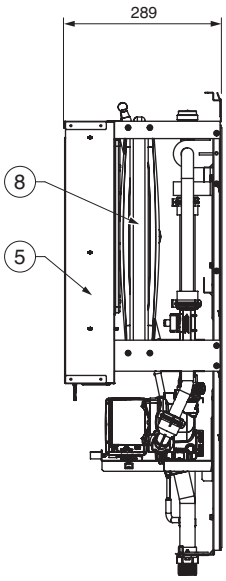


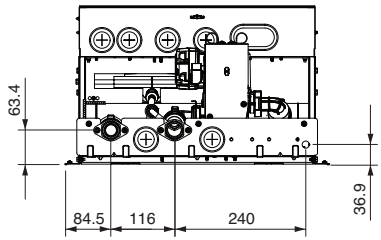
Indoor unit : Internal

- For Hydrosplit 1-pipe

(unit : mm)

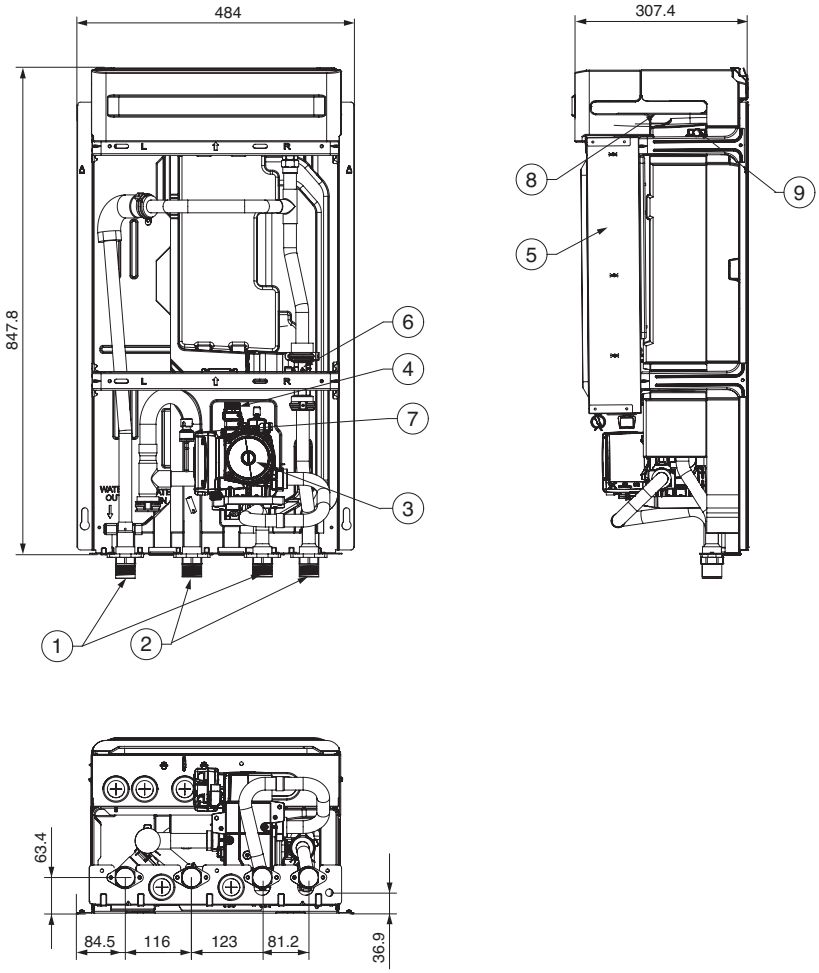






- For Hydrosplit 2-pipe

(unit : mm)



- For Split

No	Name	Remark
1	Leaving Water Pipe	Male PT 1 inch
2	Entering Water Pipe	Male PT 1 inch
3	Refrigerant Pipe	Ø 9.52 mm
4	Refrigerant Pipe	Ø 15.88 mm
5	Water Pump	Max Head 9.5 / 7 / 6 m
6	Safety Valve	Open at water pressure 3 bar
7	Control Box	PCB and terminal blocks
8	Thermal switch	Cut-off power input to backup heater at 90 °C (manual return at 55 °C)
9	Flow Switch	Minimum operation range at 15 LPM.
	Flow Sensor	Range : 5 ~ 80 L/min
10	Plate Heat Exchanger	Heat exchange between refrigerant and water
11	Pressure Gauge	Indicates circulating water pressure
	Pressure Sensor	Detects circulating water pressure
12	Expansion Tank	Absorbing Volume change of heated water
13	Air Vent	Air purging when Charging water
14	Backup heater	Cut-off power input to backup heater at 184 °C (Not Recoverable)
15	Strainer	Filtering and stacking particles inside circulating water
16	Shut-off valve	To drain or to block water when pipe connecting

- For Hydrosplit

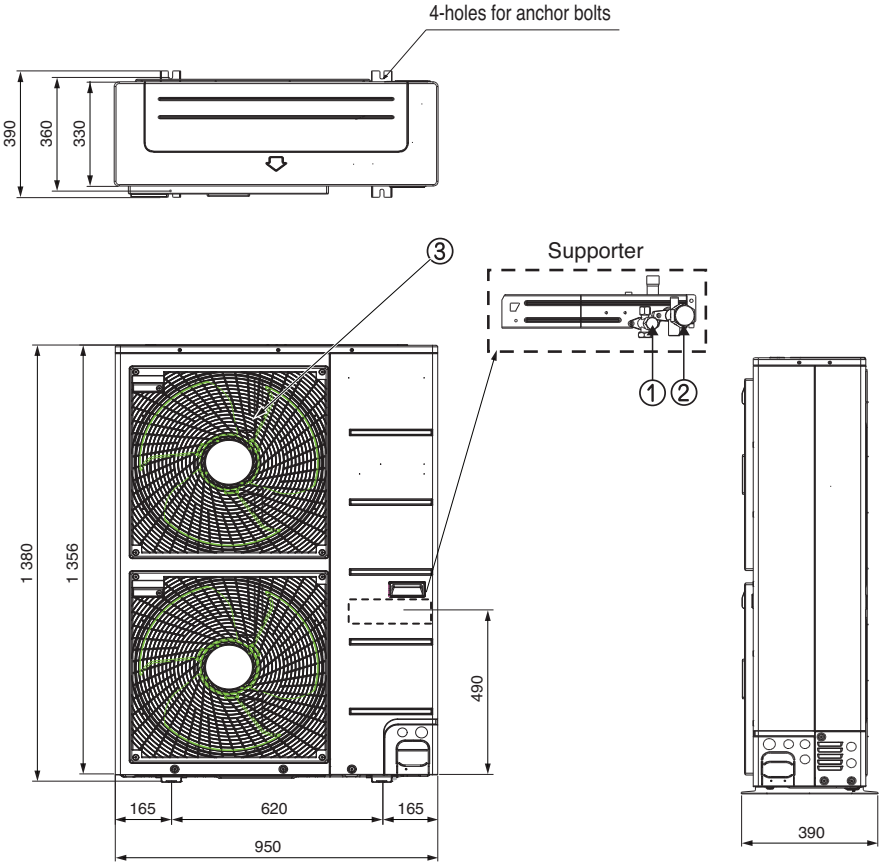
No	Name	Remark
1	Leaving Water Pipe	Male PT 1 inch
2	Entering Water Pipe	Male PT 1 inch
3	Water Pump	Circulating the water
4	Safety Valve	Open at water pressure 3 bar
5	Control Box	PCB and terminal blocks
6	Flow Sensor	Range : 5 ~ 80 L/min
7	Pressure Sensor	Detects circulating water pressure
8	Expansion Tank	Absorbing Volume change of heated water
9	Air Vent	Air Pumping when Charging water

Outdoor unit : External

- For Split

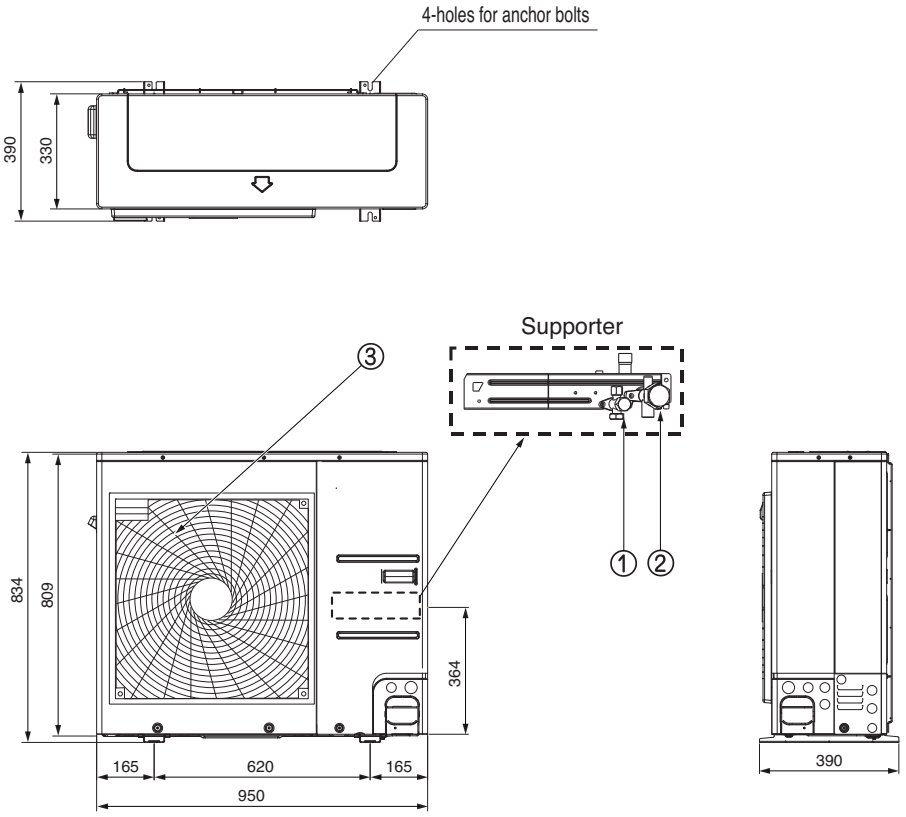
Product Heating Capacity : 12 kW, 14 kW, 16 kW
Chassis : U60A

(unit : mm)



Product Heating Capacity : 5 kW, 7 kW, 9 kW
Chassis : U36A

(unit : mm)

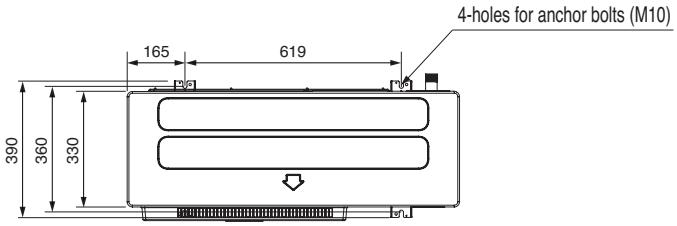


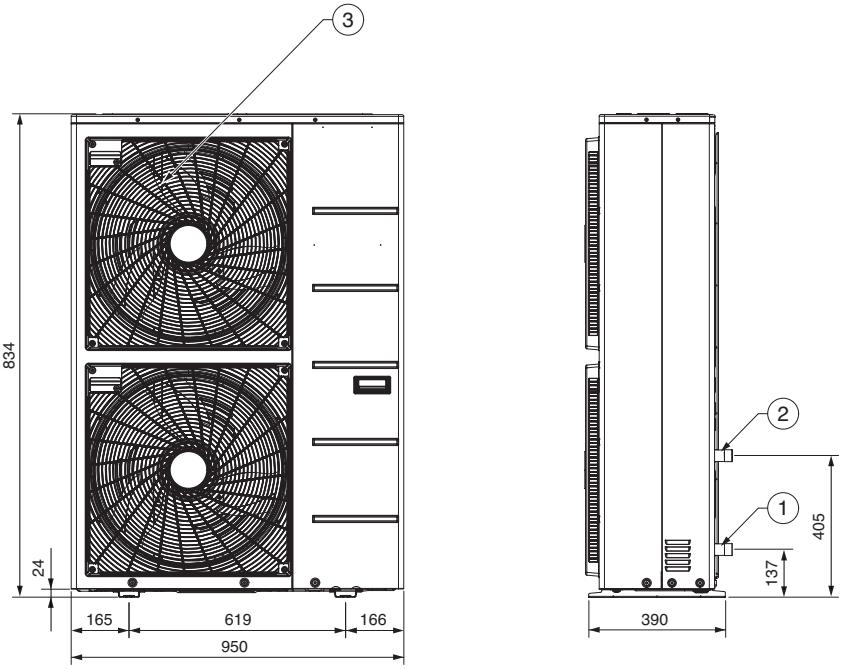
Outdoor unit : External

- For Hydrosplit

Product Heating Capacity : 12 kW, 14 kW, 16 kW
Chassis : U60A

(unit : mm)





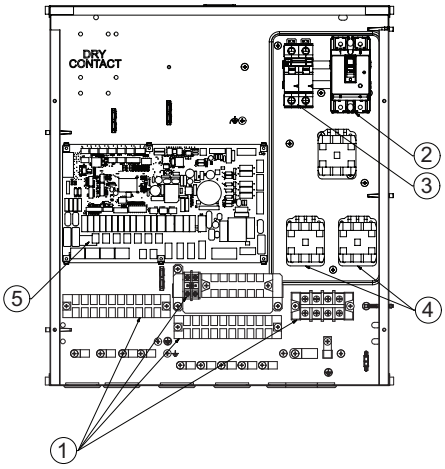
Description

No	Name
1	Entering Water Pipe
2	Leaving Water Pipe
3	Air discharge Grille

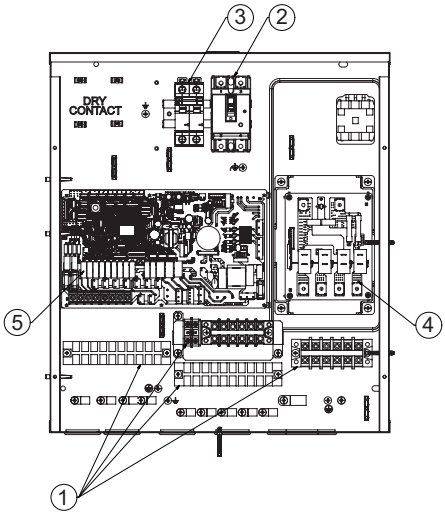
Control Parts (For Split)

Control Box : Indoor Unit

1Ø Electric Heater Model
(For R32 Indoor unit 4 Series, For R410A Indoor unit 3 Series)



With magnet switch
(Production date : Until Sep. 30, 2019)

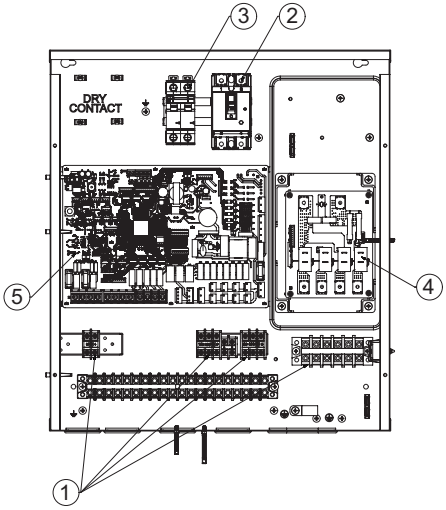


With heater PCB
(Production date : From Oct. 1, 2019)

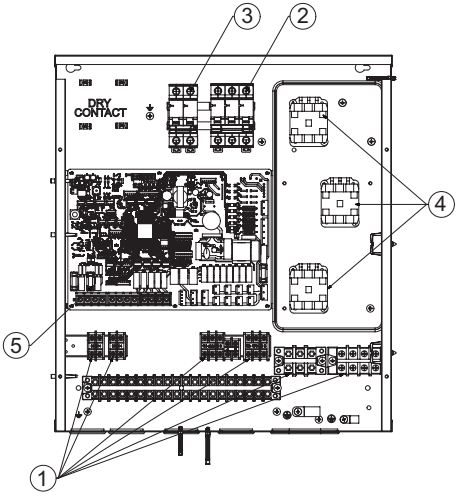
Description

No	Name	Remark
1	Terminal blocks	The terminal blocks allow easy connection of field wiring
2	Unit ELB	The ELB protects the unit against overload or short circuit
3	Booster heater ELB (optional)	The ELB protects the booster heater in DHW tank against overload or short circuit
4	Magnet switch	Magnet switch / Heater PCB(Printed Circuit Board) controls the functioning of the backup heater
	Heater PCB (Relay)	
5	Main PCB	The main PCB(Printed Circuit Board) controls the functioning of the unit

1Ø Electric Heater Model
(For R32 Indoor unit 5 Series,
For R410A Indoor unit 5 Series)



3Ø Electric Heater Model
(For R410A Indoor unit 5 Series)

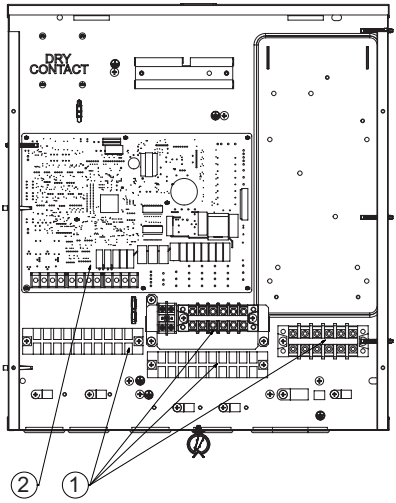


Description

No	Name	Remark
1	Terminal blocks	The terminal blocks allow easy connection of field wiring
2	Unit ELB	The ELB protects the unit against overload or short circuit
3	Booster heater ELB (optional)	The ELB protects the booster heater in DHW tank against overload or short circuit.
4	Heater PCB (Relay)	Heater PCB(Printed Circuit Board) controls the functioning of the backup heater
5	Main PCB	The main PCB(Printed Circuit Board) controls the functioning of the unit

Control Parts (For Hydrosplit 1-Pipe)

Control Box : Indoor Unit

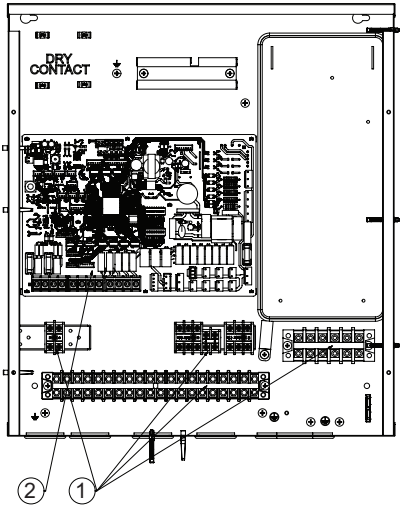


Description

No	Name	Remark
1	Terminal blocks	The terminal blocks allow easy connection of field wiring
2	Main PCB	The Main PCB(Printed Circuit Board) controls the functioning of the unit

Control Parts (For Hydrosplit 2-Pipe)

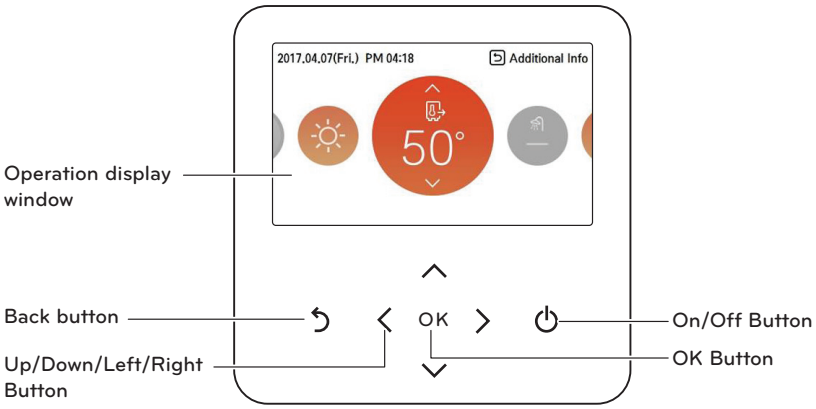
Control Box : Indoor Unit



Description

No	Name	Remark
1	Terminal blocks	The terminal blocks allow easy connection of field wiring
2	Main PCB	The Main PCB(Printed Circuit Board) controls the functioning of the unit

Control Panel



Operation display window	Operation and Settings status display
Back button	When you move to the previous stage from the menu's setting stage
Up/down/left/right button	When you change the menu's setting value
OK button	When you save the menu's setting value
On/Off button	When you turn ON/OFF the AWHP

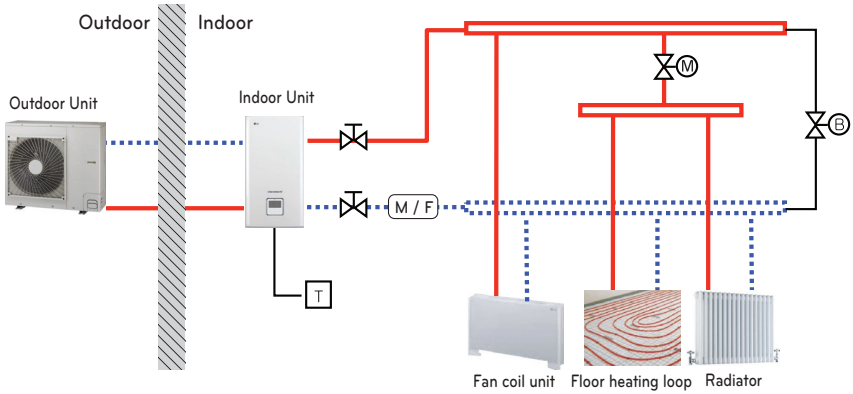
Typical Installation Example

⚠ CAUTION

If THERMA V. is installed with pre-existing boiler, the boiler and THERMA V. should not be operated together. If entering water temperature of THERMA V. is above 55 °C, the system will stop operation to prevent mechanical damage of the product. For detailed electric wiring and water piping, please contact authorized installer.
Some installation scenes are presented for example. As these scenes are conceptual figures, installer should optimize the installation scene according to the installation conditions.

CASE 1: Connecting Heat Emitters for Heating and Cooling

(Under floor loop, Fan Coil Unit, and Radiator)

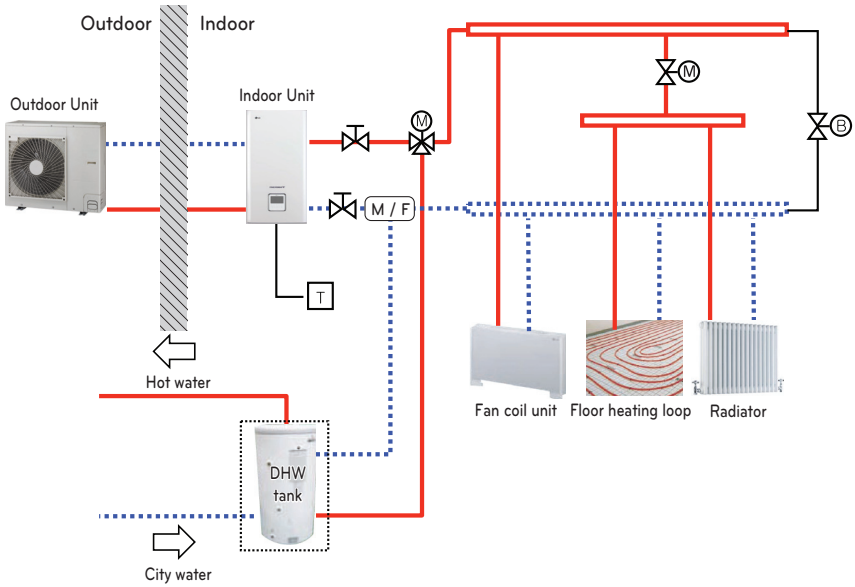


NOTE

- Room thermostat
  - Type of thermostat and specification should be complied with chapter 8 of THERMA V. installation manual.
- 2way valve
  - It is important to install 2way valve to prevent dew condensation on the floor and radiator while cooling mode.
  - Type of 2way control valve and specification should be complied with chapter 8 of THERMA V. installation manual.
  - 2way valve should be installed at the supply side of the collector.
- By-pass valve
  - To secure enough water flow rate, by-pass valve should be installed at the collector.
  - By-pass valve should guarantee minimum water flow rate in any case. Minimum water flow rate is described in water pump characteristics curve.

High Temperature	T Room Thermostat(Field supply)	Shut-off valve
Low Temperature	M 2way valve (Field supply)	B By-pass valve(Field supply)
M / F Magnetic Filter (Recommended)		

CASE 2: Connecting DHW Tank

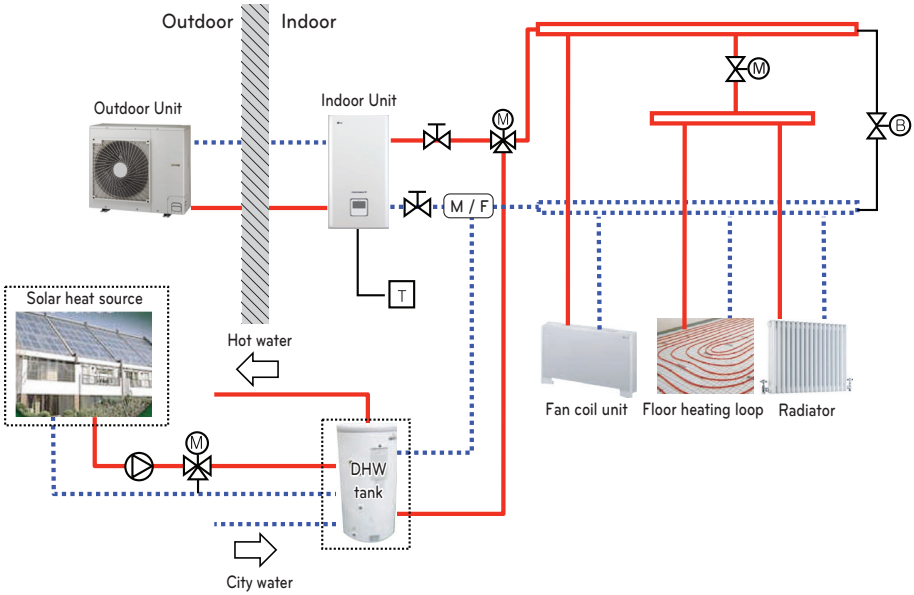


NOTE

- DHW tank
  - It should be equipped with booster heater to generate sufficient heat energy in very cold season.
  - DHW : Domestic Hot Water
- 3way valve
  - Type of 3way valve and specification should be complied with chapter 8 of THERMA V. installation manual.

