

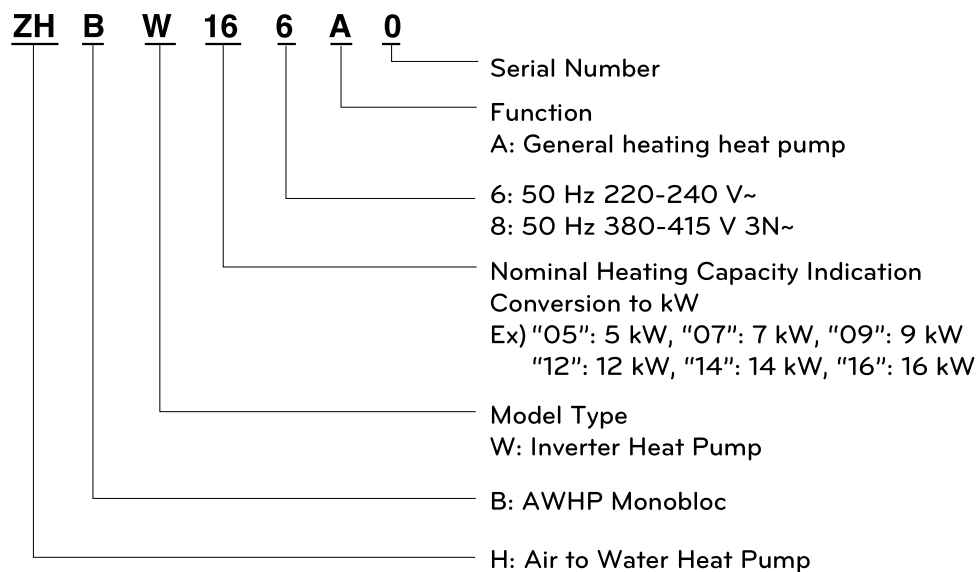
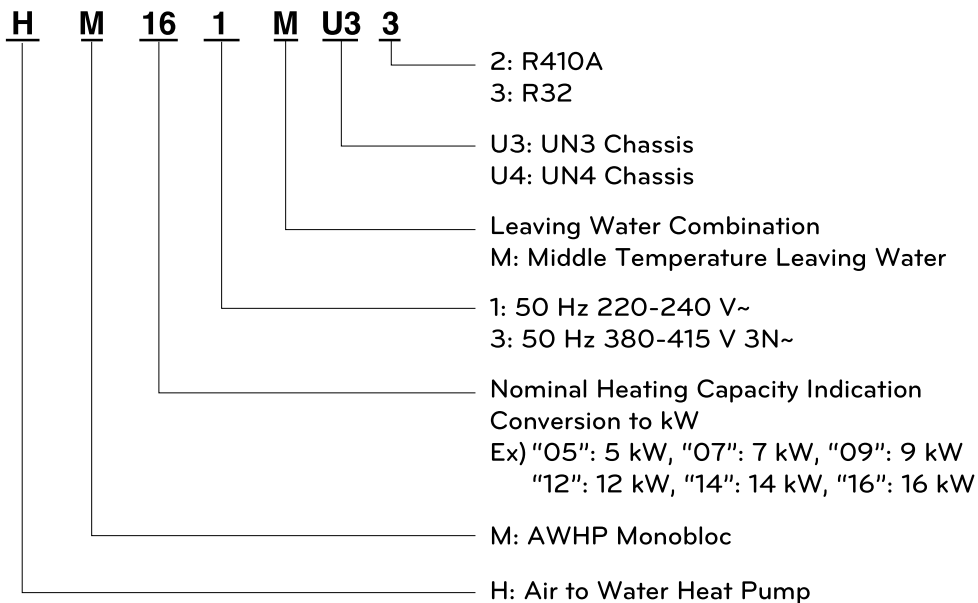
GENERAL INFORMATION

With advanced inverter technology, **THERMAV™** 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 **THERMAV™** is presented to identify the installation procedure. Before beginning installation, read this chapter carefully and find helpful information on installation.