High Temperature	T Room Thermostat(Field supply)	
Low Temperature	M 2way valve (Field supply)	M 3way valve (Field supply)
Shut-off valve	B By-pass valve(Field supply)	
M / F Magnetic Filter (Recommended)		

CASE 3: Connecting Solar thermal system

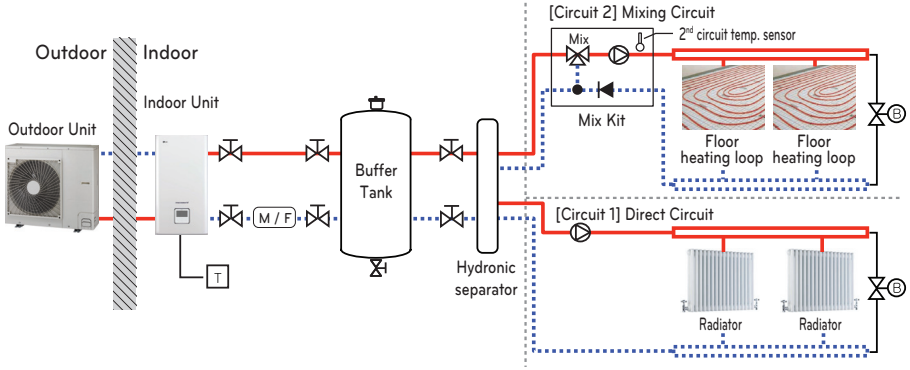


NOTE

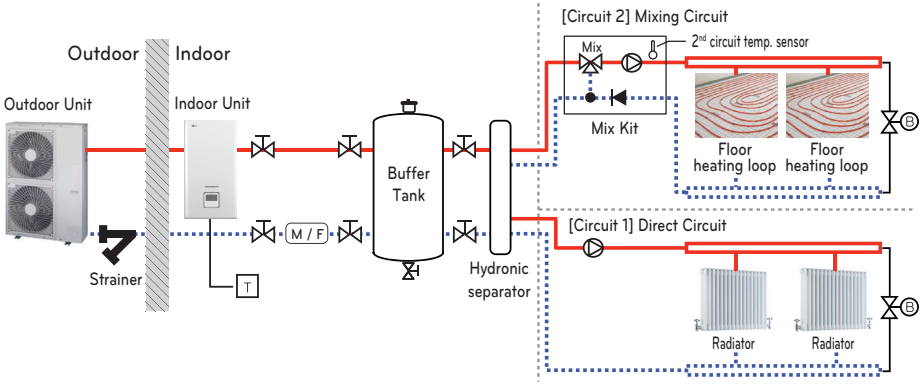
- DHW tank
  - It should be equipped with booster heater to generate sufficient heat energy in very cold season.
  - DHW : Domestic Hot Water
- Pump
  - Maximum power consumption of pump should be less than 0.25 kW.

High Temperature	T Room Thermostat(Field supply)	
Low Temperature	M 2way valve (Field supply)	M 3way valve (Field supply)
Shut-off valve	B By-pass valve(Field supply)	Pump(Field supply)
M / F Magnetic Filter (Recommended)		

CASE 4-1: Connecting 2nd Circuit



CASE 4-2: Connecting 2nd Circuit (For Hydrosplit)



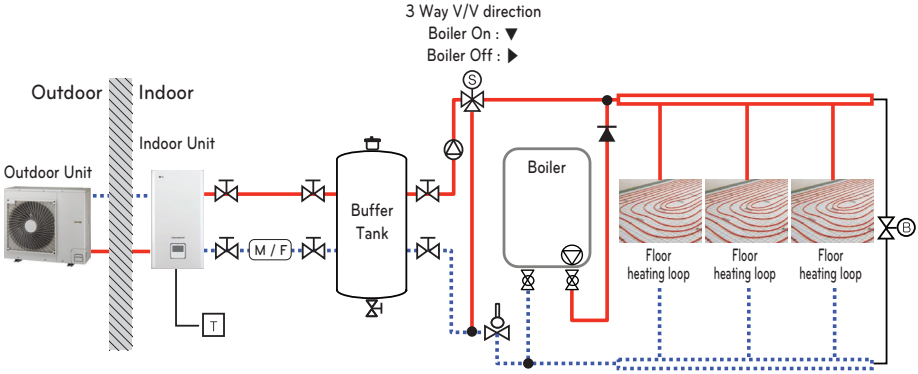
❊ Water In / Water Out installation scene may vary depending on the model.

NOTE

- Mix Kit
  - You can install it when you want to set the temperature of two rooms individually
  - When heating, Circuit 2 can not be higher than Circuit 1.
  - When cooling, Circuit 2 can not be lower than Circuit 1.
  - The types and specifications of the Mix Kit are to comply with chapter 8 of the THERMA V Installation Manual.

High Temperature	T Room Thermostat(Field supply)	
Low Temperature	2way valve (Field supply)	3way valve (Field supply)
Shut-off valve	By-pass valve(Field supply)	Pump(Field supply)
M / F Magnetic Filter (Recommended)	Air vent (Field supply)	Mix Kit (Field supply)
Pressure Regulation valve (Field supply)		

CASE 5: Connecting 3rd Party Boiler



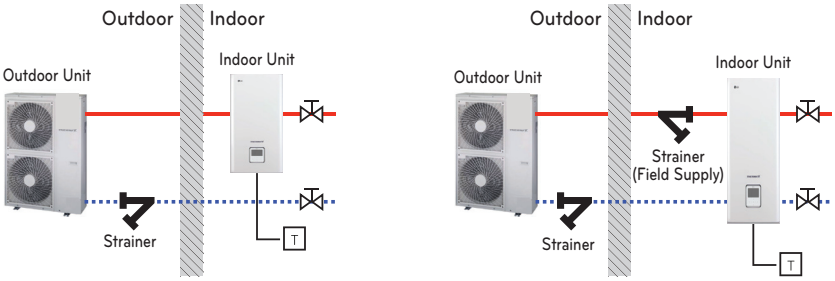
NOTE

- 3rd Party Boiler
  - 3rd party boiler can be controlled by manually via remote controller or automatically itself by means of comparing the outside air temperature and the pre-set temperature.
- 3way valve
  - Type of 3way valve and specification should be complied with chapter 8 of installation manual.

High Temperature	Room Thermostat(Field supply)		
Low Temperature	2way valve (Field supply)	3way valve (Field supply)	
Shut-off valve	By-pass valve(Field supply)	Pump(Field supply)	
M / F Magnetic Filter (Recommended)	Air vent (Field supply)	Aquastat V/V	
Check valve			

(For Hydrosplit)

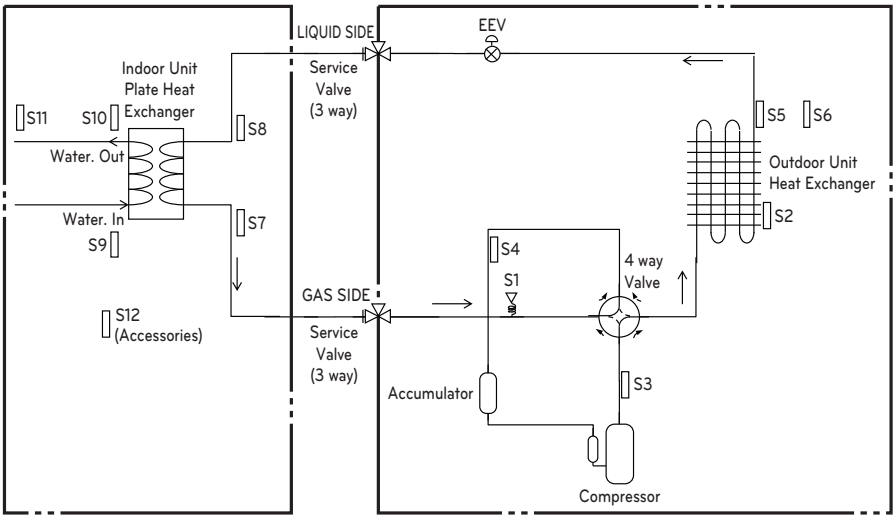
To protect the product, be sure to install a strainer on the water inlet pipe.



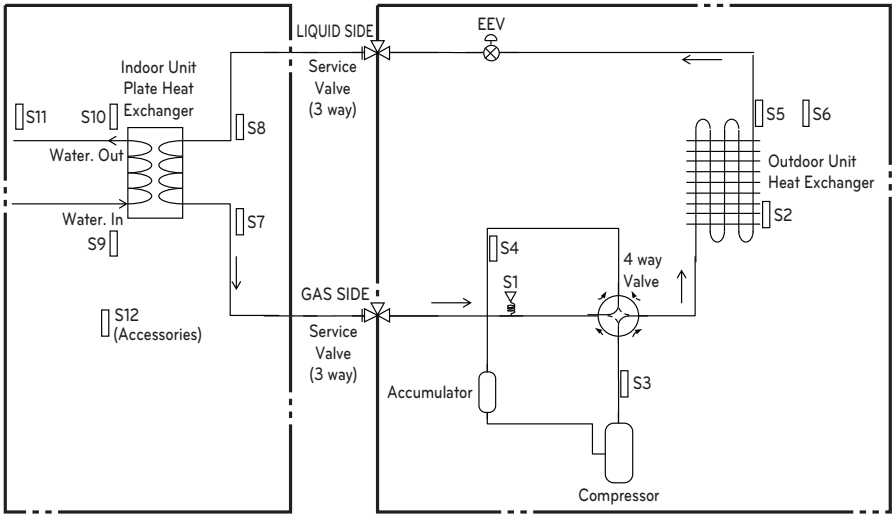
❋ Water In / Water Out installation scene may vary depending on the model.

Cycle Diagram (For R410A)

Outdoor unit 3 Series



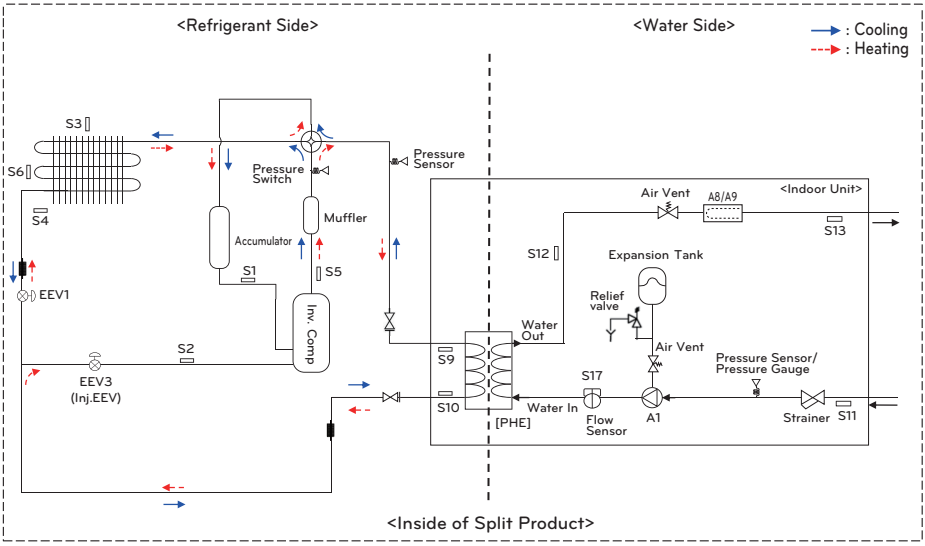
Outdoor unit 4 Series



Description

Category	Symbol	Meaning	PCB Connector	Remarks
Outdoor Unit	S1	Pressure sensor	CN_H_PRESS	
	S2	Condenser middle temperature sensor	CN_MID	
	S3	Compressor-discharge pipe temperature sensor	CN_DISCHA	
	S4	Compressor-suction pipe temperature sensor	CN_SUCTION	
	S5	Condenser temperature sensor	CN_C_PIPE	- Description is expressed based on Cooling mode.
	S6	Outdoor air temperature sensor	CN_AIR	
	EEV	Electronic Expansion Valve	CN_EEV1_WH	
Indoor Unit	S7	PHEX gas temp. sensor	CN_PIPE_OUT	- Meaning is expressed based on Cooling mode.
	S8	PHEX liquid temp. sensor	CN_PIPE_IN	
	S9	Entering water temperature sensor	CN_TH3	
	S10	Leaving water temperature sensor		
	S11	Electric heater outlet temperature sensor		
	S12	Remote air temperature sensor	CN_ROOM	- Optional accessory (being sold separately) - Not shown in diagram

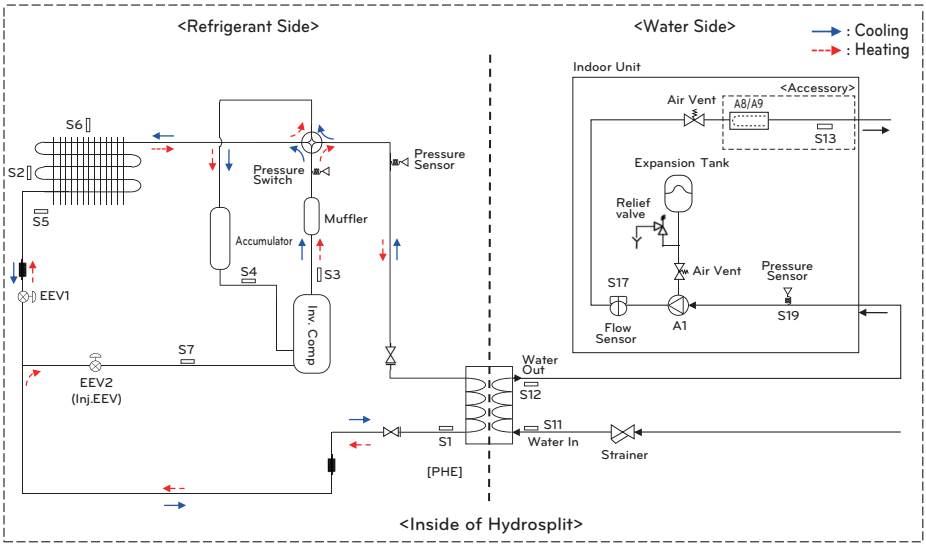
Cycle Diagram (For R32 Split)



Description

Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	Compressor-suction pipe temperature sensor	CN_SUCTION
	S2	Inlet IHEX temperature sensor	CN_VI_IN
	S3	Outdoor air temperature sensor	CN_AIR
	S4	Outdoor-HEX temp. sensor	CN_C_PIPE
	S5	Compressor-discharge pipe temperature sensor	CN_DISCHARGE
	S6	Outdoor-HEX middle temp. sensor	CN_MID
	S9	PHEX gas temp. sensor	CN_PIPE/OUT
	S10	PHEX liquid temp. sensor	CN_PIPE/IN
	EEV1	Electronic Expansion Valve (Heating)	CN_EEV1
	EEV3	Electronic Expansion Valve (Injection)	CN_EEV3
Water Side	S11	Inlet water temperature sensor	CN_TH3
	S12	Outlet water temperature sensor	
	S13	Backup heater outlet sensor	
	S17	Flow sensor	CN_F_METER
	A1	Main water pump	CN_MOTOR1 CN_W_PUMP_A
	A8	Electric backup heater (Step 1)	CN_E_HEAT_A
	A9	Electric backup heater (Step 2)	CN_E_HEAT_B

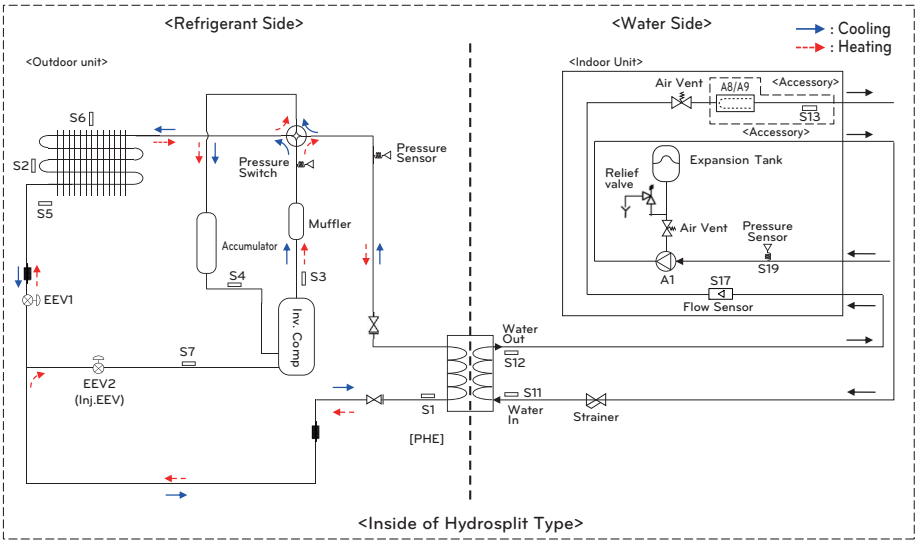
Cycle Diagram (For Hydrosplit 1-Pipe)



Description

Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	PHEX liquid temperature sensor	CN_PIPE_IN
	S2	Outdoor-HEX middle temperature sensor	CN_MID
	S3	Compressor-discharge pipe temperature sensor	CN_DISCHARGE
	S4	Compressor-suction pipe temperature sensor	CN_SUCTION
	S5	Outdoor-HEX temperature sensor	CN_C_PIPE
	S6	Outdoor air temperature sensor	CN_AIR
	S7	Compressor-injection pipe temperature sensor	CN_VI_IN
	EEV1	Electronic Expansion Valve (Heating/Cooling)	CN_EEV1
	EEV2	Electronic Expansion Valve (Injection)	CN_EEV_MAIN
Water Side	S12	Outlet water temperature sensor	CN_WATER_OUT
	S11	Inlet water temperature sensor	CN_WATER_IN
	S13	Backup heater outlet temperature sensor	CN_TH3
	S17	Flow sensor	CN_F_SENSOR
	S19	Water pressure sensor	CN_H20_PRESS
	A1	Main Water Pump	CN_PUMP_A1 CN_MOTOR1
	A8	Electric backup heater (1Ø, Optional accessory)	CN_HEATER_PCB
	A9	Electric backup heater (3Ø, Optional accessory)	HEATER1

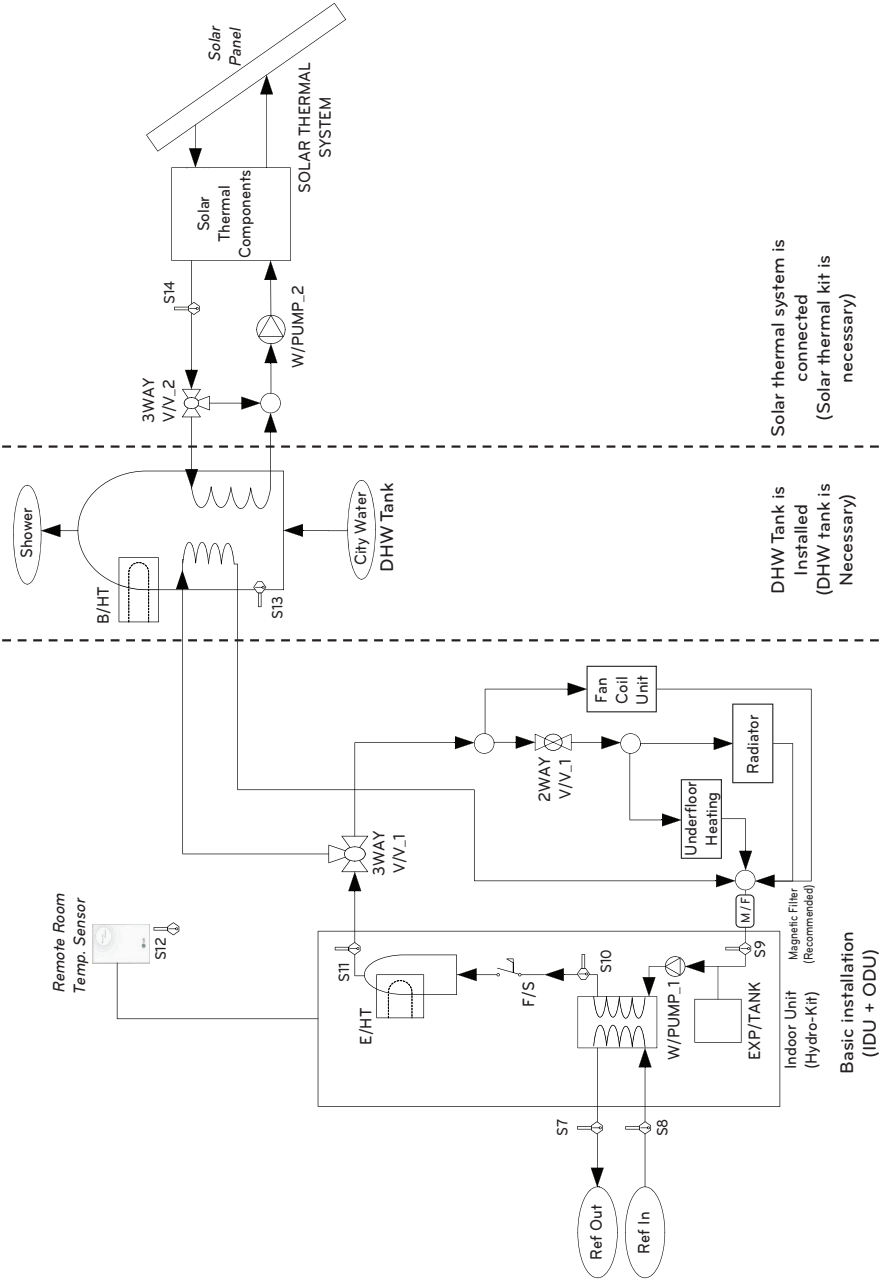
Cycle Diagram (For Hydrosplit 2-Pipe)



Description

Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	PHEX liquid temperature sensor	CN_PIPE_IN
	S2	Outdoor-HEX middle temperature sensor	CN_MID
	S3	Compressor-discharge pipe temperature sensor	CN_DISCHARGE
	S4	Compressor-suction pipe temperature sensor	CN_SUCTION
	S5	Outdoor-HEX temperature sensor	CN_C_PIPE
	S6	Outdoor air temperature sensor	CN_AIR
	S7	Compressor-injection pipe temperature sensor	CN_VI_IN
	EEV1	Electronic Expansion Valve (Heating/Cooling)	CN_EEV1
	EEV2	Electronic Expansion Valve (Injection)	CN_EEV_MAIN
Water Side	S12	Outlet water temperature sensor	CN_WATER_OUT
	S11	Inlet water temperature sensor	CN_WATER_IN
	S13	Backup heater outlet temperature sensor	CN_TH3
	S17	Flow sensor	CN_F_SENSOR
	S19	Water pressure sensor	CN_H20_PRESS
	A1	Main Water Pump	CN_PUMP_A1 CN_MOTOR1
	A8	Electric backup heater (1Ø, Optional accessory)	CN_HEATER_PCB
	A9	Electric backup heater (3Ø, Optional accessory)	HEATER1

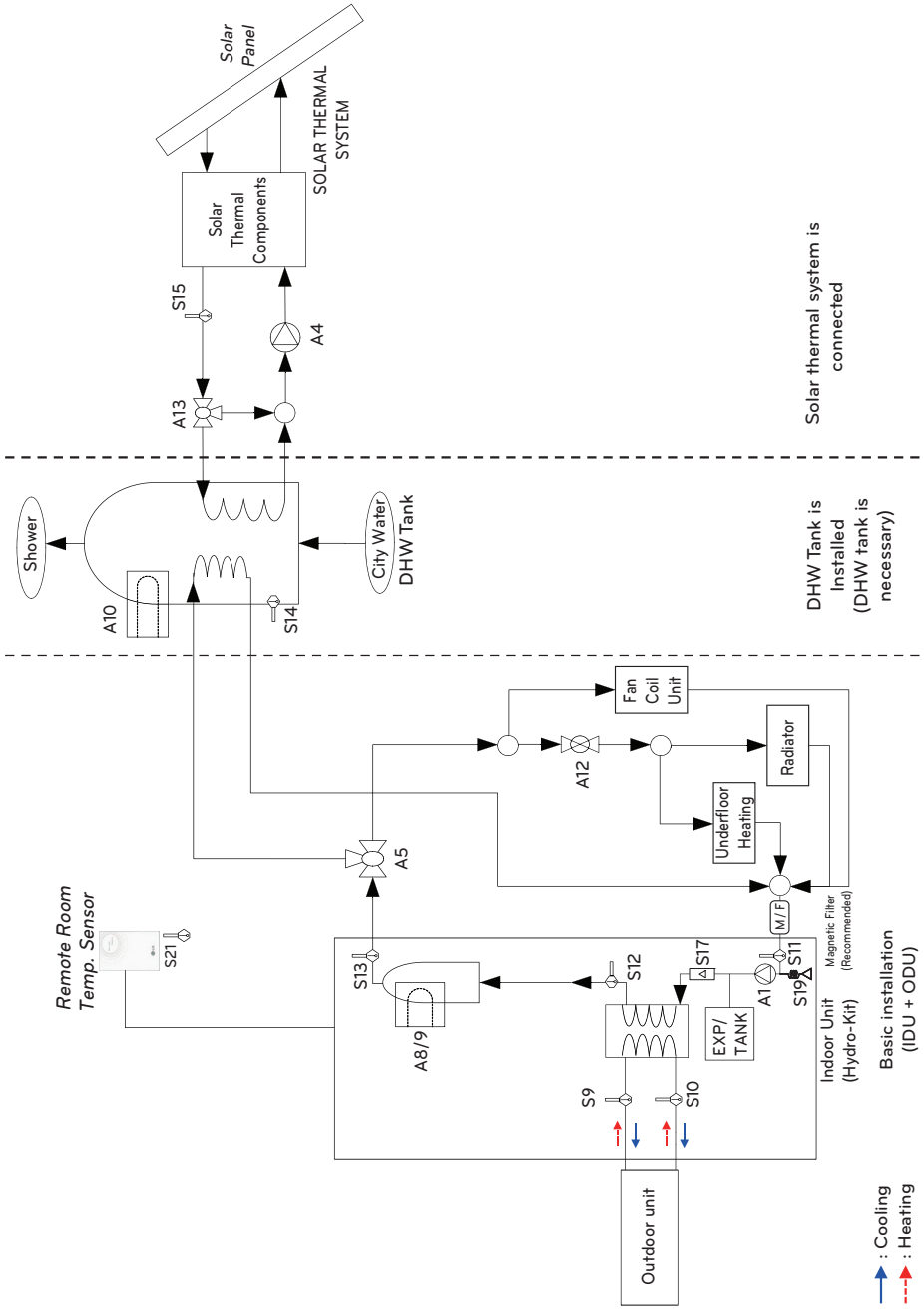
Water cycle (For R410A)



Description (For R410A)

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor Unit	S7	Refrigerant temperature sensor (Gas side)	CN_PIPE_OUT	- Meaning is expressed based on Cooling mode.
	S8	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	
	S9	Entering Water temperature sensor	CN_TH3	- S9, S10 and S11 are connected at 6 pin type connector CN_TH3.
	S10	Leaving Water temperature sensor		
	S11	Electric heater outlet temperature sensor		
	F/S	Flow Switch	CN_FLOW1	
	E/HT	Backup heater	CN_E/HEAT(A) CN_E/HEAT(B)	- Heating capacity is divided into two level : partial capacity by E/HEAT(A) and full capacity by E/HEAT(A) + E/HEAT(B). - Operating power(230 V AC 50 Hz) of E/HEAT(A) and E/HEAT(B) are supplied by external power source via relay connector and ELB.
	W_PUMP1	Internal Water Pump	CN_MOTOR1	- Water Pump is connected at CN_MOTOR1
	EXP/TANK	Expansion Tank	(no connector)	- Absorb volume change of heated water,
	S12	Remote Air temperature sensor	CN_ROOM	- Optional accessory (sold separately) - Model : PQRSTA0
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
	2WAY V/V_1	To control water flow for Fan Coil Unit	CN_2WAY(A)	- 3rd party accessory and Field installation (sold separately) - 2 wire NO or NC type 2way valve is supported.
	M / F	Magnetic Filter	(No connector)	- 3rd party accessory and Field installation (sold separately) - It is strongly recommended to install an additional filter on the heating water circuit.
Water Heating	W/TANK	DHW Tank	(No connector)	- 3rd party accessory and Field installation (sold separately) - Generating and storing DHW by AWHP or built-in electric heater
	B/HT	Booster heater	CN_B/HEAT(A)	- 3rd party accessory and Field installation (usually built-in at W/TANK) - Supplying additional water heating capacity.
	3WAY V/V_1	- Flow control for water which is leaving from indoor unit. - Flow direction switching between underfloor and water tank	CN_3WAY(A)	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	CITY WATER	Water to be heated by Indoor unit and B/HT of W/TANK	(no connector)	- Field installation
	SHOWER	Water supplied to end-user	(no connector)	- Field installation
	S13	W/TANK water temperature sensor	CN_TH4	- S13 and S14 are connected at 4 pin type connector CN_TH4. - S13 is a part of DHW tank kit. (Model : PHLTA, PHLTC) - S14 is a part of solar thermal kit (Model:PHLLA)
Solar Heating	S14	Solar-heated water temperature sensor		
	3WAY V/V_2	- Flow control for water which is heated and circulated by SOLAR THERMAL SYSTEM. - Flow direction switching between SOLAR THERMAL SYSTEM and W/TANK	CN_3WAY(B)	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	W_PUMP/2	External Water Pump	CN_W/PUMP(B)	- 3rd party accessory and Field installation (sold separately) - If water pump of SOLAR THERMAL SYSTEM is incapable of circulation,external water pump can be used.
	SOLAR THERMAL SYSTEM	- This system can include following components : Solar panel, Sensors, Thermostats, Interim heat exchanger, Water pump, etc. - To utilized hot water heated by SOLAR THERMAL SYSTEM, end-user must install Solar-Kit accessory (PHLLA) provided by LG	(no connector)	- 3rd party accessory and Field installation (sold separately)

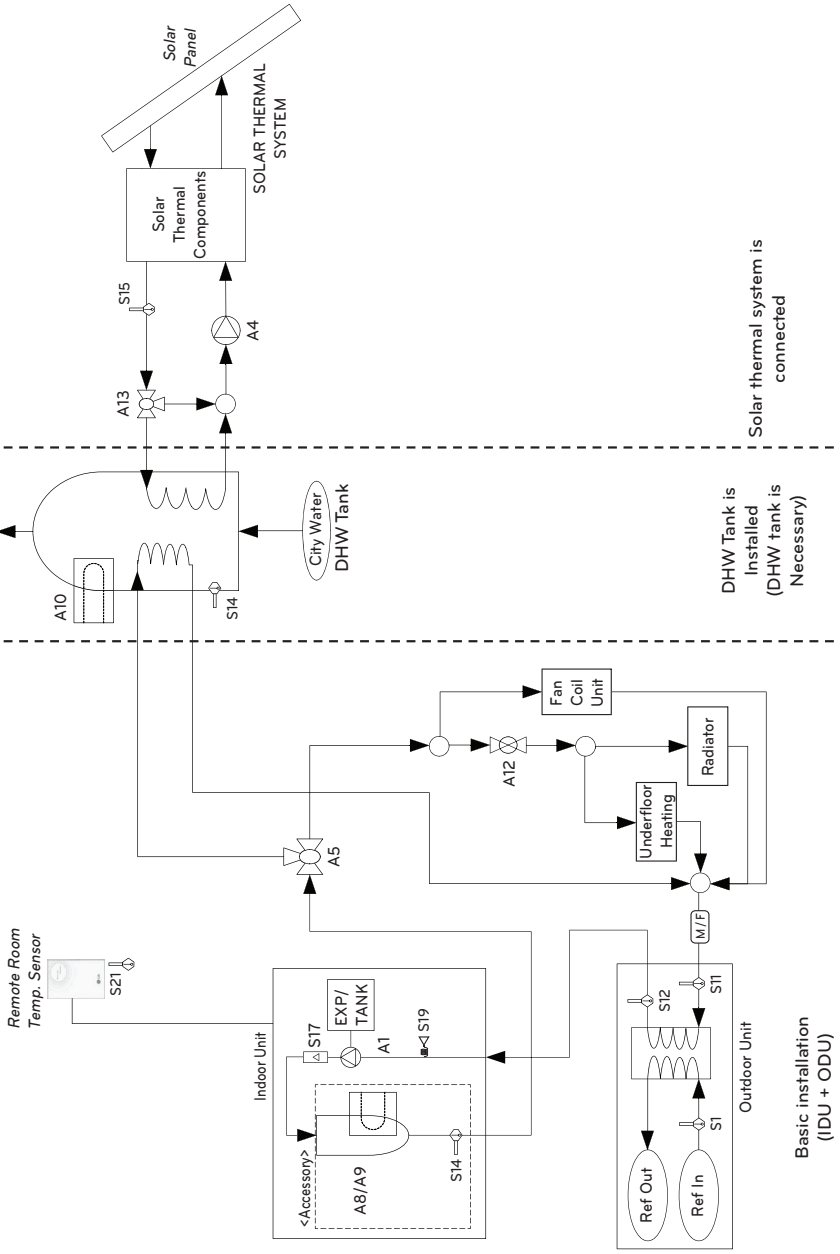
Water cycle (For Split R32)



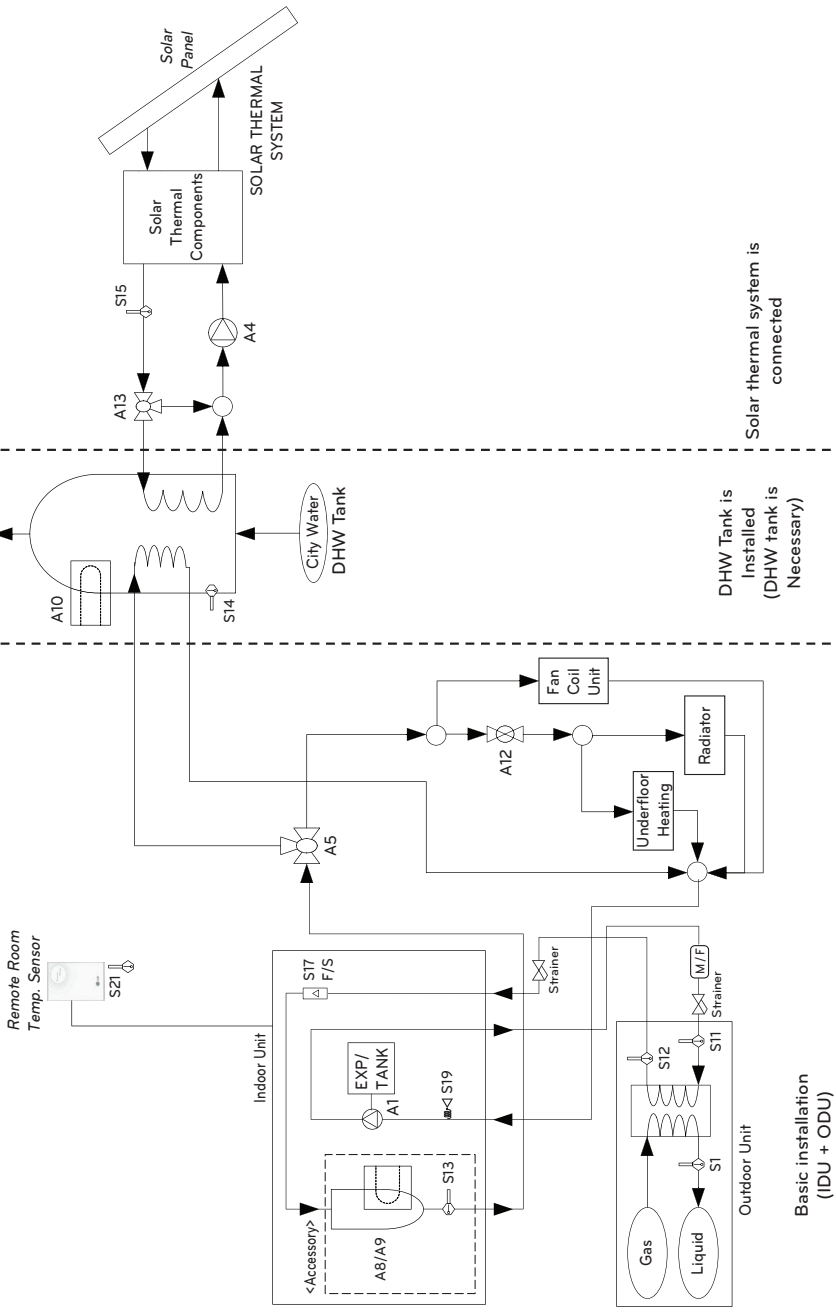
Description (For Split R32)

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor unit / Main circuit	S9	Refrigerant temperature sensor (Gas side)	CN_PIPE_OUT	- NTC5kOhm
	S10	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	- NTC5kOhm
	S11	Entering water temperature sensor	CN_TH3 (WATER IN)	- NTC5kOhm - S11,S12 and S13 are connected at 6-pin-type connector CN_TH3
	S12	Leaving water temperature sensor	CN_TH3 (PHEX OUT)	
	S13	Backup heater outlet temperature sensor	CN_TH3 (HEATER OUT)	
	S17	Flow Sensor	CN_F_SENSOR	- to monitor water flow rate
	S19	Entering Water Pressure sensor	CN_H2O_PRESS	- to monitor water pressure
	S20	Reserved	TB_SENSOR (AMBIENT)	
	S21	Remote room air sensor (Direct circuit)	CN_ROOM1	- Accessory: PQRSTA0 - NTC10kOhm
	A1	Internal water pump	CN_PUMP_A1 CN_MOTOR1	- Power is supplied via CN_PUMP_A1 - PWM signal is supplied via CN_MOTOR1
	A2	External pump	TB_EXT (PUMP A2)	- voltage-free contact - External water pump if head of internal pump is not sufficient or if parallel buffer tank is used
	A8 / A9	Backup heater (2 steps)	Coil 1: CN_L1, CN_N1 Coil 2: CN_L2, CN_N2 on HEATER-PCB	- Operating power(230 V AC 50 Hz) is supplied by external power source via Terminal block
	A12	2-way valve to block underfloor circuit from cooling water	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) - 2-wire NO- or NC-type 2-way valve is supported.
	EXP/TANK	Expansion vessel	-	- Absorbs volume change of eating water
	CTR/PNL	Control panel / Remote controller	CN_REMO	
	M/F	Magnetic filter	-	- 3rd party accessory and Field installation (sold separately) - It is strongly recommended to install an additional filter on the heating water circuit.
Domestic hot water circuit	S14	DHW tank temperature	CN_TH4 (BOOST)	- S14 is connected at 4-pin-type connector CN_TH4 - Accessory: PHRSTA0 - S14 is a part of DHW tank kit (Model : PHLTA)
	A5	3-way valve for changing between heating (cooling) and DHW tank	CN_3WAY_A	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	A10	DHW booster heater	CN_TANK_HEATER	- 3rd party accessory and Field installation (sold separately) - Operating power (230 V AC 50 Hz) is supplied by external power source via Terminal block - Accessory: PHLTA (Relay, harness and DHW sensor)
	W/TANK	Domestic hot water tank	-	- Accessory (OSHW-series) or third-party tank suitable for heat pumps
	A15	Reserved	CN_PUMP A15	
	S23	Reserved	CN_RECIRC	
Solar thermal circuit	S15	Solar collector sensor	TB_SENSOR (SOLAR)	- 3rd party accessory and Field installation (sold separately) - PT100
	S16	Reserved	CN_TH4 (SOLAR)	- for solar collector sensor use S15
	A4	Solar collector pump	CN_PUMP_A4	- 3rd party accessory and Field installation (sold separately)
	A13	3way-valve Solar	CN_3WAY_B	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	Solar thermal system	Solar thermal equipment such as collector, solar pump, PT1000 sensor, solar heat-exchanger	-	- 3rd party accessory and Field installation (sold separately)

Water cycle (For Hydrosplit 1-Pipe)



Water cycle (For Hydrosplit 2-Pipe)



Description (For Hydrosplit)

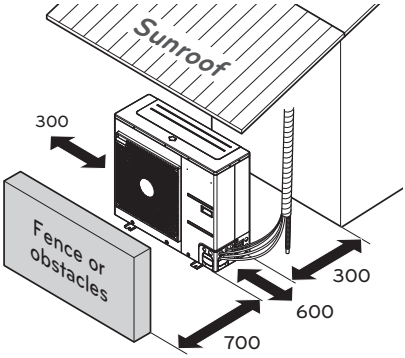
Category	Symbol	Meaning	PCB Connector	Remarks
Outdoor Unit	S1	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	Meaning is expressed based on Cooling mode.
	S11	Inlet water temperature sensor	CN_WATER_IN	Entering water temperature sensor
	S12	Outlet water temperature sensor	CN_WATER_OUT	Leaving water temperature sensor
	M/F	Magnetic Filter	(No connector)	- 3rd party accessory and Field installation (sold separately) - It is strongly recommended to install an additional filter on the heating water circuit
Indoor Unit	S19	Entering Water Pressure sensor	CN_H20_PRESS	
	A8/A9	Backup Heater	(No connector)	- Optional accessory (sold separately) - HA061B E1 : 1Ø, HA063B E1 : 3Ø
	S13	Backup heater outlet temperature sensor	CN_TH3	- Accessory supplied with Backup heater
	A1	Internal Water Pump	CN_MOTOR1 CN_PUMP_A1	- Water Pump is connected at CN_MOTOR1 and CN_PUMP_A1
	A2	External pump	TB_EXT (PUMP A2)	- voltage-free contact - External water pump if head of internal pump is not sufficient or if parallel buffer tank is used
	EXP/TANK	Expansion Tank	(No connector)	- Absorb volume change of heated water.
	S17	Flow sensor	CN_F_SENSOR	
	S21	Remote room air sensor (Direct circuit)	CN_ROOM2	- Optional accessory (sold separately) - PQRSTA0
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
	A12	To control water flow for Fan Coil Unit	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) - 2 wire NO or NC type 2way valve is supported
Water Heating	W/TANK	DHW Tank	(No connector)	- 3rd party accessory and Field installation (sold separately) - Generating and storing DHW by AWHP or built-in electric heater
	A10	Booster Heater	CN_TANK_HEATER	- 3rd party accessory and Field installation (usually built-in at W/TANK) - Supplying additional water heating capacity
	A5	- Flow control for water which is leaving from indoor unit. - Flow direction switching between underfloor and water tank.	CN_3WAY_A	- 3rd party accessory and Field installation (sold separately)
	CITY WATER	Water to be heated by indoor unit and B/HT of W/TANK	(No connector)	- Field installation
	SHOWER	Water supplied to end-user	(No connector)	- Field installation
	S14	W/TANK water temperature sensor	CN_TH4	- S14 are connected at 4 pin type connector CN_TH4 - S14 is a part of DHW tank kit (Model : PHLTA, PHLTC)
Solar Heating	S15	Solar-heated water temperature sensor	TB_SENSOR SOLAR	- 3rd party accessory and Field installation (sold separately) - PT1000
	A13	- Flow control for water which is heated and circulated by SOLAR THERMAL SYSTEM. - Flow direction switching between SOLAR THERMAL SYSTEM and W/TANK	CN_3WAY_B	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported
	A4	Solar collector pump	CN_PUMP_A4	- 3rd party accessory and Field installation (sold separately) - If water pump of SOLAR THERMAL SYSTEM is incapable of circulation, external water pump can be used.
	SOLAR THERMAL SYSTEM	- This system can include following components : Solar panel, Sensor, Thermostats, Interim heat exchanger, Water pump, etc.	(No connector)	- 3rd party accessory and Field installation (sold separately)

INSTALLATION OF OUTDOOR UNIT

The outdoor unit of THERMA V is installed outside to exchange heat with ambient air. Therefore, it is important to secure proper space around the outdoor unit and care for specific external conditions. This chapter presents a guide to install the outdoor unit, make a route to connect with the indoor, and what to do when installed around seaside.

Conditions where Outdoor Unit is Installed

- If a sunroof is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the heat exchanger is not restricted.
- Ensure that the spaces indicated by arrows around front, back and side of the unit.
- Do not place animals and plants in the path of the warm air.
- Take the weight of the outdoor unit into account and select a place where noise and vibration are minimum.
- Select a place so that the warm air and noise from the outdoor unit do not disturb neighbors.
- Place that can sufficiently endure the weight and vibration of the outdoor unit and where even Installation is possible.
- Place that has no direct influence of snow or rain.
- Place with no danger of snowfall or icicle drop.
- Place without weak floor of base such as decrepit part of the building or with a lot of snow accumulation.



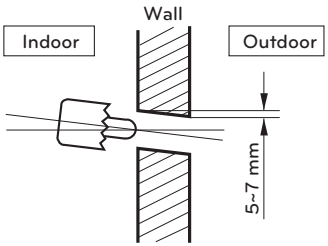
(unit : mm)

Minimum service space

※ The feature may be vary according to the type of model.

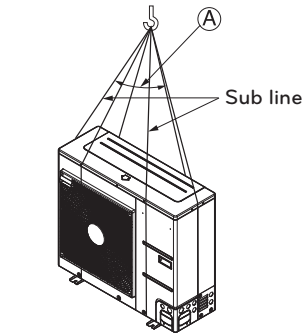
Drill a Hole in the Wall (For Split)

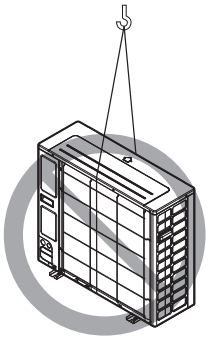
- If making a hole to the wall is required to connect pipe between the indoor unit and the outdoor unit, please follow below descriptions.
  Drill the piping hole with a Ø 70 mm hole core drill.
  Piping hole should be slightly slant to the outdoor side to prevent raindrop into indoor side.

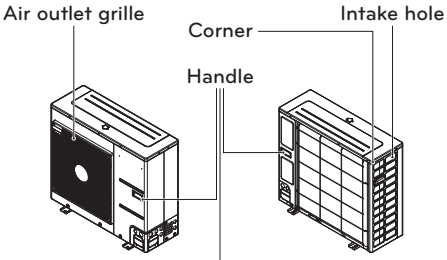


Transporting the Unit

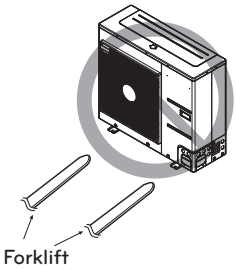
- When carrying the suspended unit, pass the ropes between legs of base panel under the unit.
- Always lift the unit with ropes attached at four points so that impact is not applied to the unit.
- Attach the ropes to the unit at an angle Ⓐ of 40° or less.
- Use only accessories and parts which are of the designated specification when installing.
- Forklift trucks are not available without a palette.
- Be careful not to damage the product when moving the forklift.







Always hold the unit by the corners, as holding it by the side intake holes on the casing may cause them to deform.



⚠ CAUTION

Be very careful while carrying the product.

- Do not have only one person carry product if it is more than 20 kg.
- PP bands are used to pack some products. Do not use them as a mean for transportation because they are dangerous.
- Do not touch heat exchanger fins with your bare hands. Otherwise you may get a cut in your hands.
- Tear plastic packaging bag and scrap it so that children cannot play with it. Otherwise plastic packaging bag may suffocate children to death.
- When carrying in Unit, be sure to support it at four points. Carrying in and lifting with 3-point support may make Outdoor Unit unstable, resulting in a fall.
- Use 2 belts of at least 8 m long.
- Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
- Hoist the unit making sure it is being lifted at its center of gravity.

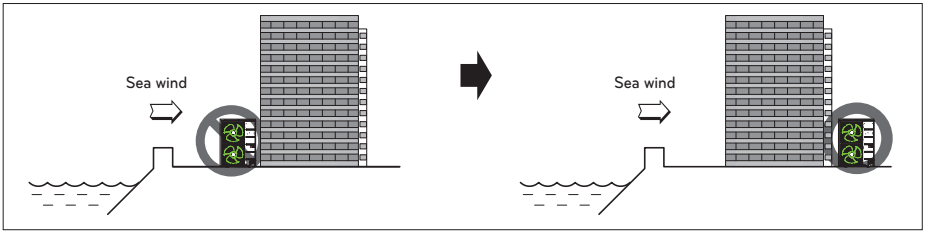
Installation at Seaside

⚠ CAUTION

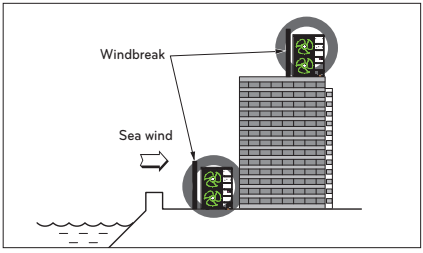
- Unit should not be installed in areas where corrosive gases, such as acid or alkaline gas, are produced.
- Do not install the product where it could be exposed to sea wind (salty wind) directly. It can result corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.
- If outdoor unit is installed close to the seaside, it should avoid direct exposure to the sea wind. Otherwise it needs additional anti-corrosion treatment on the heat exchanger.

Selecting the location(Outdoor Unit)

- If the outdoor unit is to be installed close to the seaside, direct exposure to the sea wind should be avoided. Install the outdoor unit on the opposite side of the sea wind direction.



- In case, to install the outdoor unit on the seaside, set up a windbreak not to be exposed to the sea wind.



- It should be strong enough like concrete to prevent the sea wind from the sea.
- The height and width should be more than 150% of the outdoor unit.
- It should be keep more than 700 mm of space between outdoor unit and the windbreak for easy air flow.

- Select a well-drained place.
  Periodic (more than once/year) cleaning of the dust or salt particles stuck on the heat exchanger by using water.
- If you can't meet above guide line in the seaside installation, please contact your supplier for the additional anti-corrosion treatment.

Seasonal wind and cautions in winter

- Sufficient measures are required in a snow area or severe cold area in winter so that product can be operated well.
- Get ready for seasonal wind or snow in winter even in other areas.
- Install a suction and discharge duct not to let in snow or rain.
- Install the outdoor unit not to come in contact with snow directly. If snow piles up and freezes on the air suction hole, the system may malfunction. If it is installed at snowy area, attach the hood to the system.
- Install the outdoor unit at the higher installation console by 500 mm than the average snowfall (annual average snowfall) if it is installed at the area with much snowfall.
- Where snow accumulated on the upper part of the Outdoor Unit by more than 100 mm, always remove snow for operation.
  - The height of H frame must be more than 2 times the snowfall and its width shall not exceed the width of the product. (If width of the frame is wider than that of the product, snow may accumulate)
  - Don't install the suction hole and discharge hole of the Outdoor Unit facing the seasonal wind.

INSTALLATION OF INDOOR UNIT

The indoor unit of THERMA V is installed inside where terminal of under floor water pipe cycle and refrigerant pipe from the outdoor unit are accessible at the same time.

In this chapter conditions for installation place is described. In addition, considerations when installing accessories or 3rd party accessories are described, too.

Conditions where Indoor Unit is Installed

Specific conditions are required for installation place such as service space, wall mounting, water pipe length and height, total volume of water, adjusting expansion vessel, and water quality.

General Considerations

Followings are should be considered before the installation of the indoor unit.

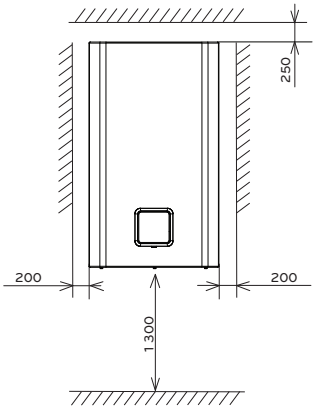
- The installation place should be free from outdoor weather conditions such as rain, snow, wind, frost, etc.
- Choose the place where is water-resistant or good drainage.
- Service space should be secured.
- No flammable materials around the indoor unit.
- Mice can not be appeared to prevent entering the indoor unit or attacking wires.
- Do not place anything in front of the indoor unit to ensure air circulation around the indoor unit.
- Do not locate anything under the indoor unit to be free from unexpected water out.
- In case of water pressure increasing to 3 bar, water drainage should be treated when water is drained by safety valve.

Service Space

- Ensure that the spaces indicated by arrows around bottom, side, and top side.
- Wider spaces are preferred for easy maintenance and piping.
- If minimum service space is not secured, air circulation can be troubled and internal parts of the indoor unit can be damaged by overheating.

NOTE

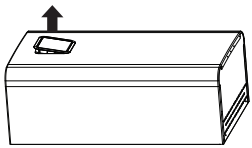
- The default setting of the product is for heating only. To use the cooling system together, DIP S / W 4 should be turned ON and additional drain pan accessory should be installed.



Minimum service space
(unit : mm)

Mounting to Wall

Step 1. Disconnect the remote control case from the front panel and disconnect the remote control cable.



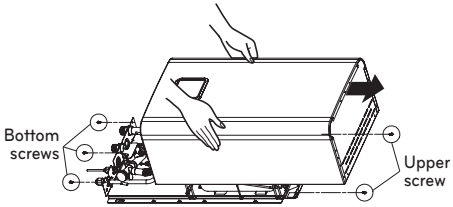
⚠ CAUTION

After installation is completed, return the remote control to its original state.

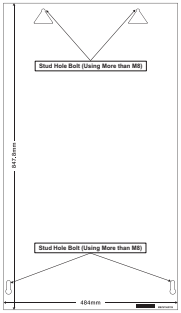
NOTE

Use a flat-blade screwdriver or a coin to remove the remote control case.

Step 2. After releasing five screws, detach front cover from the indoor unit. While detaching the front cover, grab the left and right sides of the front cover. Then pull into upward direction.



Step 3. Attach "Installation Sheet" to the wall and mark the location of bolts. This sheet helps to find correct location to the bolts.



⚠ CAUTION

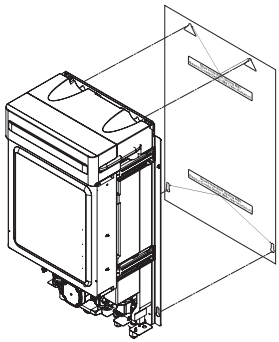
The sheet should be attached level. If not, the supporting plate and the indoor unit will not be mounted correctly.

Step 4. Detach the Installation sheet. Screw bolts at the hole marks on the wall.
When screwing bolts, use M8 ~ M11 anchor bolts to secure hanging the indoor unit.

NOTE

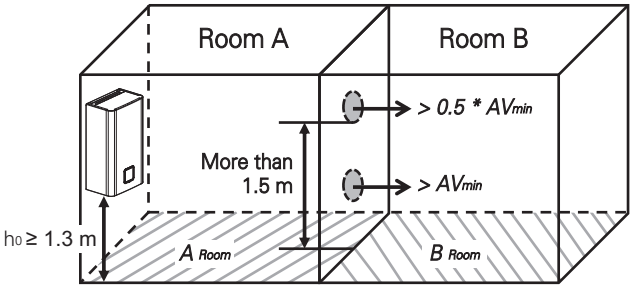
Self drilling screw can be used as alternatives of M8 ~ M11 anchor bolts. But M8 ~ M11 anchor bolts are more preferred.

Step 5. Hang the indoor unit at the supporting plate.



Floor area requirement : indoor unit (For R32 Split)

- If the total refrigerant charge (m_c) is in system ≥1.842 kg, additional minimum floor area requirements is complied in the following flow chart.



Determine :
- The total refrigerant charge in the system, m_c (kg)
- The room A area installed the appliance, A Room (m^2)

Calculate based on Table 1 :
- The maximum refrigerant charge allowed for room A_{max} (kg)

$m_{max} \geq m_c$ — No

Yes

The unit can be installed in room A without further room size or ventilation requirements.

Determine :
- The adjacent room B area, B Room (m^2)

Calculate based on Table 2 :
- The total minimum floor area required for the total refrigerant charge mc, A_{min} (m^2)

Amin ≥ A Room + B Room — No

Yes

Calculate based on Table 3 :
- The minimum opening area for natural ventilation between room A and room B according to the value of m_c and A Room, A_{min} (m^2)

The unit can be installed in room A when the following **ventilation requirements** are fulfilled.

please contact your local engineer / dealer.

Ventilation requirements

- Two ventilation openings, one at bottom, another at top, for ventilation purposes are made between room A and room B.
- **Bottom opening :**
  - Must comply to the minimum area requirement of AV_{min}.
  - Opening must be located 300 mm from the floor.
  - At least 50 % of required opening area must be 200 mm from the floor.
  - The bottom of the opening shall not be higher than the point of release when the unit is installed and must be situated 100 mm above the floor.
  - Must be as close as possible to the floor and lower than h_0. (h_0 = Installation height)
- **Top opening :**
  - The total size of the Top opening must be more than 50 % of AV_{min}.
  - Opening must be located 1 500 mm above the floor.
- The height of the openings between the wall and floor which connect the rooms are not less than 20 mm.
- Ventilation openings to the outside are NOT considered suitable ventilation openings (the user can block them when it is cold).

Table 1 - Maximum refrigerant charge allowed in a room

A_{room} (m^2)	Maximum refrigerant charge in a room m_{max} (kg)					
	Based on h_0 (m)					
	1.3	1.4	1.5	1.6	1.7	1.8
1	0.30	0.32	0.35	0.37	0.39	0.41
2	0.60	0.64	0.69	0.74	0.78	0.83
3	0.90	0.97	1.04	1.11	1.17	1.24
4	1.20	1.29	1.38	1.47	1.57	1.66
5	1.50	1.61	1.73	1.84	1.96	2.07
6	1.80	1.93	2.07	2.21	2.35	2.49
7	1.96	2.12	2.27	2.42	2.57	2.72
8	2.10	2.26	2.42	2.59	2.75	2.91
9	2.23	2.40	2.57	2.74	2.91	3.09
10	2.35	2.53	2.71	2.89	3.07	3.25
11	2.46	2.65	2.84	3.03	3.22	3.41
12	2.57	2.77	2.97	3.17	3.36	3.56
13	2.68	2.88	3.09	3.30	3.50	3.71
14	2.78	2.99	3.21	3.42	3.63	3.85
15	2.88	3.10	3.32	3.54	3.76	3.98
16	2.97	3.20	3.43	3.66	3.88	4.11
17	3.06	3.30	3.53	3.77	4.00	4.24
18	3.15	3.39	3.64	3.88	4.12	4.36

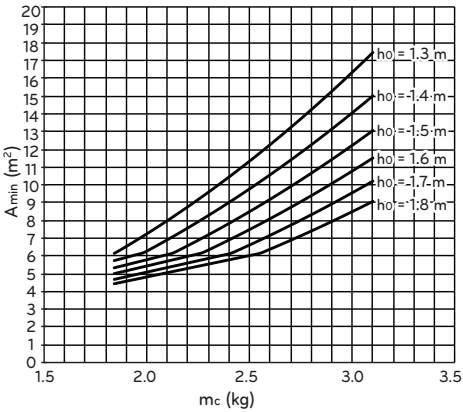
NOTE

- h_0 : Installation height, height measured from the bottom of the casing to the floor
- For intermediate $A_{room\ A}$ values, the value that corresponds to the lower $A_{room\ A}$ value from the table is considered.
  (If $A_{room\ A}$=10.5 m^2, consider the value that corresponds to $A_{room\ A}$ = 10 m^2.)

Table 2 - Minimum floor area

Total Ref. Amount m_c (kg)	Minimum Floor Area A_{min} (m^2) Based on h_0 (m)					
	1.3	1.4	1.5	1.6	1.7	1.8
1.84	6.15	5.71	5.33	4.99	4.70	4.44
1.86	6.27	5.77	5.39	5.05	4.75	4.49
1.88	6.41	5.83	5.44	5.10	4.80	4.54
1.90	6.54	5.89	5.50	5.16	4.85	4.58
1.92	6.68	5.96	5.56	5.21	4.91	4.63
1.94	6.82	6.02	5.62	5.27	4.96	4.68
1.96	6.96	6.08	5.67	5.32	5.01	4.73
1.98	7.11	6.14	5.73	5.37	5.06	4.78
2.00	7.25	6.25	5.79	5.43	5.11	4.83
2.02	7.40	6.38	5.85	5.48	5.16	4.87
2.04	7.54	6.51	5.91	5.54	5.21	4.92
2.06	7.69	6.63	5.96	5.59	5.26	4.97
2.08	7.84	6.76	6.02	5.65	5.31	5.02
2.10	8.00	6.89	6.08	5.70	5.37	5.07
2.12	8.15	7.03	6.14	5.75	5.42	5.12
2.14	8.30	7.16	6.24	5.81	5.47	5.16
2.16	8.46	7.29	6.35	5.86	5.52	5.21
2.18	8.62	7.43	6.47	5.92	5.57	5.26
2.20	8.77	7.57	6.59	5.97	5.62	5.31
2.22	8.93	7.70	6.71	6.03	5.67	5.36
2.24	9.10	7.84	6.83	6.08	5.72	5.40
2.26	9.26	7.98	6.96	6.13	5.77	5.45
2.28	9.42	8.13	7.08	6.22	5.82	5.50
2.30	9.59	8.27	7.20	6.33	5.88	5.55
2.32	9.76	8.41	7.33	6.44	5.93	5.60
2.34	9.93	8.56	7.46	6.55	5.98	5.65
2.36	10.10	8.71	7.58	6.67	6.03	5.69
2.38	10.27	8.85	7.71	6.78	6.08	5.74
2.40	10.44	9.00	7.84	6.89	6.13	5.79
2.42	10.62	9.15	7.97	7.01	6.21	5.84
2.44	10.79	9.31	8.11	7.13	6.31	5.89
2.46	10.97	9.46	8.24	7.24	6.42	5.94
2.48	11.15	9.61	8.38	7.36	6.52	5.98
2.50	11.33	9.77	8.51	7.48	6.63	6.03
2.52	11.51	9.93	8.65	7.60	6.73	6.08
2.54	11.70	10.09	8.79	7.72	6.84	6.13
2.56	11.88	10.24	8.92	7.84	6.95	6.20
2.58	12.07	10.41	9.06	7.97	7.06	6.29
2.60	12.26	10.57	9.21	8.09	7.17	6.39
2.62	12.44	10.73	9.35	8.22	7.28	6.49
2.64	12.64	10.89	9.49	8.34	7.39	6.59
2.66	12.83	11.06	9.64	8.47	7.50	6.69
2.68	13.02	11.23	9.78	8.60	7.61	6.79
2.70	13.22	11.40	9.93	8.72	7.73	6.89
2.72	13.41	11.57	10.07	8.85	7.84	7.00
2.74	13.61	11.74	10.22	8.99	7.96	7.10
2.76	13.81	11.91	10.37	9.12	8.08	7.20
2.78	14.01	12.08	10.52	9.25	8.19	7.31
2.80	14.21	12.26	10.68	9.38	8.31	7.41

Total Ref. Amount m_c (kg)	Minimum Floor Area A_{min} (m^2) Based on h_0 (m)					
	1.3	1.4	1.5	1.6	1.7	1.8
2.82	14.42	12.43	10.83	9.52	8.43	7.52
2.84	14.62	12.61	10.98	9.65	8.55	7.63
2.86	14.83	12.79	11.14	9.79	8.67	7.74
2.88	15.04	12.97	11.29	9.93	8.79	7.84
2.90	15.25	13.15	11.45	10.07	8.92	7.95
2.92	15.46	13.33	11.61	10.20	9.04	8.06
2.94	15.67	13.51	11.77	10.34	9.16	8.17
2.96	15.88	13.70	11.93	10.49	9.29	8.29
2.98	16.10	13.88	12.09	10.63	9.41	8.40
3.00	16.32	14.07	12.26	10.77	9.54	8.51
3.02	16.53	14.26	12.42	10.92	9.67	8.62
3.04	16.75	14.45	12.58	11.06	9.80	8.74
3.06	16.98	14.64	12.75	11.21	9.93	8.85
3.08	17.20	14.83	12.92	11.35	10.06	8.97
3.10	17.42	15.02	13.09	11.50	10.19	9.09



NOTE

- h_0 : Installation height, height measured from the bottom of the casing to the floor
- For intermediate m_c values, the value that corresponds to the higher mc value from the table is considered. (If m_c = 1.85 kg, the value that corresponds to m_c = 1.86 kg is considered.)
- Systems with total refrigerant charge lower than 1.84 kg are not subjected to any room area requirements.
- Charges above 3.10 kg are not allowed in the unit.

Table 3 - Minimum venting opening area for natural ventilation

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.3 m) Total Ref. Amount m_c (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	770	742	715	687	660	632	605	577	550	522	495	467	440
2	687	660	632	605	578	550	523	495	468	440	413	385	358
3	605	578	550	523	495	468	440	413	385	358	330	303	275
4	523	495	468	440	413	386	358	331	303	276	248	221	193
5	441	413	386	358	331	303	276	248	221	193	166	138	111
6	358	331	303	276	248	221	193	166	139	111	84	56	29
7	322	294	265	237	209	180	152	123	95	67	38	10	
8	293	264	235	205	176	147	117	88	58	29			
9	263	233	203	173	143	112	82	52	22				
10	233	202	171	140	109	78	47	16					
11	202	171	139	107	75	43	12						
12	171	139	106	74	41	9							
13	140	107	74	40	7								
14	108	75	41	7									
15	77	42	8										
16	45	10											
17	13												

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.4 m) Total Ref. Amount m_c (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	736	709	683	656	630	603	577	550	524	497	471	444	418
2	650	624	597	571	544	518	491	465	438	412	385	359	332
3	565	538	512	485	459	432	406	379	353	327	300	274	247
4	480	453	427	400	374	347	321	294	268	241	215	188	162
5	394	368	341	315	288	262	235	209	182	156	129	103	76
6	309	282	256	229	203	176	150	123	97	70	44	17	
7	269	242	214	187	160	132	105	78	50	23			
8	237	209	180	152	124	96	67	39	11				
9	204	175	146	117	88	58	29						
10	171	141	111	81	51	21							
11	137	106	76	45	14								
12	103	72	40	9									
13	69	37	5										
14	35	2											
15	1												

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.5 m)												
	Total Ref. Amount m_c (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	705	679	654	628	602	577	551	526	500	475	449	423	398
2	616	591	565	540	514	488	463	437	412	386	361	335	309
3	528	502	477	451	426	400	375	349	323	298	272	247	221
4	440	414	389	363	337	312	286	261	235	209	184	158	133
5	351	326	300	275	249	223	198	172	147	121	95	70	44
6	263	237	212	186	161	135	109	84	58	33	7	70	
7	220	194	167	141	114	88	61	35	9				
8	185	157	130	103	75	48	21						
9	149	121	93	64	36	8							
10	113	84	55	26									
11	76	47	17										
12	40	10											
13	3												

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.6 m)												
	Total Ref. Amount m_c (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	677	652	627	602	578	553	528	503	479	454	429	404	379
2	585	561	536	511	486	462	437	412	387	362	338	313	288
3	494	469	445	420	395	370	346	321	296	271	246	222	197
4	403	378	353	329	304	279	254	229	205	180	155	130	106
5	312	287	262	237	213	188	163	138	113	89	64	39	14
6	220	196	171	146	121	97	72	47	22				
7	174	149	123	98	72	46	21						
8	136	110	83	57	30	4							
9	97	70	43	16									
10	59	31	3										
11	20												

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.7 m)												
	Total Ref. Amount mc (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	651	627	603	579	555	531	507	483	459	435	411	387	363
2	557	533	509	485	461	437	413	389	365	341	317	293	268
3	463	439	415	391	367	343	319	295	271	247	222	198	174
4	369	345	321	297	273	249	225	201	176	152	128	104	80
5	275	251	227	203	179	155	130	106	82	58	34	10	
6	181	157	133	108	84	60	36	12					
7	132	107	82	57	32	8							
8	91	65	39	14									
9	49	23											
10	8												

A_{room} (m^2)	Minimum opening area Anv_{min} (cm^2) (Based on h_0 1.8 m)												
	Total Ref. Amount m_c (kg)												
	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1	627	604	581	557	534	510	487	464	440	417	394	370	347
2	530	507	484	460	437	414	390	367	344	320	297	274	250
3	434	410	387	364	340	317	294	270	247	223	200	177	153
4	337	313	290	267	243	220	197	173	150	127	103	80	57
5	240	217	193	170	147	123	100	77	53	30	6		
6	143	120	97	73	50	26	3						
7	91	67	43	19									
8	48	23											
9	4												

NOTE

- h_0 : Installation height, height measured from the bottom of the casing to the floor
- For intermediate $A_{room\ A}$ values, the value that corresponds to the lower $A_{room\ A}$ value from the table is considered.
  (If $A_{room\ A}$ = 10.5 m^2, consider the value that corresponds to $A_{room\ A}$ = 10 m^2.)
- For intermediate m_c values, the value that corresponds to the higher m_c value from the table is considered. (If m_c = 2.15 kg, the value that corresponds to m_c = 2.2 kg is considered.)

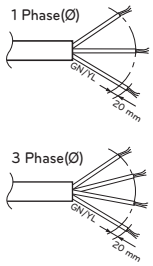
Electrical Wiring

Two kind of cables should be connected to the outdoor unit : One is 'Power cable', the other one is 'Connecting cable'. Power cable is a cable which is used to supply external electricity to the outdoor unit. This cable is generally connected between external power source (such as main electric power distribution panel of user's house) and the outdoor unit. Connecting cable is, on the other hand, used to connect between the outdoor unit and the indoor unit to supply electric power to the indoor unit and to establish the communication between the outdoor unit and the indoor unit.

Procedure for wiring to the outdoor unit is four steps. Before starting wiring, check if wire specification is suitable and read following directions and cautions VERY carefully.

⚠ CAUTION

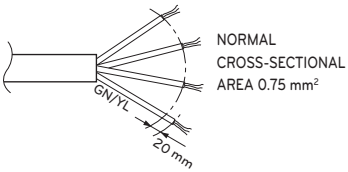
The power cord connected to the outdoor unit should be complied with IEC 60245 or HD 22.4 S4 (This equipment shall be provided with a cord set complying with the national regulation.)



NORMAL CROSS-SECTIONAL AREA

Model Name		Area (mm^2)	Cable Type
Phase (Ø)	Capacity (kW)		
1	5	4	H07RN-F
	7		
	9		
	12	6	
	14		
	16		
3	12	2.5	
	14		
	16		

The connecting cable connected to the outdoor unit should be complied with IEC 60245 or HD 22.4 S4 (This equipment shall be provided with a cord set complying with the national regulation.)



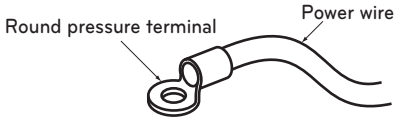
When the connection line between the indoor unit and outdoor unit is over 40 m, connect the telecommunication line and power line separately.

In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

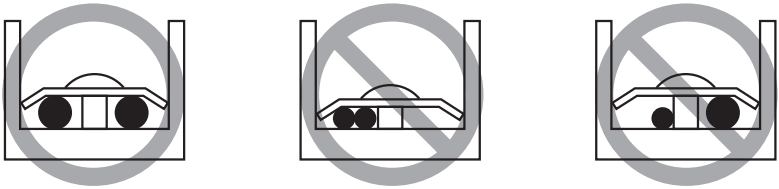
Precautions when laying power wiring

Use round pressure terminals for connections to the power terminal block.



When none are available, follow the instructions below.

- Do not connect wiring of different thicknesses to the power terminal block. (Slack in the power wiring may cause abnormal heat.)
- When connecting wiring which is the same thickness, do as shown in the figure below.



- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal block.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.

⚠ WARNING

Make sure that the screws of the terminal are free from looseness.

Point for attention regarding quality of the public electric power supply

This equipment complies with respectively:

- EN/IEC 61000-3-12 (1) provided that the short-circuit power Ssc is greater than or equal to the minimum Ssc value at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with respectively: Ssc greater than or equal to the minimum Ssc value.

Model Name		Minimum Ssc Value
Phase (Ø)	Capacity (kW)	
1	5	3 142
	7	
	9	
	12	
	14	
	16	

Model Name		Minimum Ssc Value
Phase (Ø)	Capacity (kW)	
3	12	2 348
	14	
	16	

- European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 75 A.
- European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current ≤16 A of > 75 A per phase.

Circuit Breaker Specification

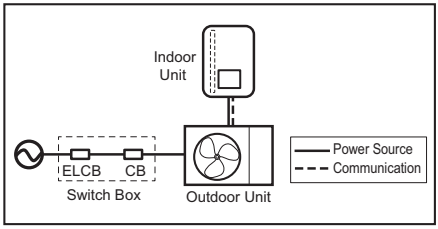
Perform the electrical wiring work according to the electrical wiring connection.

- All wiring must comply with local requirements.
- Select a power source that is capable of supplying the current required by the unit.
- Use a recognized ELCB(Electric Leakage Circuit Breaker) between the power source and the unit. A disconnection device to adequately disconnect all supply lines must be fitted.
- Model of circuit breaker recommended by authorized personnel only

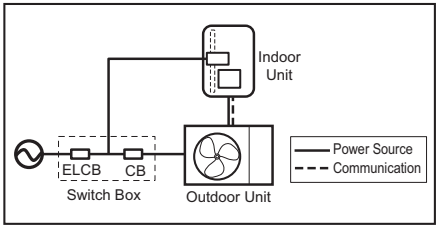
*Pipes and wires should be purchased separately for installation of the product.

Heat Pump							Backup Heater				
Type	Refrigerant	Indoor Unit Series	Phase [Ø]	Capacity [kW]	Power Supply	Outdoor Unit ELCB [A]	Phase [Ø]	Capacity [kW]	Power Supply	Area [mm^2]	ELCB [A]
Split	R32	4	1	5 / 7 / 9	220-240 V~50 Hz	16 / 20 / 25	1	6 (3+3)	220-240 V~50 Hz	4	40
		5									
	R410A	3	1	5 / 7 / 9	220-240 V~50 Hz	30	1	6 (3+3)	220-240 V~50 Hz	4	40
			1	12 / 14 / 16		40	1	6 (3+3)		6	40
			3	12 / 14 / 16	380-415 V~50 Hz	20	3	9 (3+3+3)	380-415 V~50 Hz	2.5	32
		5	1	12 / 14 / 16	220-240 V~50 Hz	40	1	6 (3+3)	220-240 V~50 Hz	6	40
			3	12 / 14 / 16	380-415 V~50 Hz	20	3	6 (2+2+2)	380-415 V~50 Hz	2.5	32
Hydrosplit	R32	0	1	12 / 14 / 16	220-240 V~50 Hz	40	1	-	-	-	-
			3	12 / 14 / 16	380-415 V~50 Hz	16	3	-	-	-	-

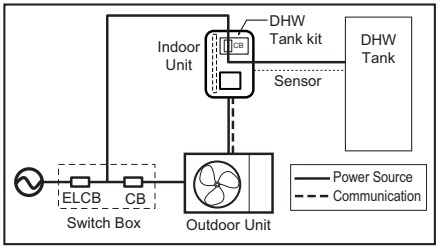
- Power Supply for Heat Pump



- Power Supply for Backup Heater



- Power Supply for DHW Booster Heater



PIPING AND WIRING FOR OUTDOOR UNIT

Procedures about refrigerant piping and electric wiring at the outdoor are described in this chapter. Most of procedures are similar to those of LG Air Conditioner.
*Pipes and wires should be purchased separately for installation of the product.

(For Split)

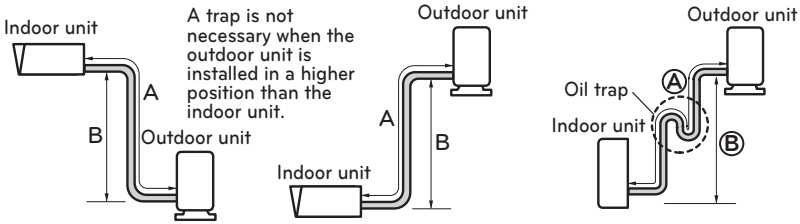
*In the case of Hydrosplit Model, there is no refrigerant piping

Refrigerant Piping

Before starting refrigerant piping, constraints in pipe length and elevation should be examined. After resolving all constraints, some preparations are required to proceed. Then connecting pipe to the outdoor and the indoor unit is beginning.

Constraints in Pipe Length and Elevation

Refrigerant	Capacity (kW)	Pipe Diameter [mm(inch)]		Length A (m)		Elevation B (m)	Additional Refrigerant (g/m)
		Gas	Liquid	Standard	Max.	Max.	
R410A	5/7/9/12/14/16	15.88(5/8")	9.52(3/8")	7.5	50	30	40
R32	5/7/9	15.88(5/8")	9.52(3/8")	5	50	30	40



⚠ CAUTION

1 For R410A products, If the pipe length is longer than 7.5 m, additional charge of the refrigerant is required according to the table.
   • Example : If 16 kW model is installed at a distance of 50 m, 1 700 g of refrigerant should be added according to following formula : (50-7.5) x 40 g = 1 700 g
2 For R32 products, If the pipe length is longer than 10 m, additional charge of the refrigerant is required according to the table.
   • Example : If R32 9 kW model is installed at a distance of 50 m, 1 600 g of refrigerant should be added according to following formula : (50-10) x 40 g = 1600 g
3 Rated capacity of the product is based on standard length and maximum allowable length is based on the product reliability in the operation.
4 Improper refrigerant charge may result in abnormal operation.
5 Oil trap should be installed every 10 meters.

NOTE

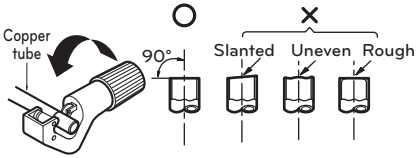
Fill in the f-gas Label attached on outdoor about the quantity of the fluorinated greenhouse gases (This note about f-gas label may not apply depending on your product type or market.)
① Manufacturing site (See Model Name label)
② Installation site (If possible being placed adjacent to the service points for the addition or removal of refrigerant)
③ The total Charge (① + ②)

Preparation for Piping

- Main cause of gas leakage is defect in flaring work. Carry out correct flaring work in the following procedure.
- Use the de-oxidised copper as piping materials to install.

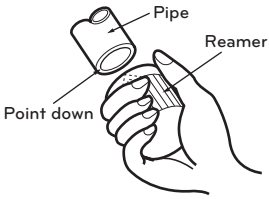
Step 1. Cut the pipes and the cable.

- Use the accessory piping kit or the pipes purchased locally.
- Measure the distance between the indoor unit and the outdoor unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable 1.5 m longer than the pipe length.



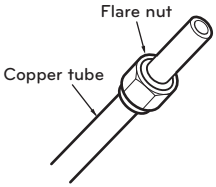
Step 2. Burrs removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the tubing.



Step 3. Putting nut on

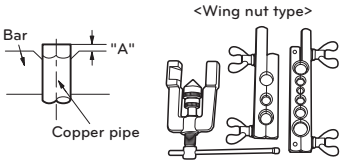
- Remove flare nuts attached to indoor and outdoor units, than put them on pipe/tube having completed burr removal. (Not possible to put them on after flaring work)

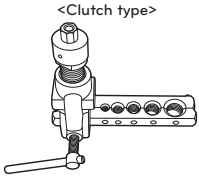


Step 4. Flaring work.

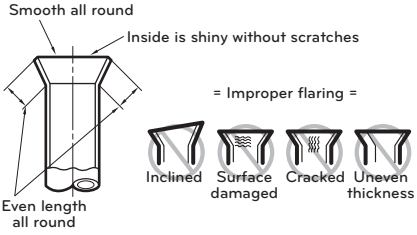
- Carry out flaring work using dedicated flaring tool for R-410A refrigerant as shown below.

Pipe diameter [inch(mm)]	A inch (mm)	
	Wing nut type	Clutch type
1/4 (6.35)	0.04~0.05(1.1~1.3)	0~0.02 (0~0.5)
3/8 (9.52)	0.06~0.07(1.5~1.7)	
1/2 (12.7)	0.06~0.07(1.6~1.8)	
5/8 (15.88)	0.06~0.07(1.6~1.8)	
3/4 (19.05)	0.07~0.08(1.9~2.1)	





- Firmly hold copper tube in a bar(or die) as indicated dimension in the table above.



Step 5. Check

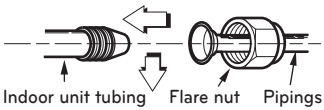
- Compare the flared work with right figure.
- If flare is seemed to be defective, cut off the flared section and do flaring work again.

Connecting Pipe to Indoor Unit

Connecting pipe to the indoor unit is two steps. Read following directions carefully.

Step 1. Pre-tightening.

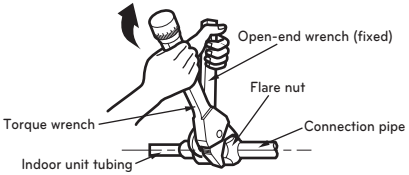
- Align the center of the pipes and sufficiently tighten the flare nut by hand.



Step 2. Tightening.

- Tighten the flare nut with a wrench.
- Tightening torque is as following.

Outside diameter [mm(inch)]	Torque [kgf·m]
6.35 (1/4)	1.8 ~ 2.5
9.52 (3/8)	3.4 ~ 4.2
12.7 (1/2)	5.5 ~ 6.6
15.88 (5/8)	6.6 ~ 8.2
19.05 (3/4)	9.9 ~ 12.1



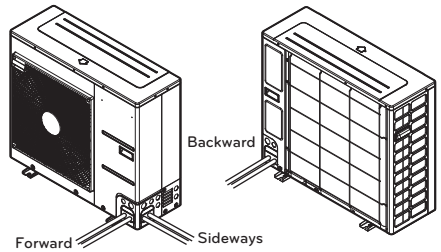
Connecting Pipe to Outdoor Unit

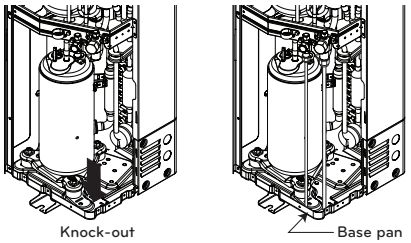
Connecting pipe to the outdoor unit is five steps including PCB setting.

Step 1. Determine direction of pipes.

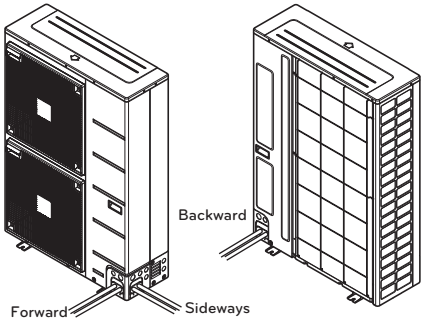
- The pipes can be connectable in three directions.
- The directions are expressed in below figure.
- When connecting in a downward direction, knock out the knock-out hole of the base pan.
- Detailed geometry may vary by model.

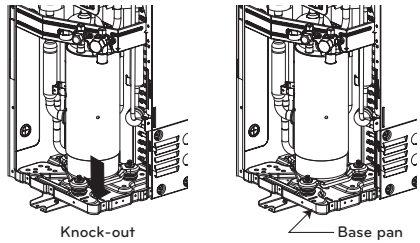
Product Heating Capacity : 5 kW, 7 kW, 9 kW





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

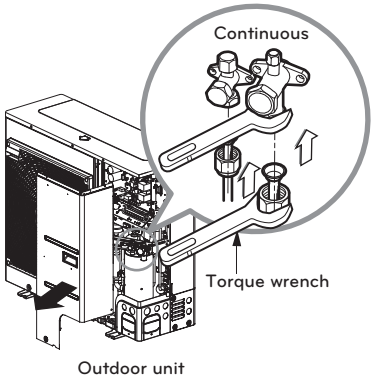




Step 2. Tightening

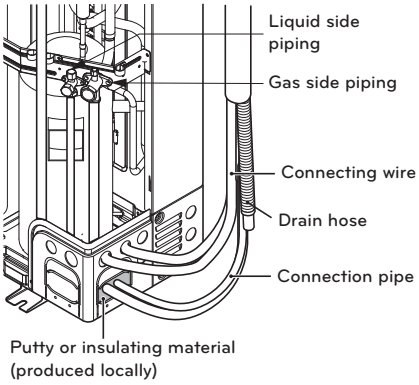
- Align the center of the pipes and sufficiently tighten the flare nut by hand.
- Tighten the flare nut with a wrench until the wrench clicks.
- Tightening torque is as following.

Outside diameter [mm(inch)]	Torque [kgf·m]
6.35 (1/4)	1.8 ~ 2.5
9.52 (3/8)	3.4 ~ 4.2
12.7 (1/2)	5.5 ~ 6.6
15.88 (5/8)	6.6 ~ 8.2
19.05 (3/4)	9.9 ~ 12.1



Step 3. Preventing entering of foreign objects

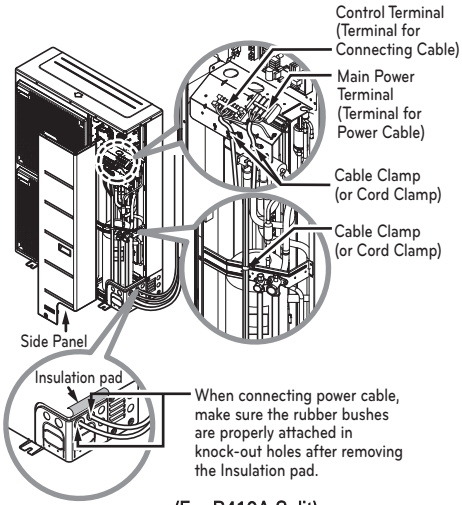
- Plug the pipe through-holes with putty or insulation material (procured locally) to fill up all gaps as shown in right figure.
- If insects or small animals enter the outdoor unit, it may cause a short circuit in the electrical box.
- Finally, form the pipes by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tape. Ensuring thermal insulation is very important.



Wiring Procedure for Power Cable and Connecting Cable

Step 1. : Disassemble the side panel from the outdoor unit by loosing screws.

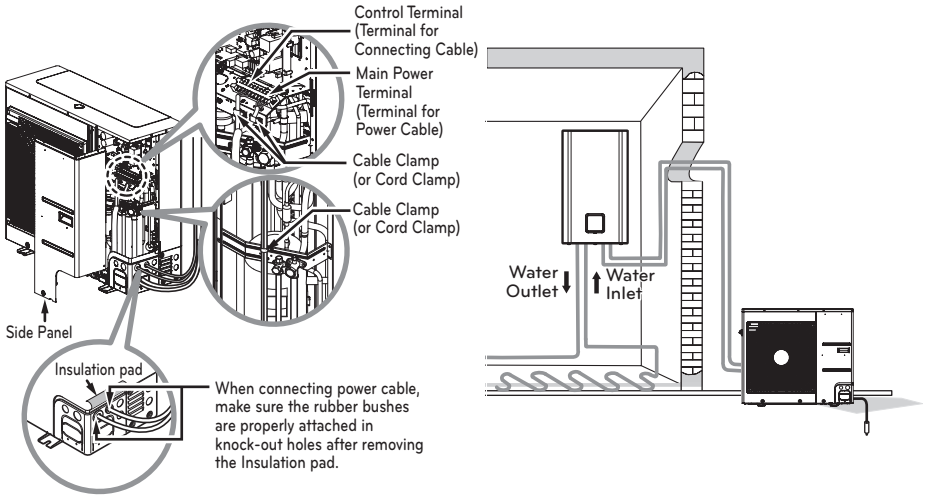
Step 2. : Connect Power cable to Main Power Terminal and Connecting cable to Control Terminal, respectively. See below figure for detailed information. When connecting earth cable, the diameter of cable should be bigger than 1.6 mm^2 to secure safety. The earth cable is connected to the terminal block where earth symbol ⏚ is marked.



(For R410A Split)

Step 3. : Use cable clamps (or cord clamps) to prevent unintended move of Power cable and Connecting cable.

Step 4. : Reassemble the side panel to the outdoor unit by fastening screws.



(For R32 Split)

⚠ CAUTION

After checking and confirming following conditions, start wiring work.

- Secure dedicated power source for the Air-to-Water heat pump. The wiring diagram (attached inside the control box of the indoor unit) is presenting related information.
- Provide a circuit breaker switch between power source and the outdoor unit.
- Although it is very rare case, sometimes the screws used to fasten internal wires can be loosen due to the vibration while product transportation. Check these screws and make it sure if they are all fastened tightly. If not tightened, burn-out of the wire can be occurred.
- Check the specification of power source such as phase, voltage, frequency, etc.
- Confirm that electrical capacity is sufficient.
- Be sure that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- Confirm that the cable thickness is as specified in the power sources specification. (Particularly note the relation between cable length and thickness.)
- Provide an ELB(electric leakage breaker) when the installation place is wet or moist.
- The following troubles would be caused by abnormal voltage supply such as sudden voltage increasing or voltage drop-down.
  - Chattering of a magnetic switch. (frequent on and off operation.)
  - Physical damage of parts where magnetic switch is contacted.
  - Break of fuse.
  - Malfunction of overload protection parts or related control algorithms.
  - Failure of compressor start up.
- Ground wire to ground outdoor unit to prevent electrical shock.

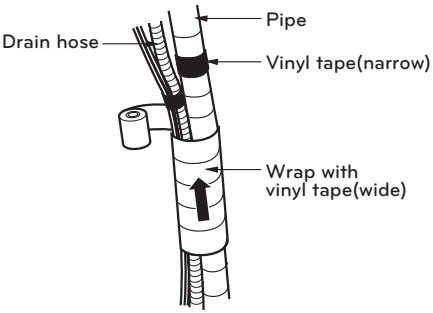
⚠ CAUTION

The Power cord connected to the unit should be selected according to the following specifications.

Finalizing

After pipes are connected and electric cables are wired, pipe forming and some tests are remained. Especially, careful attention is required while proceeding leakage test because the leakage of the refrigerant effects degrade of performance directly. Also, it is very hard to find leaked point after all installation procedures are finished.

Pipe Forming

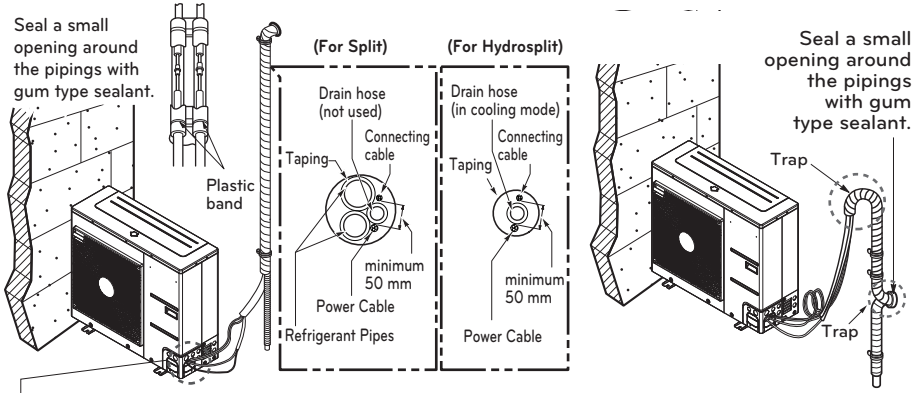


Do pipe forming by wrapping the connecting cable and refrigerant pipe (between the indoor unit and outdoor unit) with thermal insulation material and secure it with two kinds of vinyl tape.

- Tape the refrigerant pipe, power cable and connecting cable from down to up.
- Secure the taped pipe is along with the exterior wall. Form a trap to prevent water entering the room and electrical part.
- Fix the taped pipe onto the wall by saddle or equivalent.

Taping Procedure

- Tape the pipes, connecting cable and power cable from down to up. If taping direction is up to down, rain drop may be sinking into the pipes or cables.
- Secure the taped pipe along the exterior wall using saddle or equivalent.
- Trap is required to prevent water from entering into electrical parts.



• Trap is required to prevent water from entering into electrical parts.

Leakage test and Evacuation

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

- Pressure in the system rises.
- Operating current rises.
- Cooling(or heating) efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor/outdoor unit and connecting tube must be checked for leak tight, and vacuumed to remove incondensable gas and moisture in the system.

Preparation

- Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Check that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

Leakage test

- Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

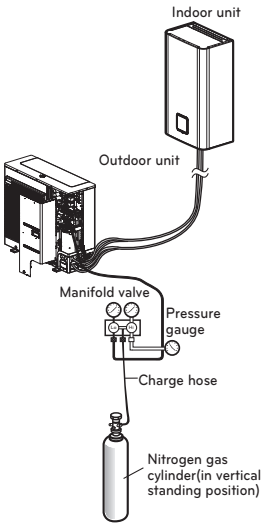
⚠ CAUTION

Be sure to use a manifold valve for leakage test. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept close.

- Pressurize the system to no more than 3.0 MPa with dry nitrogen gas and close the cylinder valve when the gauge reading reached 3.0 MPa Next, test for leaks with liquid soap.

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

- Do a leakage test of all joints of the tubing(both indoor and outdoor) and both gas and liquid side service valves. Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth
- After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.

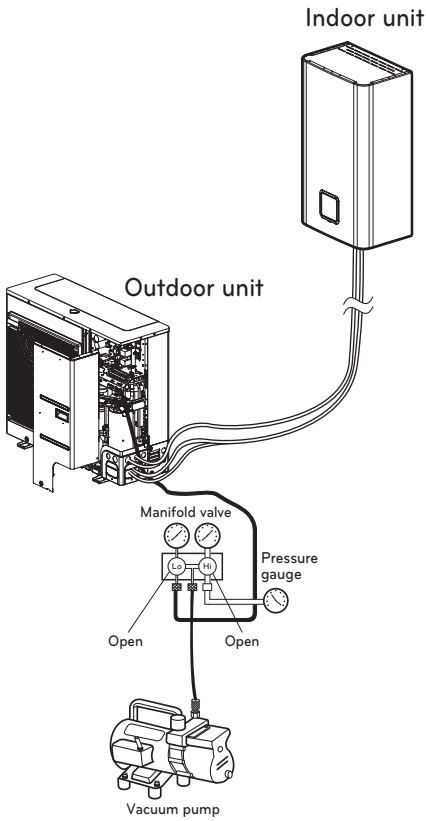


Evacuation

- Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm the "Lo and Hi" knob of the manifold valve is open. Then, run the vacuum pump. The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.

Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 10 m(33 ft)	If tubing length is longer than 10 m(33 ft)
30 min. or more	60 min. or more
0.8 torr or less	

- When the desired vacuum is reached, close the "Lo and Hi" knob of the manifold valve and stop the vacuum pump.



Finishing the job

- With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
- Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
- Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
- Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
- Replace the valve caps at both gas and liquid side service valves and fasten them tight. This completes air purging with a vacuum pump.

THERMA V. is now ready to test run.

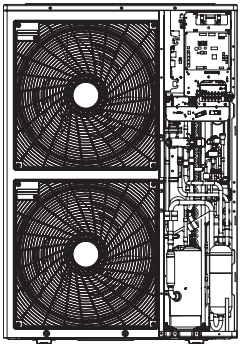
Wiring Procedure for Power Cable and Connecting Cable

(For Hydrosplit)

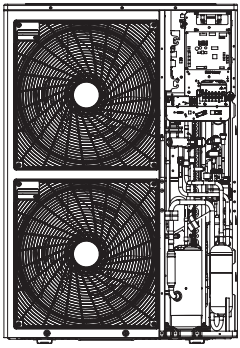
This cable is generally connected between external power source (such as main electric power distribution panel of user's house) and the unit. Before starting wiring, check if wire specification is suitable and read following directions and cautions VERY carefully.

Step 1. : Disassemble side panel and front panel from the unit by loosing screws.

- 1Ø



- 3Ø

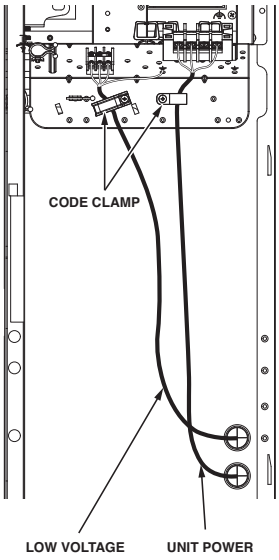


Step 2. : Connect power cable to main power terminal
See below figure for detailed information. When connecting earth cable, the diameter of cable should be refer to the below table. The earth cable is connected to the Control box case where earth symbol is ⏚ marked.

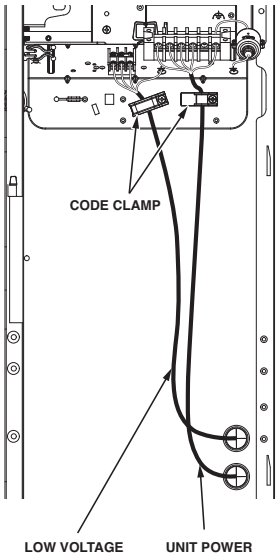
Step 3. : Use cable clamps (or cord clamps) to prevent unintended move of power cable.

Step 4. : Reassemble the side panel to the unit by fastening screws.

- 1Ø



- 3Ø



Failure to do these instruction can result in fire, electric shock or death.

- Make sure the power cable do not touch to copper tube.
- Make sure to fix [cord clamp] firmly to sustain the connection of terminal.
- Make sure to connect unit power & heater power separately.

Electrical Wiring

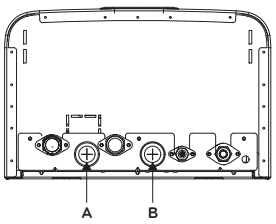
General Consideration

Followings are should be considered before beginning indoor unit wiring.

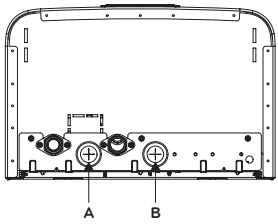
- Field-supplied electrical components such as power switches, circuit breakers, wires, terminal boxes, etc should be properly chosen with compliance with national electrical legislation or regulation.
- Make it sure that supplied electricity is enough to operate the product including outdoor unit, electric heater, water tank heater, etc. The capacity of fuse also selected according to the power consumption.
- The main electricity supply should be dedicated line. Sharing main electricity supply with other devices such as washing machine or vacuum cleaner is not permitted.

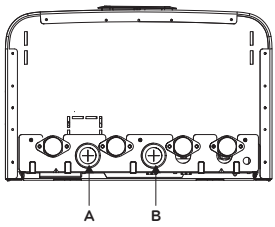
⚠ CAUTION

- Before starting wiring job, the main electricity supply should be turned off until wiring is completed.
- When adjusting or changing wiring, the main electricity supply should be turned off and ground wire should be connected securely.
- Installation place should be free from the attack of wild animal. For example, mice's wire attacking or frog's entering into the indoor unit may cause critical electrical accident.
- All power connections should be protected from dew condensation by thermal insulation.
- All electrical wiring should comply with national or local electrical legislation or regulation.
- The ground should be connected exactly. Do not earth the product to the copper pipe, steel fence at the veranda, city water outlet pipe, or any other conductivity materials.
- Fix all cable using cord clamp tightly. (When cable is not fixed with cord clamp, use additionally supplied cable ties.)



(For Split)





(For Hydrosplit)

Hole A : For DC line (wire which is connected to the PCB of the control box)

Hole B : For AC line (wire which is connected to the terminal block of the control box)

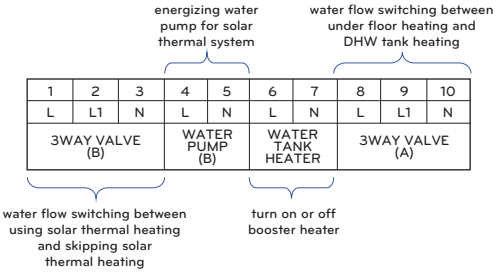
Terminal Block Information

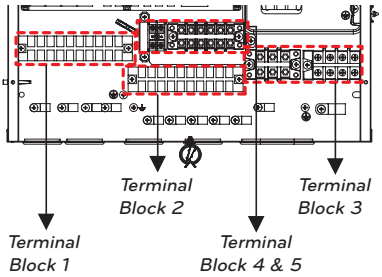
(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)

Symbols used below pictures are as follows :

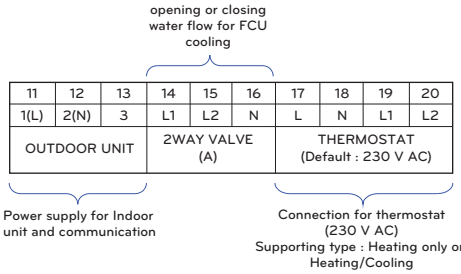
- L, L1, L2 : Live (230 V AC)
- N : Neutral (230 V AC)
- BR : Brown, WH : White, BL : Blue, BK : Black

Terminal Block 1

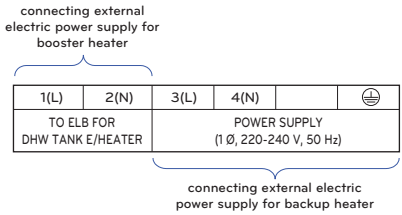




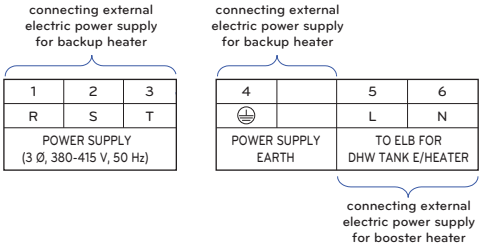
Terminal Block 2



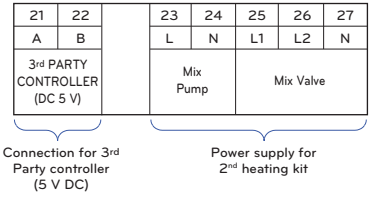
Terminal Block 3 (1Ø Backup Heater)



Terminal Block 3 (3Ø Backup Heater)



Terminal Block 4 & 5



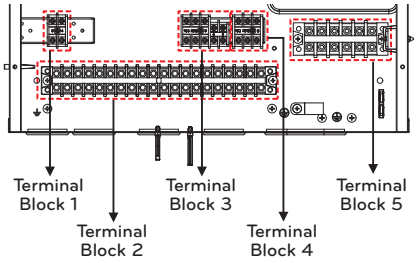
Terminal Block Information

(For Split Indoor unit 5 series, Hydrosplit 2-Pipe)

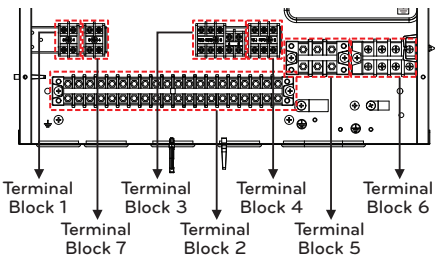
Symbols used below pictures are as follows :

- L, L1, L2 : Live (230 V AC)
- N : Neutral (230 V AC)
- BR : Brown, WH : White, BL : Blue, BK : Black

For 1Ø



For 3Ø



Terminal Block 1 ~ 4

Connection for 3rd Party controller (5 V DC)

21	22
A	B
3rd PARTY CONTROLLER (5V DC)	

Connection for thermostat (230 V AC) Supporting type : Heating only or Heating/Cooling

23	24	25	26	27
L	N	L1	L2	L3
THERMOSTAT (Default : 230 V AC)				

Water flow switching between using solar thermal heating and skipping solar thermal heating

18	19	20
L	L1	N
3WAY VALVE (B)		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	N	L	N	L	N	L	N	L1	L2	N	L	L1	N	L1	L2	N	1(L)	2(N)	3
WATER TANK HEATER				WATER PUMP (B)		MIX PUMP		MIX VALVE			3WAY VALVE (A)			2WAY VALVE (A)			OUTDOOR UNIT		

- Turn on or off booster heater
- energizing water pump for solar thermal system
- Power supply for 2nd heating kit
- Water flow switching between under floor heating and DHW tank heating
- Opening or closing water flow for FCU cooling
- Power supply for Indoor unit and communication

Terminal Block 5 (For 1Ø)

TO ELB FOR DHW TANK E/HEATER	POWER SUPPLY (1 Ø, 220-240 V, 50 Hz)

- connecting external electric power supply for booster heater
- connecting external electric power supply for backup heater

Terminal Block 5 (For 3Ø)

R	S	T
POWER SUPPLY (3 Ø, 380-415 V, 50 Hz)		

- connecting external electric power supply for backup heater

Terminal Block 6 (For 3Ø)

⏚		L	N
POWER SUPPLY EARTH		TO ELB FOR DHW TANK E/HEATER	

- Connecting external electric power supply for backup heater
- Connecting external electric power supply for backup heater

Terminal Block Information

(For Hydrosplit 1-Pipe)

Symbols used below pictures are as follows :

- L, L1, L2, L3 : Live (230 V AC)
- N : Neutral (230 V AC)
- BR : Brown, WH : White, BL : Blue, BK : Black

Terminal Block 1

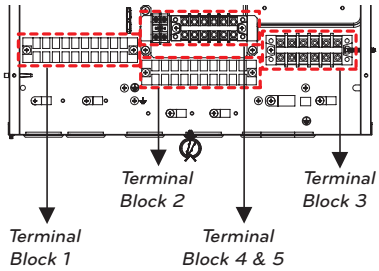
energizing water pump for solar thermal system

water flow switching between under floor heating and DHW tank heating

1	2	3	4	5	6	7	8	9	10
L	L1	N	L	N	L	N	L	L1	N
3WAY VALVE (B)			WATER PUMP (B)		WATER TANK HEATER		3WAY VALVE (A)		

water flow switching between using solar thermal heating and skipping solar thermal heating

turn on or off booster heater



Terminal Block 2

opening or closing water flow for FCU cooling

11	12	13	14	15	16	17	18	19	20
1(L)	2(N)	3	L1	L2	N	L	N	L1	L2
OUTDOOR UNIT			2WAY VALVE (A)			THERMOSTAT (Default : 230 V AC)			

Power supply for Indoor unit and communication

Connection for thermostat (230 V AC)
Supporting type : Heating only or Heating/Cooling

Terminal Block 3 (1Ø Backup Heater)

connecting external electric power supply for booster heater

1	2	3	4	5	6
L	N	R(L)			N
TO ELB FOR DHW TANK E/HEATER		POWER SUPPLY (1 Ø, 220-240 V, 50 Hz) (3 Ø, 380-415 V, 50 Hz)			

connecting external electric power supply for backup heater

Terminal Block 3 (3Ø Backup Heater)

connecting external electric power supply for booster heater

1	2	3	4	5	6
L	N	R(L)	S	T	N
TO ELB FOR DHW TANK E/HEATER		POWER SUPPLY (1 Ø, 220-240 V, 50 Hz) (3 Ø, 380-415 V, 50 Hz)			

connecting external electric power supply for backup heater

Terminal Block 4 & 5

21	22		23	24	25	26	27	28
A	B		L	N	L1	L2	N	L3
3rd PARTY CONTROLLER (DC 5 V)			Mix Pump		Mix Valve			THERMOSTAT

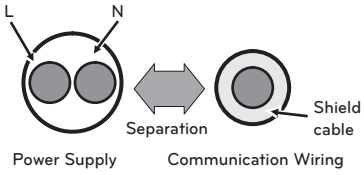
Connection for 3rd Party controller (5 V DC)

Power supply for 2nd heating kit

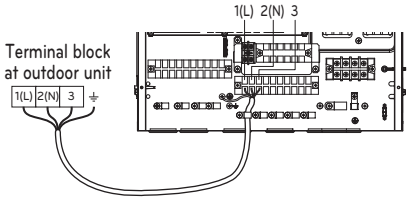
Connection for thermostat (230 V AC)
Supporting type : DHW Heating

⚠ CAUTION

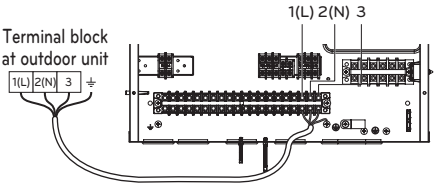
You should separate the communication wiring, in case of communication wiring length is over 40 M.



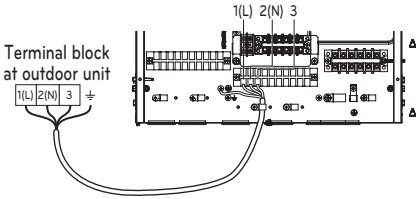
Connecting with Outdoor Unit



(For Split R410A Indoor unit 3 Series, For Split R32 Indoor unit 4 Series)



(For Split Indoor unit 5 Series)



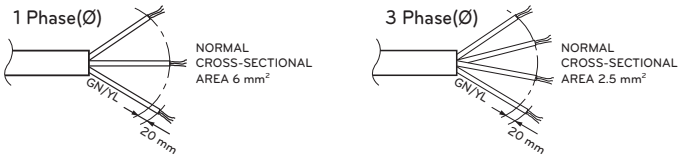
(For Hydrosplit)

The feature may be changed according to the type of model.

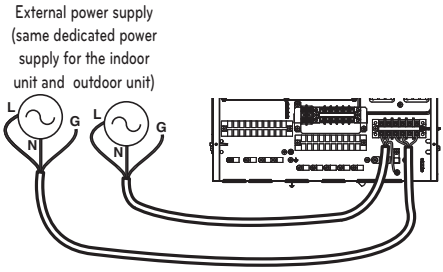
Backup Heater Wiring

⚠ CAUTION

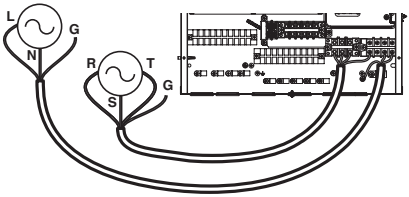
Power Cable Specification : The power cord connected to the outdoor unit should be complied with IEC 60245 or HD 22.4 S4(Rubber insulated cord, type 60245 IEC 66 or H07RN-F)



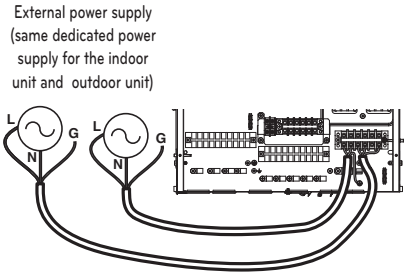
If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.



1Ø Backup Heater
(For Split R410A Indoor unit 3 Series)



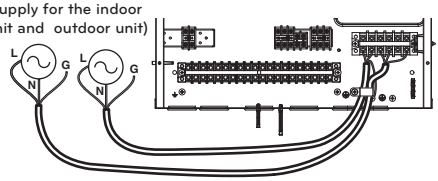
3Ø Backup Heater
(For Split R410A Indoor unit 3 Series)



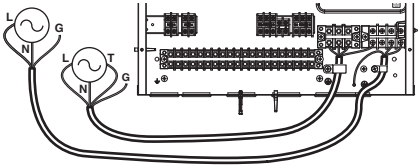
1Ø Backup Heater
(For Split R32 Indoor unit 4 Series)

⚠ CAUTION

External power supply
(same dedicated power
supply for the indoor
unit and outdoor unit)

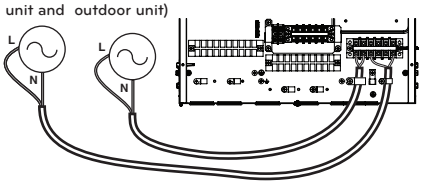


1Ø Backup Heater
(For Split R410A Indoor unit 5 Series,
For Split R32 Indoor unit 5 Series)

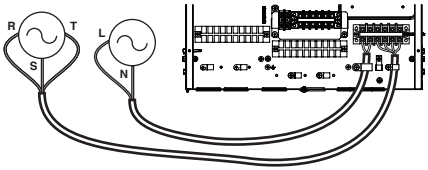


3Ø Backup Heater
(For Split R410A Indoor unit 5 Series)

External power supply
(same dedicated power
supply for the indoor
unit and outdoor unit)



1Ø Backup Heater
(For Hydrosplit)



3Ø Backup Heater
(For Hydrosplit)

PIPING AND WIRING FOR INDOOR UNIT

Procedures about water piping and electric wiring at the indoor unit are described in this chapter. Water piping and water circuit connection, water charging, pipe insulations will be shown for water piping procedures. For wiring, terminal block connection, connecting with the outdoor unit, electric heater wiring will be introduced. Accessories connection, such as sanitary water tank, thermostat, 3way or 2way valves, etc will be dealt in separated chapter.

Water Piping and Water Circuit Connection

⚠ CAUTION

General Considerations

Followings are should be considered before beginning water circuit connection.

- Service space should be secured.
- Water pipes and connections should be cleaned using water.
- Space for installing external water pump should be provided if internal water pump capacity is not enough for installation field.
- Never connect electric power while proceeding water charging.

Definition of terms are as follow :

- Water piping : Installing pipes where water is flowing inside the pipe.
- Water circuit connecting : Making connection between the product and water pipes or between pipes and pipes. Connecting valves or elbows are, for example, in this category.

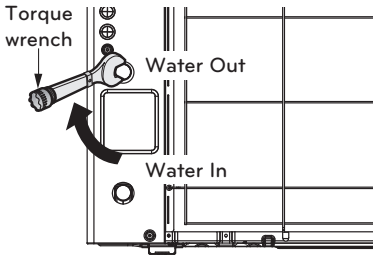
Configuration of water circuit is shown in Chapter 2. All connections should be complied with presented diagram.

While installing water pipes, followings should be considered :

- While inserting or putting water pipes, close the end of the pipe with pipe cap to avoid dust entering.
- When cutting or welding the pipe, always be careful that inner section of the pipe should not be defective. For example, no weldments or no burrs are found inside the pipe.
- Drain piping should be provided in case of water discharge by the operation of the safety valve. This situation can be happened when the internal pressure is over 3.0 bar and water inside the indoor unit will be discharged to drain hose.

While connecting water pipes, followings should be considered.

- Pipe fittings (e.g. L-shape elbow, T-shape tee, diameter reducer, etc) should be tightened strongly to be free from water leakage.
- Connected sections should be leakage-proof treatment by applying teflon tape, rubber bushing, sealant solution, etc.
- Appropriate tools and tooling methods should be applied to prevent mechanical breakage of the connections.
- Operation time of flow control valve(e.g. 3way valve or 2way valve) should be less than 90 seconds.
- Drain hose should be connected with drain piping.
- Maximum allowable Torque at the water piping connection is 50 N·m



(For Hydrosplit)

⚠ WARNING

Installing shut-off valve

- While assembling two shut-off valves pop sound will be heard when valve is open or close by rotating handles. It is normal condition because the sound is due to leakage of charged nitrogen gas inside the valve. The nitrogen gas is applied to secure quality assurance.
  - For Split : LG Supply (Inside 'AWHP Installation Kit')
  - For Hydrosplit : Field Supply
- Before starting water charging, these two shut-off valves should be assembled with water inlet and outlet pipe of the indoor unit.

Water condensation on the floor

While cooling operation, it is very important to keep leaving water temperature higher than 16 °C. Otherwise, dew condensation can be occurred on the floor.

If floor is in humid environment, do not set leaving water temperature below 18 °C.

Water condensation on the radiator

While cooling operation, cold water may not flow to the radiator. If cold water enters to the radiator, dew generation on the surface of the radiator can be occurred.

Drainage treatment

While cooling operation, condensed dew can drop down to the bottom of the indoor unit. In this case, prepare drainage treatment (for example, vessel to contain condensed dew) to avoid water drop.

Water Charging

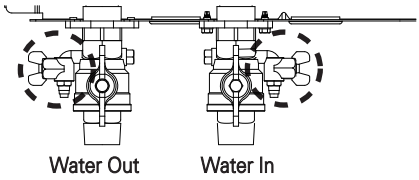
For water charging, please follow below procedures.

Step 1. Open all valves of whole water circuit. Supplied water should be charged not only inside the indoor unit, but also in the under floor water circuit, sanitary water tank circuit, FCU water circuit, and any other water circuits controlled by the product.

Step 2. Connect supply water into drain valve and fill valve located at the side of the shut-off valve.

⚠ CAUTION

No water-leakage permitted at the drain and fill valve. Leakage-proof treatment which is described in previous section should be applied.



Step 3. Start to supply water. While supplying water, following should be kept.

- Pressure of supplying water should be 2.0 bar approximately.
- For supplying water pressure, time to be taken from 0 bar to 2.0 bar should be more than 1 minute. Sudden water supply can yield water drain through safety valve.
- Fully open the cap of air vent to assure air purging. If air is exist inside the water circuit, then performance degrade, noise at the water pipe, mechanical damage at the surface of electric heater coil.
- Open both the air vent in the water pipe and the air vent in the pump.

Step 4. Stop water supplying when the pressure gauge located in front of the control panel indicates 2.0 bar.

Step 5. Close drain valve and fill valve. Then wait for 20~30 seconds to observe water pressure being stabilized.

Step 6. If following conditions are satisfactory, then go to step 7(pipe insulation). Otherwise, go to step 3.

- Pressure gauge indicates 2.0 bar. Note that sometimes pressure in decreased after step 5 due to water charging inside expansion vessel.
- No air purging sound is heard or no water drop are popping out from air vent.

⚠ CAUTION

Keep the air vent of the water pipe open and keep the air vent of the pump closed. Otherwise, the pump may make noise.

Pipe Insulation

Purpose of water pipe insulation is :
- To prevent heat loss to external environment
- To prevent dew generation on the surface of the pipe in cooling operation
- Minimum insulation thickness recommendations ensure correct operation of the product, but local regulations may vary and must be followed.

Water Piping length (m)	Minimum insulation Thickness(mm)
<20	20
20~30	30
30~40	40
40~50	50

* λ = 0.04 W/mk

Water pump Capacity

The water pump is variable type which is capable to change flow rate, so it may be required to change default water pump capacity in case of noise by water flow. In most case, however, it is strongly recommended to set capacity as Maximum.

NOTE

- To secure enough water flow rate, do not set water pump capacity as Minimum. It can lead unexpected flow rate error CH14.

Pressure Drop

NOTE

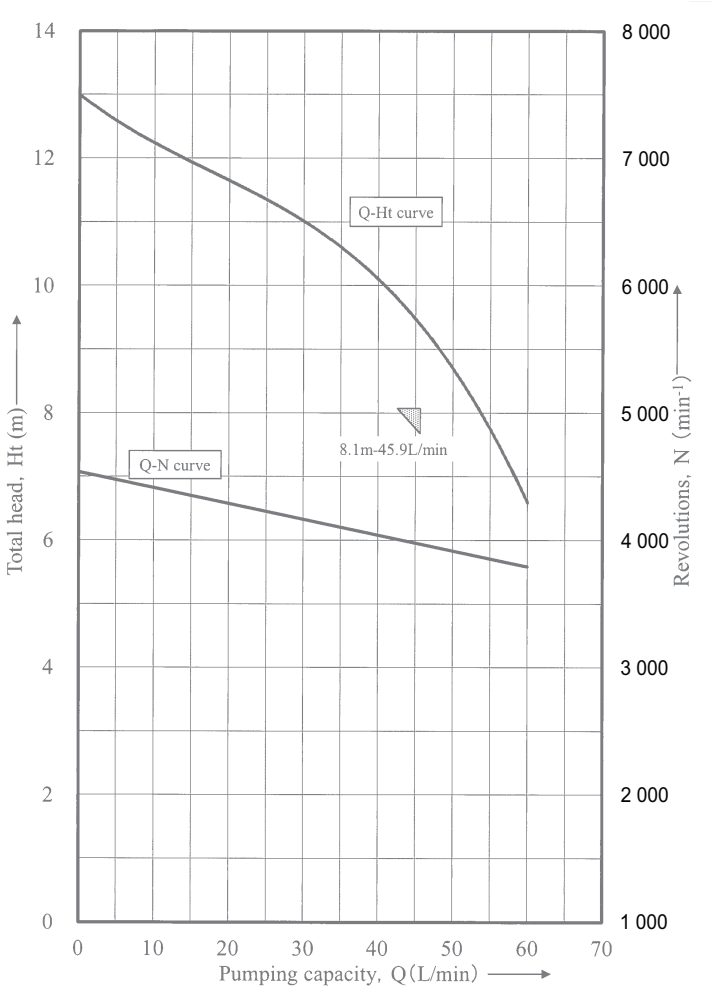
When installing the product, install additional pump in consideration of the pressure loss and pump performance.
If flow-rate is low, overloading of product can occur.

Model	Capacity [kW]	Rated flow-rate [LPM]	Pump Head [m] (at rated flow-rate)	Product pressure drop [m] (Plate heat exchanger)	Serviceable Head [m]
For Split R410A Indoor unit 3 Series	16	46.0	9.5	1.4	8.1
	14	40.25	10.0	1.1	8.9
	12	34.5	10.7	0.8	9.9
	9	25.87	11.3	0.4	10.9
	7	20.12	11.6	0.3	11.3
	5	15.81	11.8	0.2	11.6
For Split R32	9	25.87	6.1	0.4	5.7
	7	20.12	7.3	0.3	7.0
	5	15.81	7.5	0.2	7.3
For Split R410A Indoor unit 5 Series, For Hydrosplit	16	46.0	9	1.4	7.6
	14	40.25	9.3	1.1	8.2
	12	34.5	9.8	0.8	9

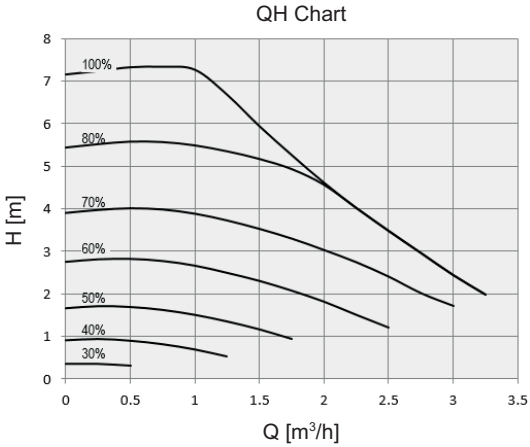
Performance curve

Indoor : Electric Heater 1Ø, Indoor : Electric Heater 3Ø

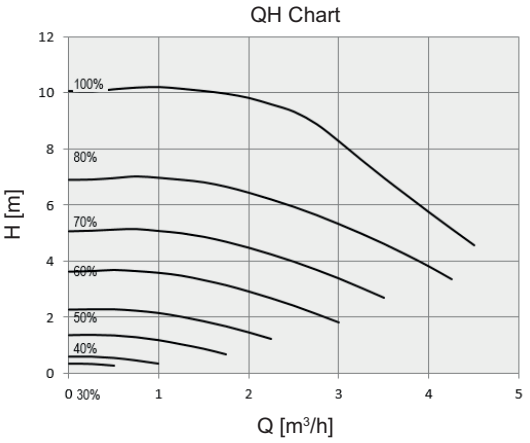
Pump model : PY-122NDDD3 (For Split R410A Indoor unit 3 Series)



MGQ62321902 : UPM3K GEO 20 - 75 CHBL
(5 kW, 7 kW, 9 kW / For Split R32)



MGQ62321901 : UPML GEO 20-105 CHBL
(12 kW, 14 kW, 16 kW / For Split R410A Indoor unit 5 Series, For Hydrosplit)



Performance test based on standard ISO 9906 with pre-pressure 2.0bar and liquid temperature 20 °C.

⚠ WARNING

Selecting a water flowrate outside the curves can cause damage to or malfunction of the unit.

Water Quality

Water quality should be complied with EN 98/83 EC Directives.
Detailed water quality condition can be found in EN 98/83 EC Directives.

⚠ CAUTION

- If the product is installed at existing hydraulic water loop, it is important to clean hydraulic pipes to remove sludge and scale.
- Installing sludge strainer in the water loop is very important to prevent performance degrade.
- Chemical treatment to prevent rust should be performed by installer.
- It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from the heating piping, it is advised to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.

Frost protection by antifreeze

In areas of the country where entering water temperatures drop below 0 °C, the water pipe must be protected by using an approved antifreeze solution. Consult your AWHP unit supplier for locally approved solutions in your area. Calculate the approximate volume of water in the system. (Except the AWHP unit.) And add six liters to this total volume to allow for the water contained in AWHP unit.

Antifreeze type	Antifreeze mixing ratio					
	0 °C	-5 °C	-10 °C	-15 °C	-20 °C	-25 °C
Ethylene glycol	0 %	12 %	20 %	30 %	-	-
Propylene glycol	0 %	17 %	25 %	33 %	-	-
Methanol	0 %	6 %	12 %	16 %	24 %	30 %

If you use frost protection function, change DIP switch setting and input the temperature condition in Installation mode of remote controller. Refer to 'CONFIGURATION > DIP Switch Setting > DIP Switch Information > Option Switch 3' and 'INSTALLER SETTING > Antifreezing Temperature'.

⚠ CAUTION

- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can be occurred.
- If one of antifreezes is used, corrosion can be occurred. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to keep same concentration.
- When the antifreeze is used (for installation or operation), take care to ensure that antifreeze must not be touched.
- Ensure to respect all laws and norms of your country about Anti-freeze usage.

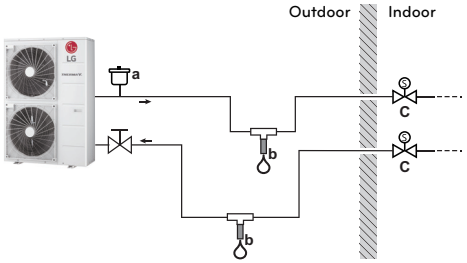
Frost protection by antifreeze valve (For Hydrosplit)

About antifreeze valve

This is a valve to prevent freeze in winter. When no antifreeze is added to the water, you can use antifreeze valves at all lowest points of the field piping to drain the water from the system before it can freeze

To install antifreeze valve

To protect the field piping against freezing, install the following parts:

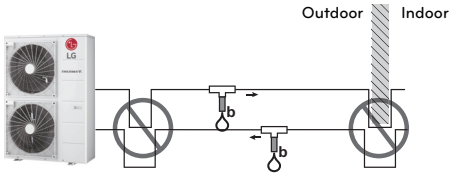


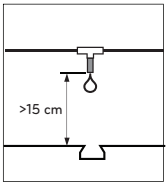
a Automatic air intake
b Antifreeze valve (Optional – field supply)
c Normally closed valves (recommended – field supply)

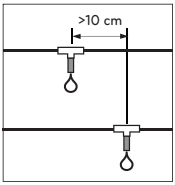
Part	Description
a	An automatic air intake (for air supply) should be installed at the highest point. For example, an automatic air purge.
b	Protection for the field piping. The antifreeze valve must be installed: • Vertically to allow water to flow out properly and free from obstructions. • At all lowest points of the field piping. • In the coldest part and away from heat sources.
c	Isolation of water inside the house when there is a power interruption. Normally closed valves (located indoors near the piping entry/exit points) can prevent that all water from indoor piping is drained when the antifreeze valve open. • **When there is a power interruption:** The normally closed valves close and isolate the water inside the house. If the antifreeze valve open, only the water outside the house is drained. • **In other circumstances** (example: when there is a pump failure): The normally closed valves remain open. If the antifreeze valve open, the water from inside the house is also drained.

NOTE

- Do not make any trap connections. If the shape of the connection pipe has the potential to create a trap effect, part of the pipe will not be able to drain and frost protection will no longer be guaranteed.
- Leave at least 15 cm clearance from the ground to prevent ice from blocking the water exit.
- Keep a distance of at least 10 cm between the antifreeze valves.
- The valve must be free of insulation for the system to work properly.
- When antifreeze valves are installed, do NOT select a minimum cooling setpoint lower than 7 °C. If lower, antifreeze valves can open during cooling operation.
- When installed outdoors, the antifreeze valve must be protected from rain, snow and direct sunlight.



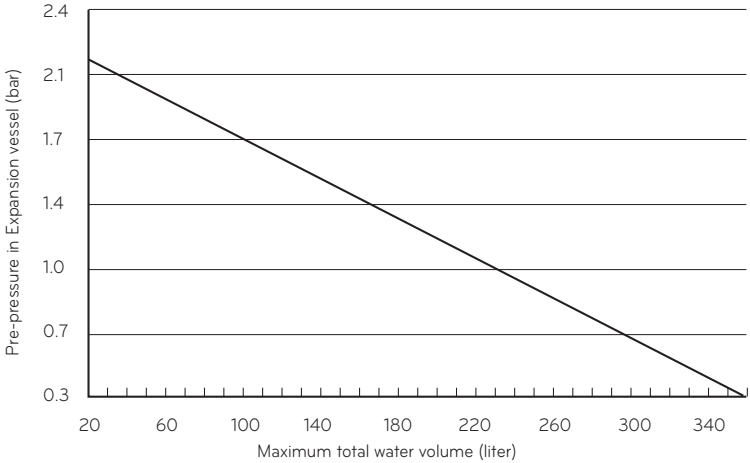




Water Volume and Expansion Vessel Pressure

Inside expansion vessel is included which is 8 liter capacity with 1 bar pre-pressure. That means, according to the volume-pressure graph, total water volume of 230 liter is supported as default. If total water volume is changed because of installation condition, the pre-pressure should be adjusted to secure proper operation.

- Minimum total water volume is 20 liter.
- Pre-pressure is adjusted by the total water volume. If the indoor is located at the highest position of the water circuit, adjustment is not required.
- To adjust pre-pressure, use nitrogen gas by certificated installer.



Adjusting pre-pressure of expansion vessel is as following :

Step 1. Refer "Volume-Height" table.
If installation scene is belong to Case A, go to Step 2.
Otherwise, if it is Case B, do nothing. (pre-pressure adjustment is not required.)
Otherwise, if it is Case C, go to Step 3.

Step 2. Adjust pre-pressure by following equation.
Pre-pressure [bar] = (0.1 x H + 0.3) [bar]
where H : difference between unit and the highest water pipe
0.3 : minimum water pressure to secure product operation

Step 3. Volume of expansion vessel is less than installation scene.
Please install additional expansion vessel at the external water circuit.

Volume-Height Table

	V < 230 liter	V ≥ 230 liter
H < 7 m	Case B	Case A
H ≥ 7 m	Case A	Case C

H : difference between unit and the highest water pipe
V : total water volume of installation scene

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 Kit	To operate with DHW tank	PHLTA : 1Ø PHLTC : 3Ø
Remote Air Sensor	To control by air temperature	PQRSTA0
Dry Contact	To receive on & off external signal	PDRYCB000
	Dry Contact For Thermostat	PDRYCB320
Solar Thermal Kit	To operate with solar heating system	(For Split) PHLLA (Limit temperature : 96 °C)
DHW Tank	To generate and store hot water	OSHW-200F : 200 L, Single Heating Coil, 1Ø 230 V 50 Hz 2.4 kW Booster heater OSHW-300F : 300 L, Single Heating Coil, 1Ø 230 V 50 Hz 2.4 kW Booster heater OSHW-500F : 500 L, Single Heating Coil, 1Ø 230 V 50 Hz 2.4 kW Booster heater OSHW-300F : 300 L, Double Heating Coil, 1Ø 230 V 50 Hz 2.4 kW Booster heater
Thermistor for DHW Tank	To control hot water temperature of DHW tank	PHRSTA0
Drain Pan	To prevent drain water drop	PHDPB
Meter Interface	To measure production / consumption power	PENKTH000
Central Controller	Multiple installed products into one central control	AC EZ Touch (PACEZA000) AC Smart IV (PACS4B000) AC Smart 5 (PACS5A000) ACP 5 (PACP5A000) AC Manager 5 (PACM5A000)

Item	Purpose	Model
PI485	To use Central Controller	PMNFP14A1
Wi-Fi Modem	To enable remote system operation from smartphone	PWFMDD200
Extension cable for Wi-Fi Modem	To connect with Wi-Fi modem to the USB cable	PWYREW000
Thermistor for 2nd Circuit or E/Heater	To interlock with 2nd circuit operation and control temperature of main zone or To interlock with 3rd party E/Heater and control temperature of water out3rd party E/Heater.	PRSTAT5K10
Extension wire	To connect remote controller with Indoor PCB for communication	PZCWRC1
Cover Plate	To relocate remote controller from indoor unit	PDC-HK10
Backup heater	To supplement in sufficient capacity	For Hydrosplit 1-Pipe HA061B E1 : 1Ø HA063B E1 : 3Ø For Hydrosplit 2-Pipe HA061C E1 : 1Ø HA063C E1 : 3Ø
ESS	To control the operation mode according to the energy storage state	(For Split Indoor unit 5 Series, For Hydrosplit) HOME 8 (PCS) : D008KE1N211 HOME10 (PCS) : D010KE1N211 HB7H (Battery) : BLGRESU7H HB10H (Battery) : BLGRESU10H
RS3 remote controller	To control unit with 2 remote controllers	PREMTW101
2-Remo Control Wire	The wire for 2 remo control	PZCWRC2

⚠ CAUTION

- Install the drain pan when cooling.
- If not installed, water may form.
- Please refer to separate installation manual when installing drain pan.

Accessories supported by 3rd party Companies

Item	Purpose	Specification
Solar Heating System	To generate auxiliary heating energy for water tank	(For Split Indoor unit 5 Series, For Hydrosplit) • Solar collector • Solar pump • 3way valve(B) • Solar Thermal Sensor : PT1000
Thermostat	To control by air temperature	Heating-Only type (230 V AC) Cooling/Heating type (230 V AC with Mode selection switch)
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	
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 block underfloor heating coil from cooling water	2 wire,NO(Normal Open) or NC(Normal Closed) type, 230 V AC
External Pump	To control the water flow at the rear of the buffer tank	
Smart Grid	To control operation mode depending on input signal from provider	
3rd Party ESS	To control the operation mode according to the energy storage state	(For Split Indoor unit 5 Series, For Hydrosplit)
3rd party Backup heater	To supplement in sufficient capacity	(For Hydrosplit)
Antifreeze valve	To protect the pipes against freezing	

Before Installation

⚠ WARNING

Followings should be kept before installation
- Main power must be turned off during installing 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.

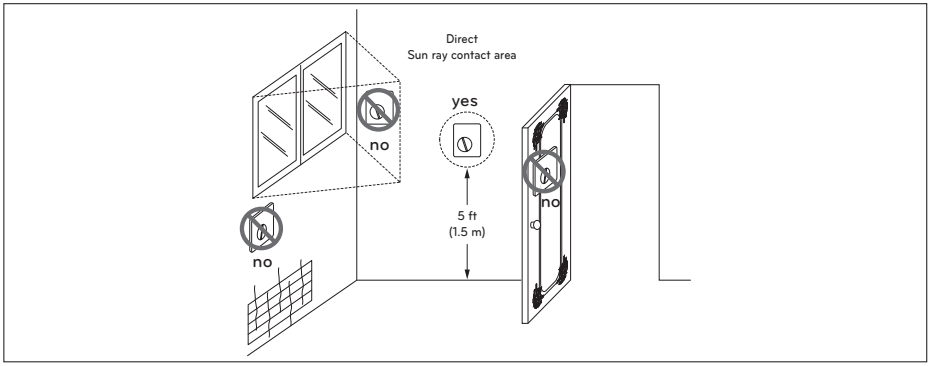
Installation condition

⚠ 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)



Thermostat

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
		Heating / Cooling / DHW Heating (5)	Yes
Electrical (2)	230 V~	Heating Only (3)	Yes
		Heating / Cooling (4)	Yes
		Heating / Cooling / DHW Heating (5)	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) Thermostat generates both "Heating ON or Heating OFF" and "Cooling ON or Cooling OFF" signal according to user"s heating and cooling target temperature.

(5) Thermostat generates "Heating ON or Heating OFF", "Cooling ON or Cooling OFF", "DHW Heating ON or DHW Heating OFF" signal according to user's heating, cooling and DHW heating target temperature. (For Split Indoor unit 5 Series, For Hydrosplit)

⚠ 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

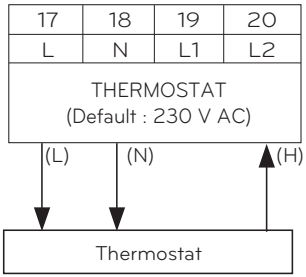
Follow below procedures Step 1 ~ Step 5.

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.



⚠ 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.

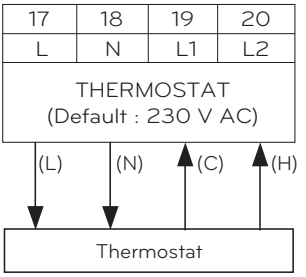
Wire (L) and (N) should be used only for operation electric type thermostat.
Never connect external electric loads such as valves, fan coil units, etc. If connected, Main PCB (Heater) can be seriously damaged.

(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

How to wire Heating / Cooling / DHW Heating thermostat (For Split Indoor unit 5 Series, For Hydrosplit)

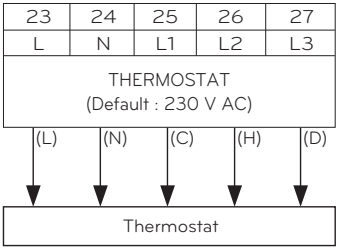
Follow below procedures Step 1 ~ Step 3.

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

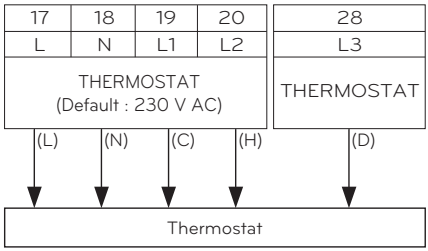
Step 2. Identify the power specification of the thermostat. If it is 220-240 V~, go to Step 3.

Step 3. Find terminal block and connect wire as below.

For Split Indoor unit 5 Series
For Hydrosplit 2-Pipe



For Hydrosplit 1-Pipe



⚠ 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

(D) : DHW 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.
  - In case of Heating / Cooling / DHW Heating thermostat, select 'Heat&Cool / DHW' as the Thermostat Control Type in the remote controller installer settings.

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 circuit 2.

- For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series

[Install Guide 2nd Circuit Heating]

Circuit 2 / Circuit 1	Floor (35°C)	Convector (FCU, 45 °C)	Radiator (45 °C)	Radiator (55 °C)
Floor (35 °C)	O	X	X	X
Convector (FCU, 45 °C)	O	O	O	X
Radiator (45 °C)	O	O	O	X
Radiator (55 °C)	O	O	O	O

[Install Guide 2nd Circuit Cooling]

Circuit 2 / Circuit 1	Floor (18 °C)	Convector (FCU, 5 °C)
Floor (18 °C)	O	X
Convector (FCU, 5 °C)	O	O

- For Split Indoor unit 5 Series, For Hydrosplit

[Install Guide 2nd Circuit Heating]

Circuit 2 / Circuit 1	Floor (35°C)	Convector (FCU, 45 °C)	Radiator (45 °C)	Radiator (55 °C)
Floor (35 °C)	O	O	O	O
Convector (FCU, 45 °C)	O	O	O	O
Radiator (45 °C)	O	O	O	O
Radiator (55 °C)	O	O	O	O

[Install Guide 2nd Circuit Cooling]

Circuit 2 / Circuit 1	Floor (18 °C)	Convector (FCU, 5 °C)
Floor (18 °C)	O	O
Convector (FCU, 5 °C)	O	O

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

NOTE

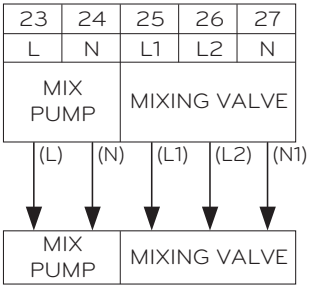
Circuit 1 = Direct circuit : Zone where the water temperature is lowest when heating
Circuit 2 = Mixing circuit : The other zone

How to Wire Mix Pump, Mixing Valve and Thermistor for 2nd Circuit (For Split R32 4 Series, For Split R410A 3 Series)

Follow below procedures Step 1 ~ Step 3.

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

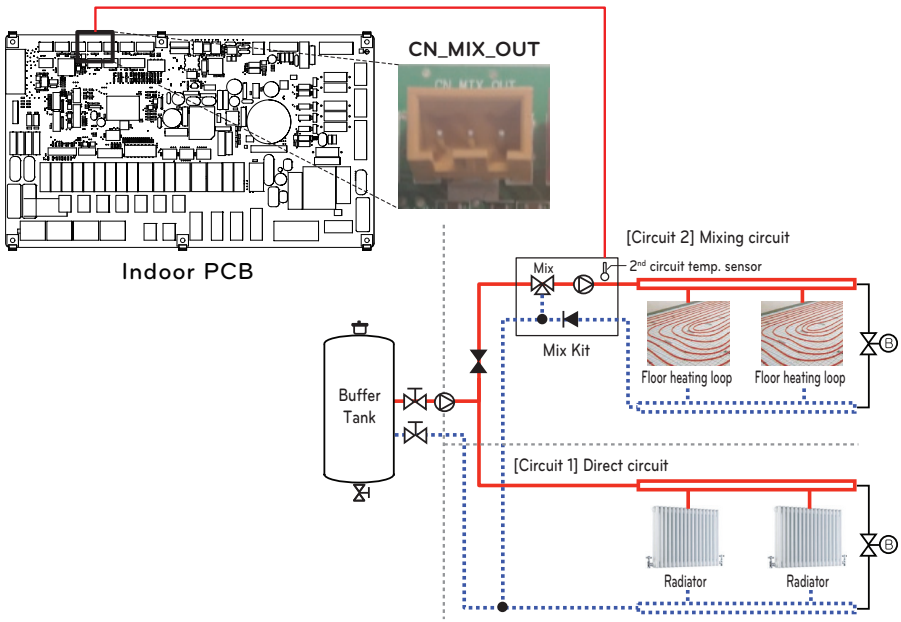
(L1) : Live signal (for Normal* Closed type) from PCB to mixing valve

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

(N1) : Neutral signal from PCB to mixing valve

*Closed = NOT Mixed

Step3. Insert the temperature sensor to 'CN_MIX_OUT' (Brown) of the main PCB as shown below. The sensor should be mounted correctly to discharge pipe of mix 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

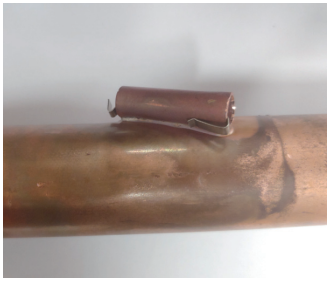
Follow below procedures step 1 ~ step 4.

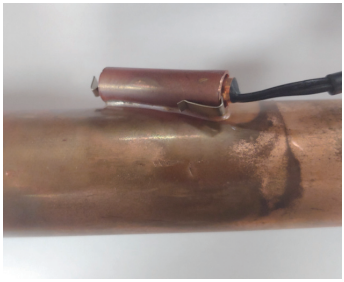
Step 1. Install sensor connector to discharge pipe of mix pump.
(Welding must be performed to connect the sensor connector to the pipe)

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.





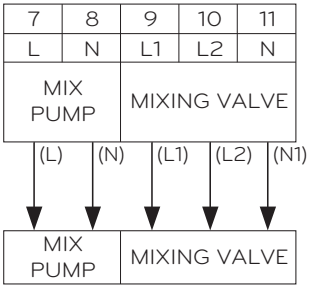
How to Wire Mix Pump, Mixing Valve and Thermistor for 2nd Circuit (For Split Indoor unit 5 Series, For Hydrosplit)

Follow below procedures Step 1 ~ Step 3.

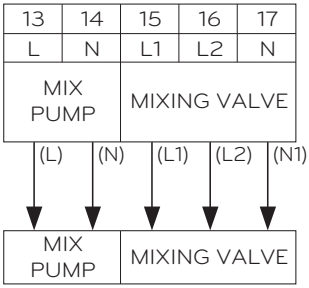
Step 1. Uncover front cover of the unit.

Step 2. Find terminal block and connect wire as below

For Split Indoor unit 5 Series
For Hydrosplit 2-Pipe



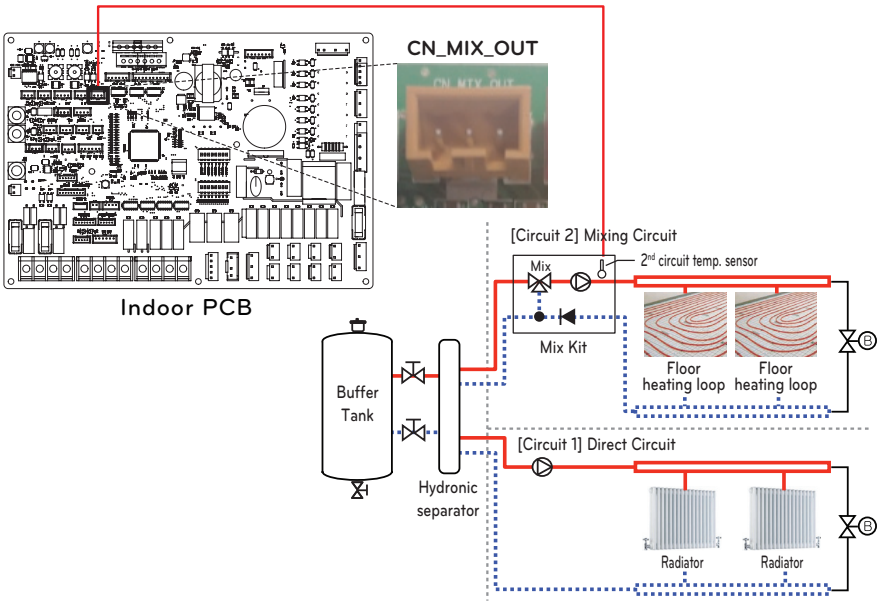
For Hydrosplit 1-Pipe



(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

Step3. 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

3rd party Backup heater (For Hydrosplit)

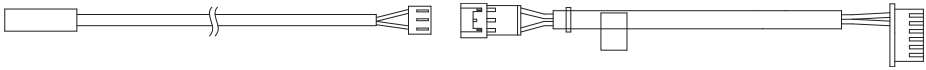
The product can be used by connecting an Auxiliary Backup heater. You can control the Backup heater automatically and manually by comparing the water out temperature of Backup heater and the set temperature.

How to install 3rd party Backup heater

Follow below procedures Step 1 ~ 4.

Step 1. Find the middle link harness and the temperature sensor.

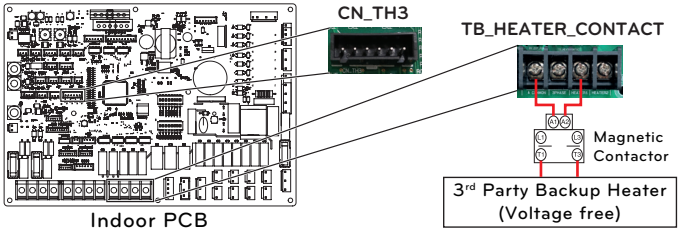
Step 2. Insert connector(Brown) of the temperature sensor to connector(White) of the middle link harness as shown below.

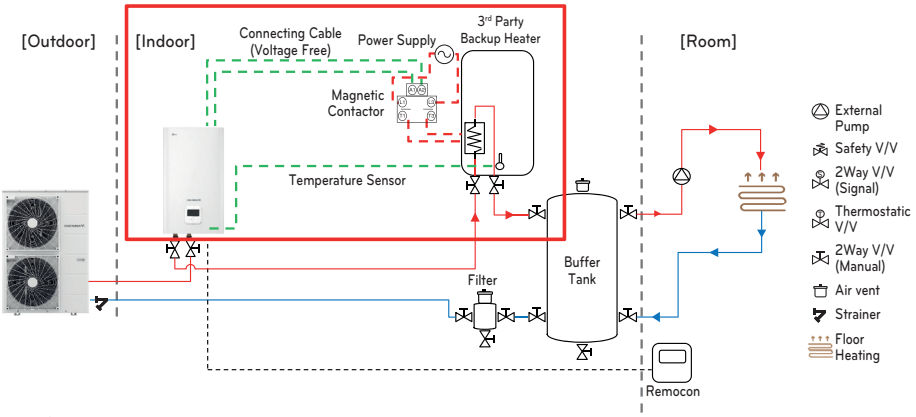


Temperature sensor　　Middle Link Harness

Step 3. Insert connector(Black) of middle link harness to 'CN_TH3' in the Main PCB connector(Black) as shown below. The sensor should be mounted correctly to outlet pipe of backup heater as shown below.

Step 4. Connect Power cable to the terminal block 'TB_HEATER_CONTACT' using the Magnetic Contactor.





NOTE

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

✻ Water In / Water Out installation scene may vary depending on the model.

[Thermistor for 3rd party Backup heater]

Sensor

Sensor Holder

Sensor Connector

Middle link harness

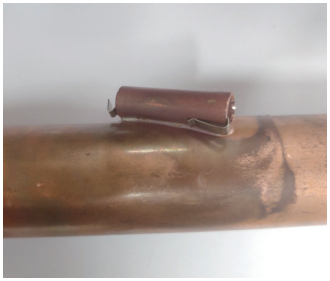
Follow below procedures Step 1 ~ 4.

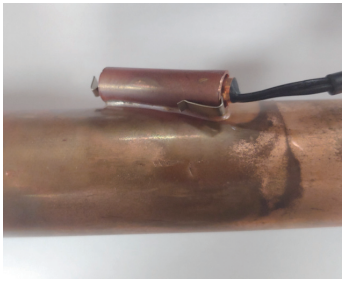
Step 1. Install sensor connector to outlet pipe of backup heater.
(Welding must be performed to connect the sensor connector to the pipe.)

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_TH3) 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. 3rd party boiler can be controlled by manually via remote controller or automatically itself by means of comparing the outside air temperature and the pre-set temperature.

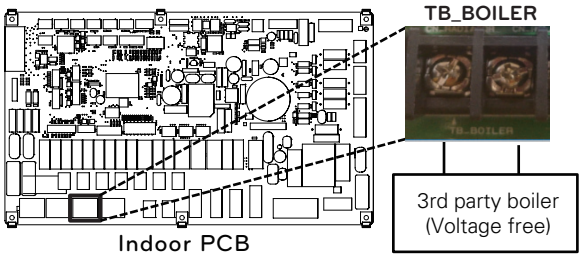
How to wire 3rd party boiler

Follow below procedures step 1 ~ step 3.

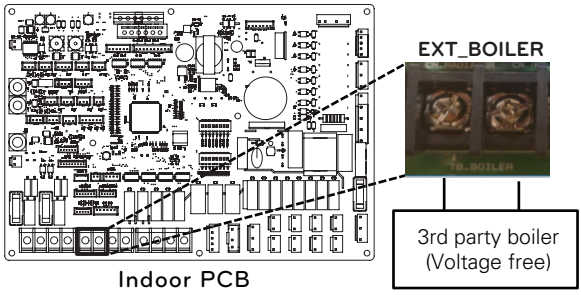
Step 1. Check if the power of the unit is turned off.

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

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



(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



(For Split Indoor unit 5 Series, For Hydrosplit)

3rd Party Controller

The product can also be linked to 3rd party controller. 3rd party boiler can be controlled by manually via RS3 remote controller or automatically itself by means of comparing the outside air temperature and the pre-set temperature.

How to wire 3rd party controller

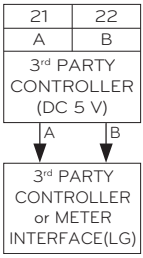
Follow below procedures step 1 ~ step 4.

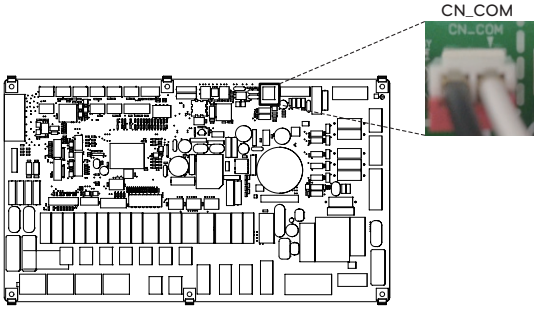
Step 1. Check if the power of the unit is turned off.

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).

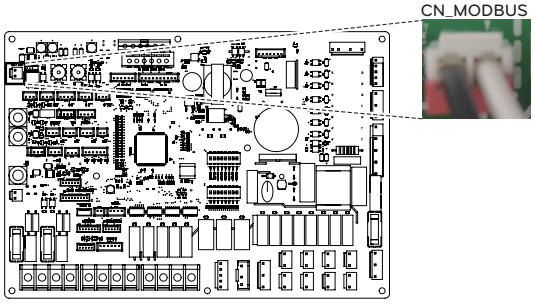
Step 4. Connect the 3rd party controller to terminal block 4(21/22) completely. (including Meter interface module)





Indoor PCB

(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



Indoor PCB

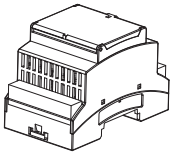
(For Split Indoor unit 5 Series, For Hydrosplit)

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

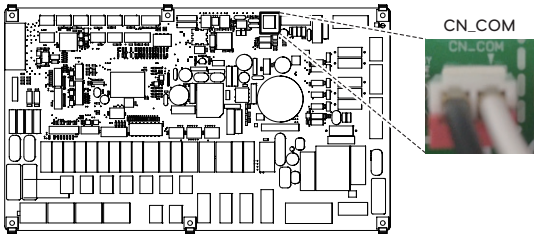
Follow below procedures step 1 ~ step 4.

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.

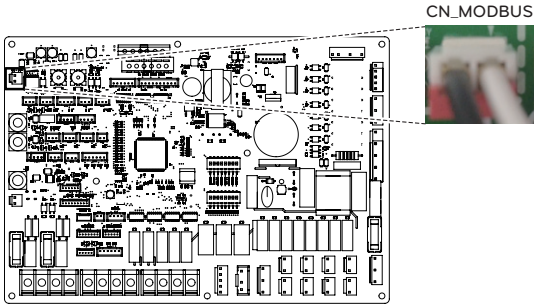
Step 3. Check if the harness(White) is inserted fully to the indoor unit PCB (CN_COM).

Step 4. Connect the external pump to terminal block 4(21/22).



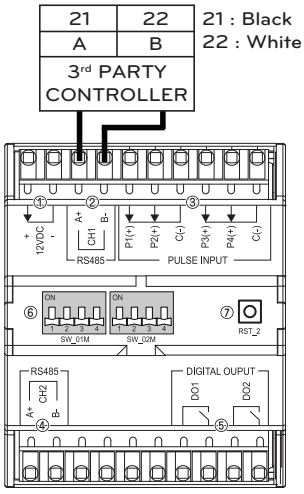
Indoor PCB

(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



Indoor PCB

(For Split Indoor unit 5 Series, For Hydrosplit)



Meter interface

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 Install Central Controller

To use central controller, you need to establish an environment for mutual communication between central controller and the THERMA V and register the corresponding devices through the functions of central controller. To use central controller, it shall be installed in the following order.

Step 1. Installation environment inspection and device address setting
Before installing central controller, check the network for any interfacing devices and assign non overlapping addresses to the connected devices.

Step 2. PI485 setting
Install PI485 and set the DIP switch accordingly.

Step 3. Connections
Connect PI485 and central controller through RS-485 cable.

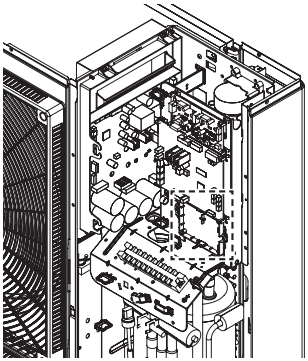
Step 4. Access and Device Registration
Log in to central controller and register device with address set.
Consult a qualified engineer/ technician for the installation of central controller. If you have any installation queries, contact the LG service center or LG Electronics.

How to Installation PI485

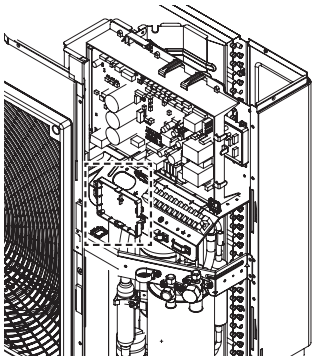
Fix the PI485 PCB as shown in below images.

For detailed installation method refer to PI485 Installation Manual

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



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



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

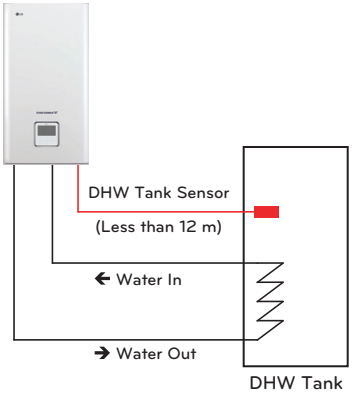
DHW Tank

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 tank following considerations :

- DHW tank should be located at the flat place.
- Water quality should be complied with EN 98/83 EC directives.
- As this water tank is sanitary 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 tank after installation. It ensures generating clean hot water.
- Near the DHW 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.



❉ Water In / Water Out installation scene may vary depending on the model.

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.

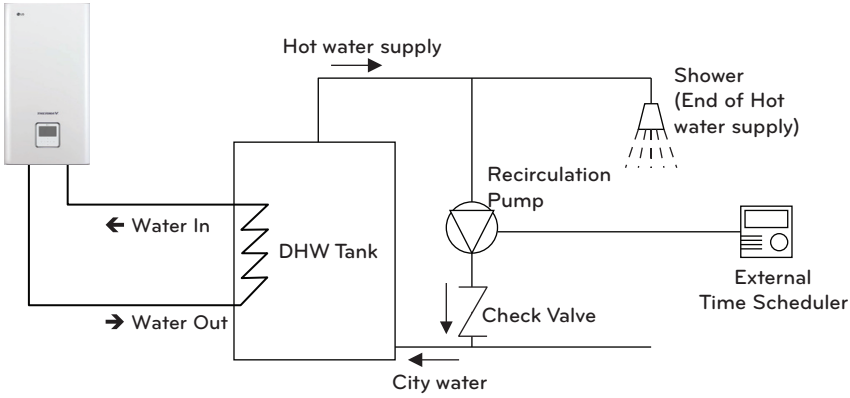
(3) : 'Flow B' means water flow from the unit to DHW tank.

⚠ 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 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 demand.



❊ Water In / Water Out installation scene may vary depending on the model.

How to Wire Booster 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

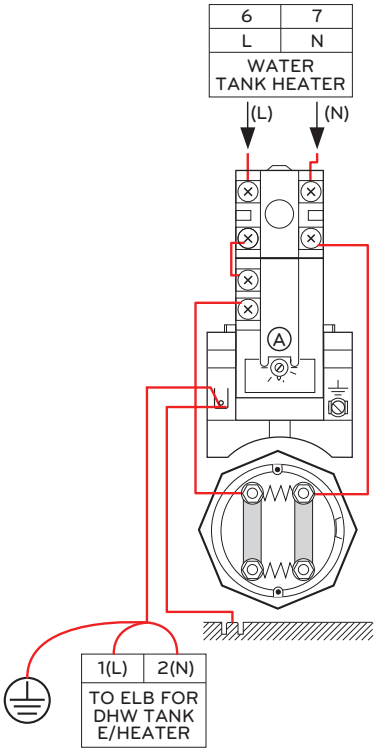
Wire specification

- Cross-sectional area of the wire should be 6 mm².

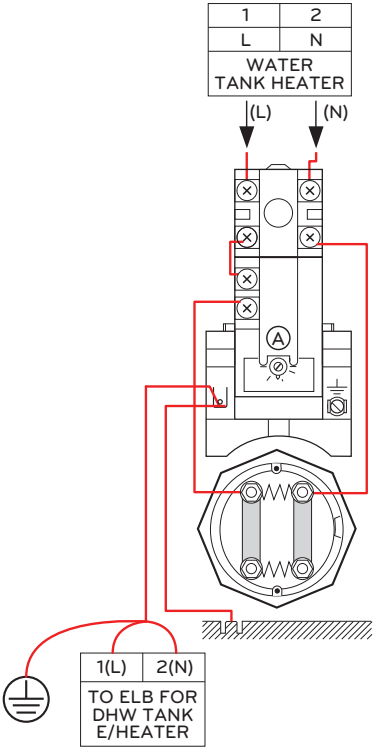
Adjusting thermostat temperature

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

For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series,
For Hydrosplit 1-Pipe



For Split Indoor unit 5 Series
For Hydrosplit 2-Pipe

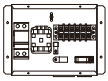


DHW Tank Kit

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.

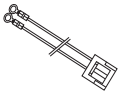
How to install DHW tank kit

[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.

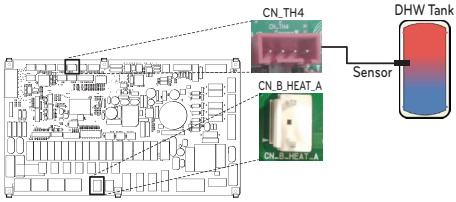
Step 1. Uncover DHW tank kit and locate it on the wall.

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

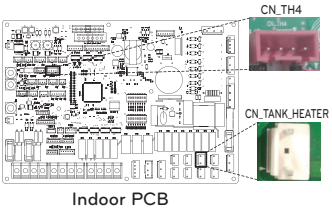
Step 3. Insert DHW tank sensor to 'CN_TH4' (Red) of the Main PCB refer as below.

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. 1.



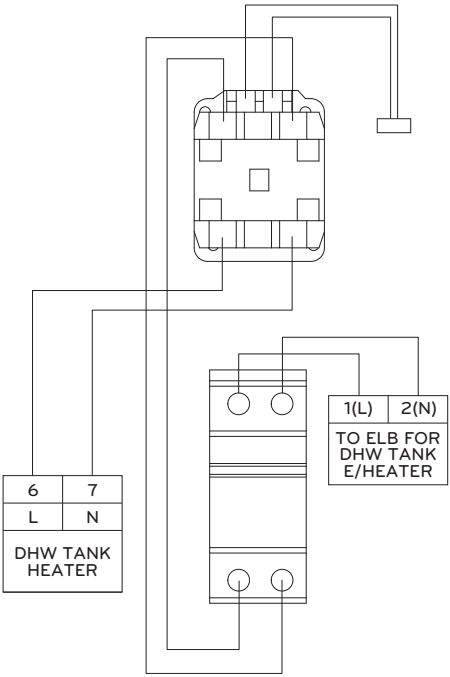
(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



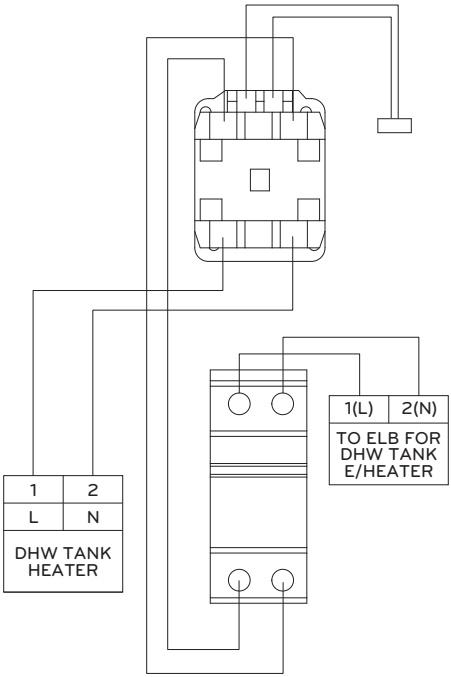
(For Split Indoor unit 5 Series, For Hydrosplit)

Fig. 1

For Split R410A Indoor unit 3 Series,
For Split R32 Indoor unit 4 Series,
For Hydrosplit 1-Pipe

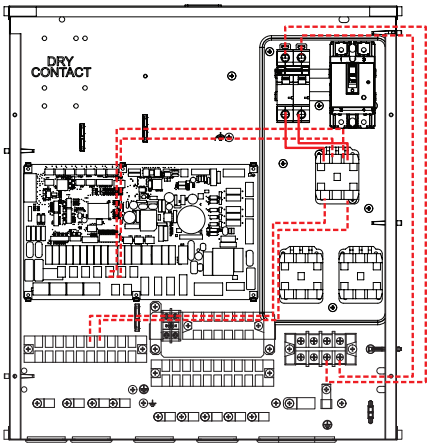


For Split Indoor unit 5 Series
For Hydrosplit 2-Pipe

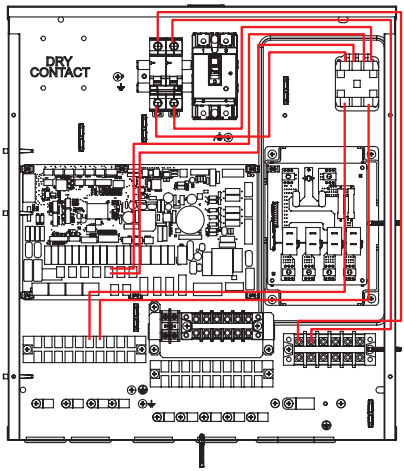


Check Polarity
(For Split R410A Indoor unit 3 Series, For Split R32 Indoor unit 4 Series)

Booster heater for 1Ø model

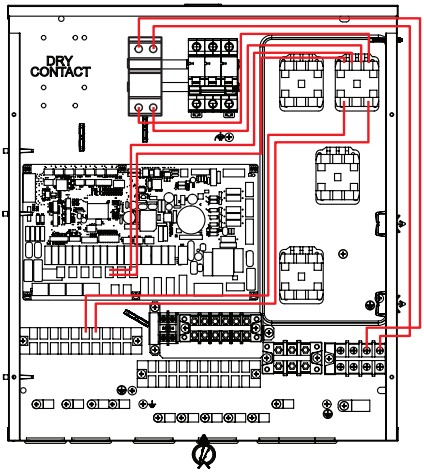


With magnet switch
(Production date : Until Sep. 30, 2019)



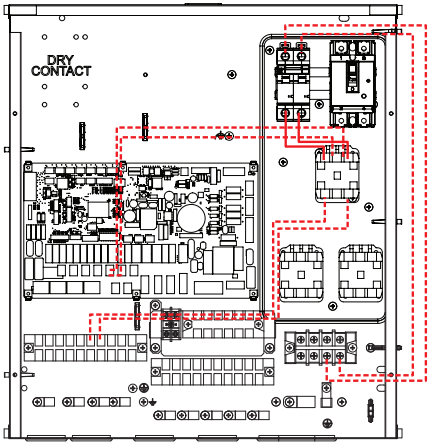
With heater PCB
(Production date : From Oct. 1, 2019)

Booster heater for 3Ø model

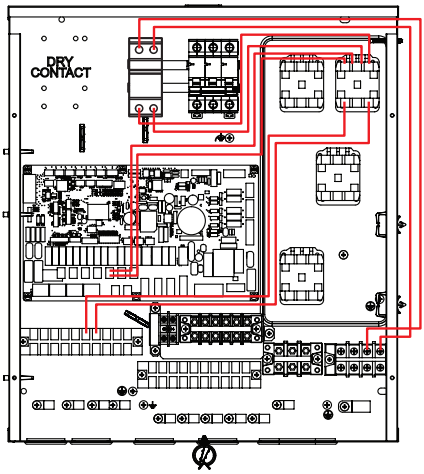


Check Polarity (For Split Indoor unit 5 Series)

Booster heater for 1Ø model



Booster heater for 3Ø model



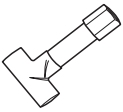
Solar Thermal Kit

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 install solar thermal kit accessory(PHLLA) provided by LG.

How to Install Solar Thermal Kit

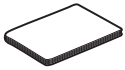
[Parts of Solar Thermal Kit]

Sensor Holder



Tube Connector

Solar Thermal Sensor



Installation Manual

Follow below procedures step 1 ~ step 4.

Step 1. Install tube connector on the pipe of solar thermal system and insert the sensor holder and solar thermal sensor in order. A reducer or expander could be required to fit with the piping diameter.

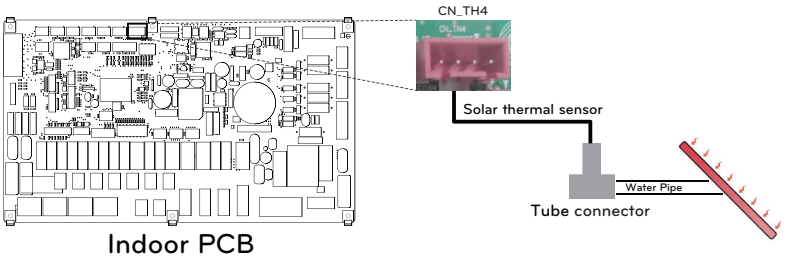
Step 2. Check if the power of the unit is turned off.

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

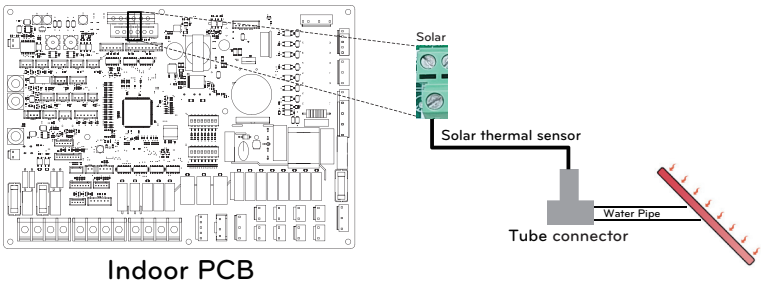
Step 4. Insert harness into PCB fully and fix the thermal sensor into tube connector as shown below.

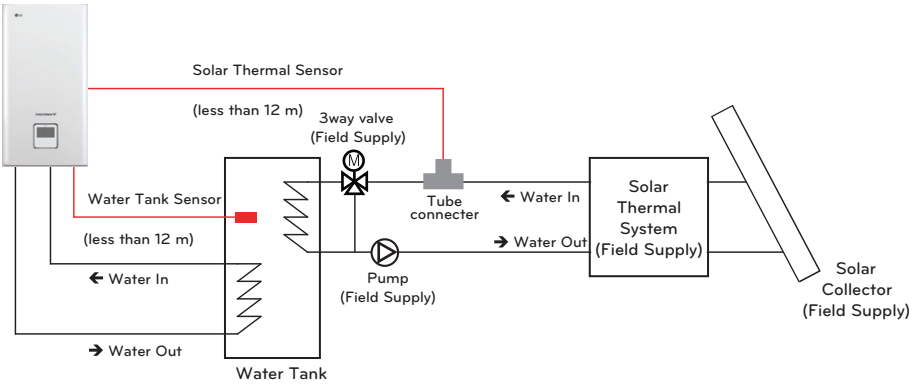
❋ If the DHW tank sensor is connected, disconnect the sensor from PCB first.
Solar Thermal Sensor : PT1000 (Field Supply)

For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series



For Split Indoor unit 5 Series, For Hydrosplit





❉ Water In / Water Out installation scene may vary depending on the model.

- insert sensor until the cable tie as shown below.

CAUTION

Sensor mounting

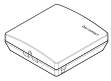
Insert sensor into sensor socket and bolt it tightly.

Dry Contact

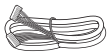
Dry Contact is a solution for automatic control of HVAC system at the owner's best. In simple words, it's a switch which can be used to turn the unit On/Off after getting the signal from external sources.

How to install dry contact

[Parts of Dry contact]



Dry Contact body



Cable(for connecting with IDU)

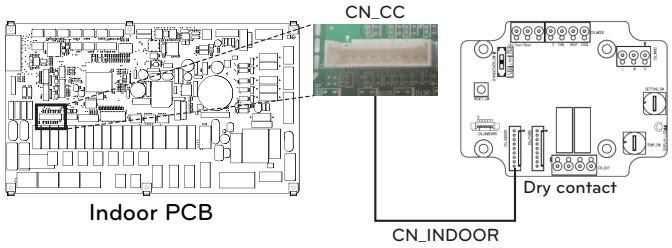
Follow below procedures step 1 ~ step 4.

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

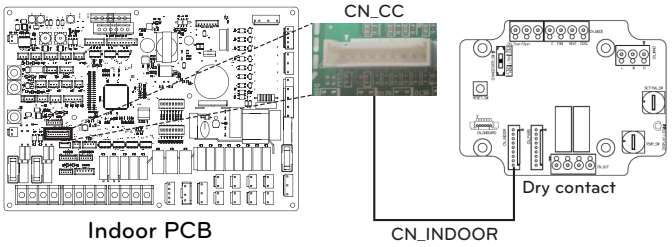
Step 2. Disassemble front panels and distinguish terminal block in Indoor PCB.

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.



(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



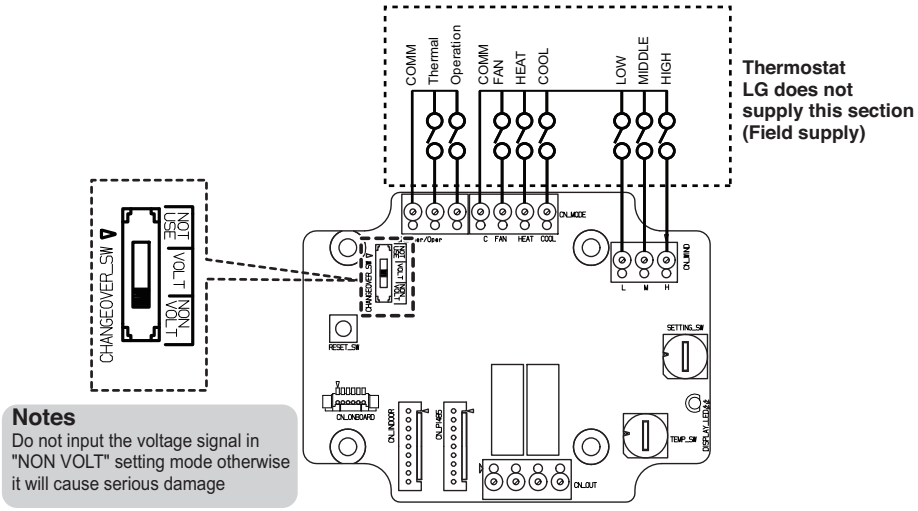
(For Split Indoor unit 5 Series, For Hydrosplit)

NOTE

- For more information about installing Dry Contact, Please refer installation manual provided with Dry Contact.
- For system set-up, please read chapter 8 (Accessory Installation) and chapter 9 (DIP Switch setting).

[Setting of Contact Signal Input]

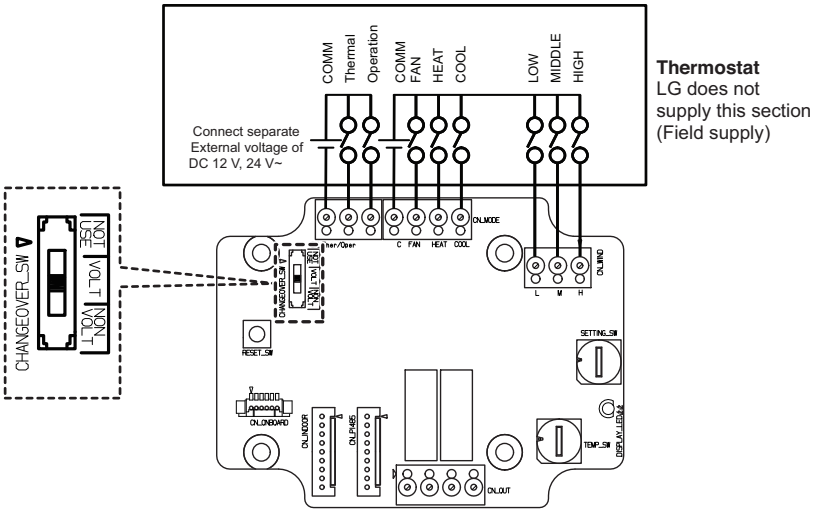
• For input contact closure only(No power input)



Notes

Do not input the voltage signal in "NON VOLT" setting mode otherwise it will cause serious damage

• For input contact voltage : DC 12 V, 24 V~



External Controller - Setting up programmable digital input operation

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

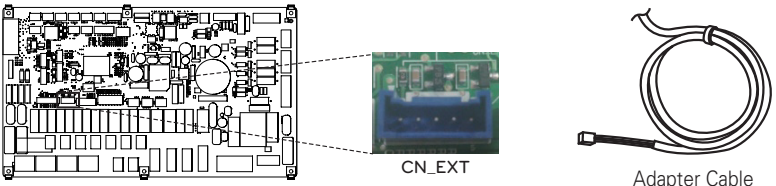
Follow below procedures step 1 ~ step 4.

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

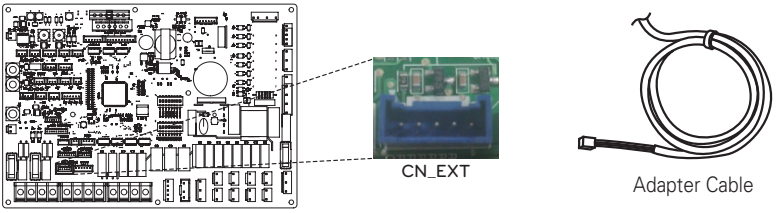
Step 2. Disassemble front panels and distinguish control box(Indoor) of the unit

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

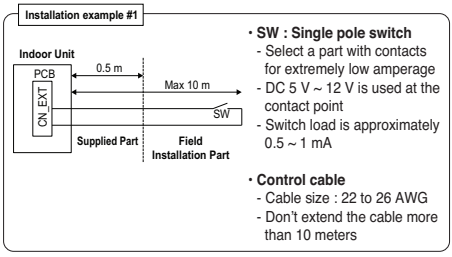
Step 4. Connect the cable and field installation part.

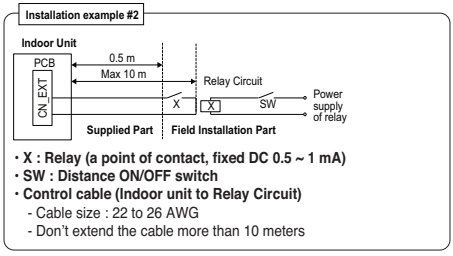


(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



(For Split Indoor unit 5 Series, For Hydrosplit)





Remote Temperature Sensor

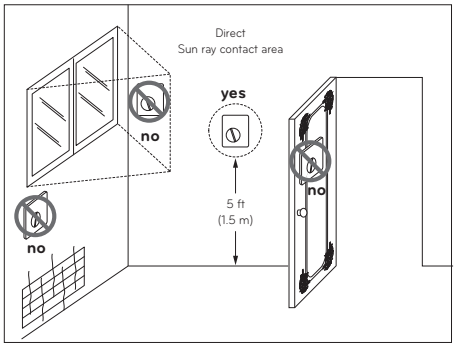
Remote temperature sensor can be installed any place a user wants to detect the temperature.

- The function is not available for some products.

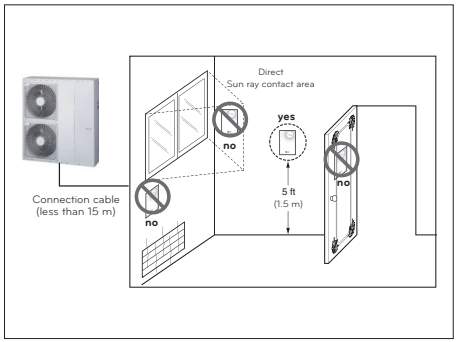
Installation condition

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]

Cable

Screw(to fix remote sensor)

Installation Manual

Follow below procedures step 1 ~ step 6.

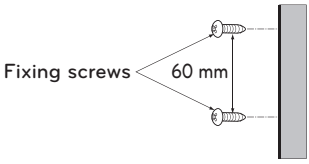
Step 1. Decide where the remote temperature sensor is Installed. Then, Determine the location and height of the fixing screws in fig. 1 (Interval between the screws : 60 mm)

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

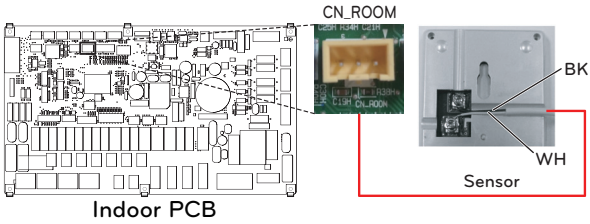
Step 3. Disassemble front panels and distinguish control box(Indoor) of the unit.

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.

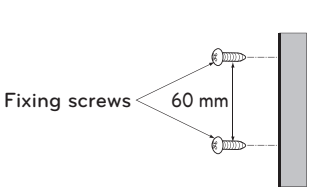


[fig. 1]

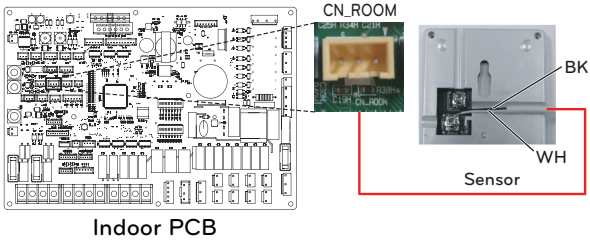


[fig. 2]

(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



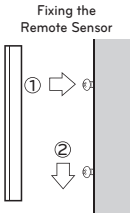
[fig. 1]



[fig. 2]

(For Split Indoor unit 5 Series, For Hydrosplit)

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 (Accessory Installation) and chapter 9 (DIP Switch setting).

Solar pump

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

How to wire solar pump

Follow below procedures step 1 ~ step 4.

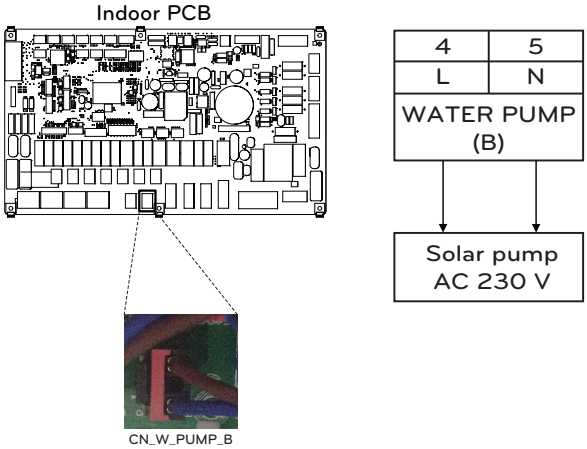
Step 1. Check if the power of the unit is turned off.

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

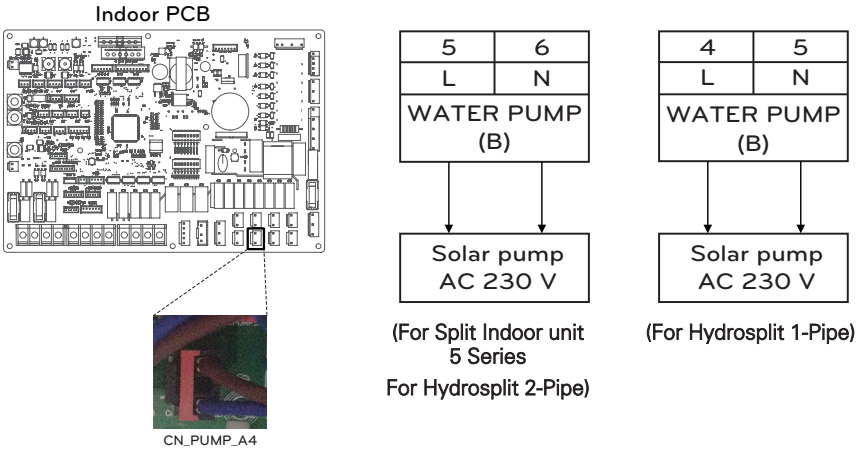
Step 3. Check if the harness(Black) is inserted fully to the indoor unit PCB (CN_W_PUMP_B).

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

✻ It is possible to un-use solar pump depending on instal environment.



(For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)



(For Split Indoor unit 5 Series
For Hydrosplit 2-Pipe)

(For Hydrosplit 1-Pipe)

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.

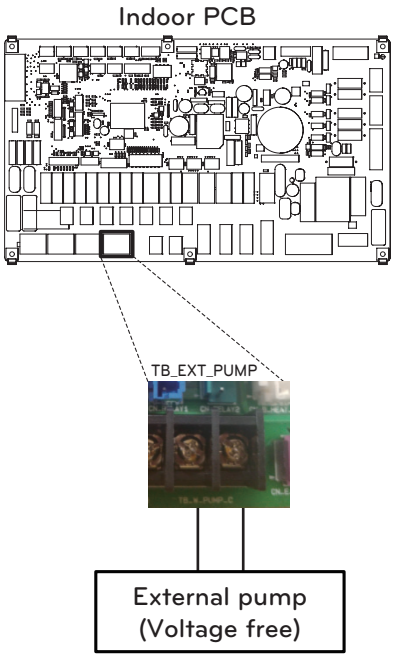
How to wire external pump

Follow below procedures step 1 ~ step 3.

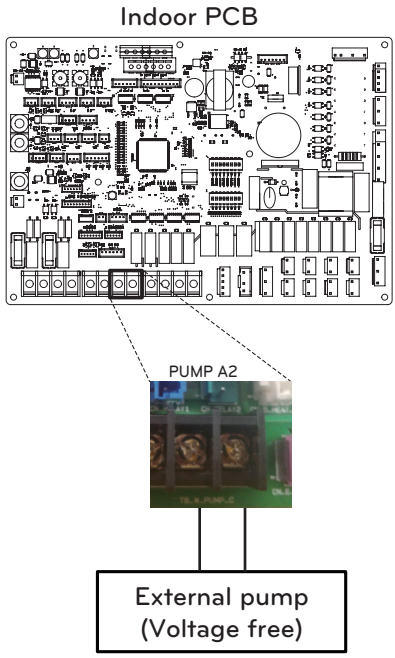
Step 1. Check if the power of the unit is turned off.

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

Step 3. Connect signal cable to terminal block fully.



(For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series)



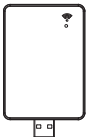
(For Split Indoor unit 5 Series, For Hydrosplit)

Wi-fi Modem

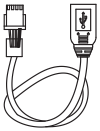
Wi-fi modem enables remote system operation from smartphone. Available functions include selection of on/off, operation mode, DHW heating, temperature setup and weekly scheduling etc. For detailed instructions, refer to the manual included in the accessories.

How to wire Wi-fi Modem

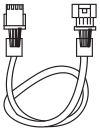
[Parts of Wi-fi modem]



Wi-fi modem body



USB Cable



Extension Cable

❊ Extension cable for Wi-Fi Modem : PWYREW000 (Sold Separately)

Follow below procedures step 1 ~ step 5.

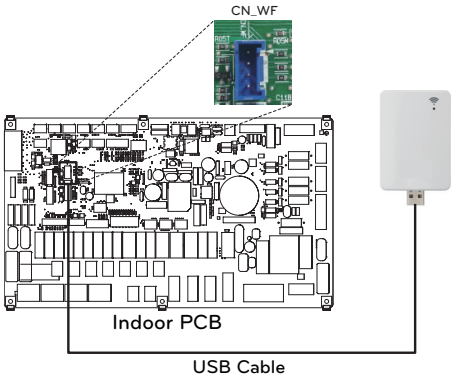
Step 1. Check if the power of the unit is turned off.

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

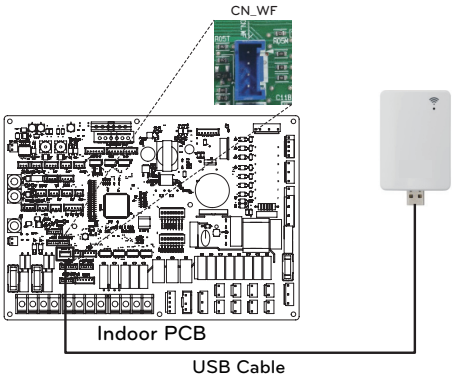
Step 3. Connect the USB cable to the indoor unit PCB (CN_WF ; Blue) until it clicks into place.

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.



(For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series)



(For Split Indoor unit 5 Series, For Hydrosplit)

Smart Grid (For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)

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

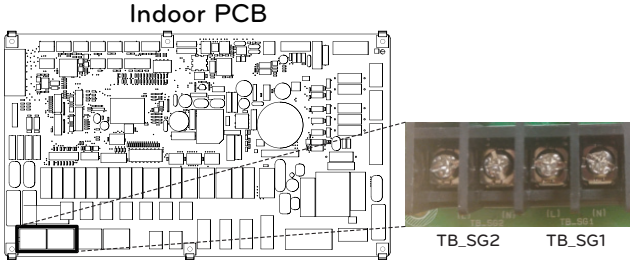
How to wire smart grid

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 Commend	Very Low Price	Maintain operation status	Target temperature change automatically to 80 °C

Energy State (For Split Indoor unit 5 Series, For Hydrosplit)

This product provides energy states that enable customers to use as much as possible of their own renewable energy. It can shift setpoints depending on input signal from Energy Storage System (ESS) or from any other third-party device using Modbus RTU or Digital 230V inputs.

Available Energy States

There are 8 energy states available. 4 fixed and 4 customizable - each with the possibility to enhance self-consumption of renewable energy.

Energy state	Command	Battery State of charge	Operation (standard setting)					
			Heating		Cooling		Domestic Hot Water	
			Setting	Range	Setting	Range	Setting	Range
1	Operation Off (Utility lock)	Low	Forced internal operation off	Fixed	Forced internal operation off	Fixed	Forced internal operation off	Fixed
2	Normal Operation	Normal	Maintain operation status	Fixed	Maintain operation status	Fixed	Maintain operation status	Fixed
3	Operation On Recommend	High	Increase 2 °C from target temperature	Fixed	Maintain operation Status	Fixed	Increase 5 °C from target temperature	Fixed
4	Operation On Recommend	Very High	Maintain operation status	Fixed	Maintain operation status	Fixed	DHW Target 80 °C	Fixed
5	Operation On Commend	Very High	Increase from target temperature	0/+30 (Default : +5)	Decrease from target temperature	0/-30 (Default : -5)	Increase from target temperature	0/+50 (Default : +30)
6	Operation On Recommend	High	Increase from target temperature	0/+30 (Default : +2)	Decrease from target temperature	0/-30 (Default : -2)	Increase from target temperature	0/+50 (Default : +10)
7	Operation Save	Low	Decrease from target temperature	0/-30 (Default : -2)	Increase from target temperature	0/+30 (Default : +2)	Decrease from Target Temperature	0/-50 (Default : 0)
8	Operation Super Save	Very Low	Decrease from target temperature	0/-30 (Default : -5)	Increase from target temperature	0/+30 (Default : +5)	Decrease from Target Temperature	0/-50 (Default : 0)

Digital Input for energy saving (ESS, Smart Grid) (For Split Indoor unit 5 Series, For Hydrosplit)

This product provides two digital inputs (ES1 / ES2) that can be used to switch between energy states when not using Modbus RTU (CN-COM).

Available Energy States

There are 8 energy states available in total. Four different states can be triggered using the 230V-inputs – by default Energy states 1-4.

With the digital input assignment in the menue 'Energy state/Digital input assignment of the control pane, different Energy states can be selected for Signals 0:1 and 1:1.

0:0 is always linked with ES2 (Normal operation) and 1:0 is always linked with ES1 (Operation off/Utility lock).

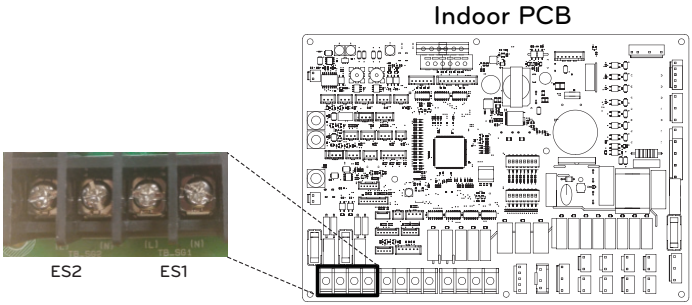
How to set Digital input signal

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 (ES2, ES1) fully as shown below.



Energy state depending on input signal (ES1 / ES2)

Input Signal		Output state	
ES1	ES2	Default	Range
0	0	ES2	fixed
1	0	ES1	
0	1	ES3	ES3-ES8
1	1	ES4	

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

THERMA V. supports following 2way valve.

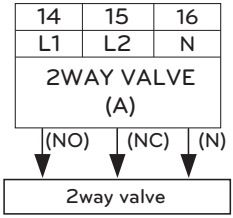
Type	Power	Operating Mode	Supported
NO 2-wire (1)	230 V AC	Energize : Valve Closing	Yes
		De-Energize : Valve Opening	
NC 2-wire (2)	230 V AC	Energize : Valve Closing	Yes
		De-Energize : Valve Opening	

(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.)

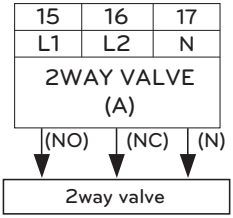
How to Wire 2Way Valve

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.

For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series
For Hydrosplit 1-Pipe



For Split Indoor unit 5 Series,
For Hydrosplit 2-Pipe



⚠ 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 reached below 16 °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

THERMA V 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.'

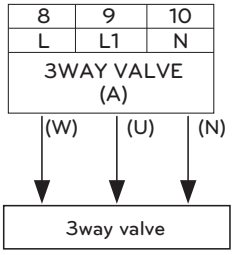
How to wire 3way valve(A)

Follow below procedures Step 1 ~ Step 2.

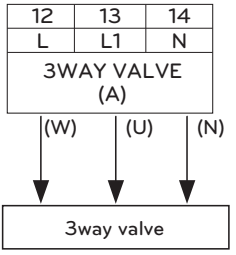
Step 1. Uncover front cover of the unit.

Step 2. Find terminal block and connect wire as below.

For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series
For Hydrosplit 1-Pipe



For Split Indoor unit 5 Series,
For Hydrosplit 2-Pipe



⚠ 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

THERMA V 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)

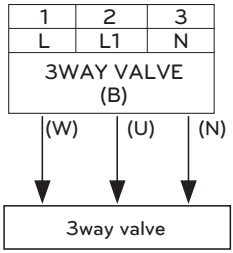
How to wire 3way valve(B)

Follow below procedures Step 1 ~ Step 2.

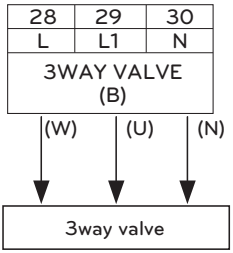
Step 1. Uncover front cover of the unit.

Step 2. Find terminal block and connect wire as below.

For Split R32 Indoor unit 4 Series,
For Split R410A Indoor unit 3 Series
For Hydrosplit 1-Pipe



For Split Indoor unit 5 Series,
For Hydrosplit 2-Pipe



⚠ 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

Final check

No.	Check point	Description
1	Connection of Water Inlet/Outlet	- 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	- Check the pressure of supplying water by using pressure gauge inside the unit - Pressure of Supplying water should be Under 3.0 bar approximately
3	Water pump capacity	- 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	- 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	- Check the power cord specifications (Refer to Chapter 4 'Connecting Cables')
6	3Way Valve	- Water should flow from Water outlet of the unit to sanitary tank Water inlet when sanitary tank heating is selected. - To verify the flow direction, Make sure that the water outlet temperature of the unit and water inlet temperature of sanitary Water tank are similar
7	2Way Valve	- 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 reached below 16 °C in cooling mode.
8	Air Vent	- 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')

CONFIGURATION

As THERMA V. is designed to satisfy various installation environment, it is important to set up system correctly. If not configured correctly, improper operation or degrade of performance can be expected.

DIP Switch Setting (For Split R32 Indoor unit 4 Series, For Split R410A Indoor unit 3 Series)

⚠ CAUTION

Turn off electric power supply before setting DIP switch
• Whenever adjusting DIP switch, turn off electric power supply to avoid electric shock.

General Information

Indoor PCB