Model Information

Buyer Model Name



- Additional Information : serial number is refer to the barcode on the product.
- Max allowable pressure :
High side : 4.32 MPa / Low side : 2.4 MPa
- Refrigerant : R32

Model name and related information

Model Name		Capacity		Power Source (Unit)
Phase	Capacity	Heating(kW) ^{*1}	Cooling(kW) ^{*2}	
1Ø	5 kW	5.5	5.5	220-240 V~ 50 Hz
	7 kW	7.0	7.0	
	9 kW	9.0	9.0	
	12 kW	12.0	12.0	
	14 kW	14.0	14.0	
	16 kW	16.0	16.0	
3Ø	12 kW	12.0	12.0	380-415 V 3N~ 50 Hz
	14 kW	14.0	14.0	
	16 kW	16.0	16.0	

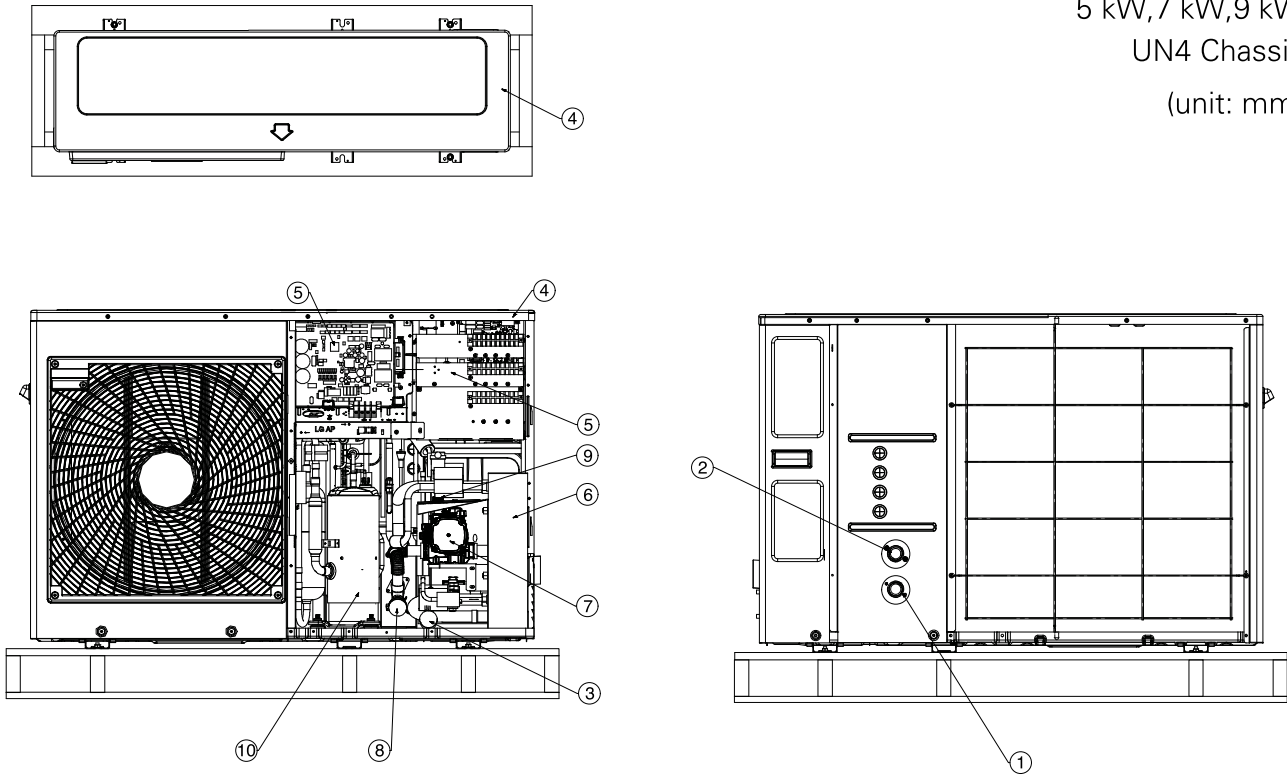
*1 : tested under EN14511
(water temperature 30 °C → 35 °C at outdoor ambient temperature 7 °C / 6 °C)

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

*3 : All appliances were tested at atmospheric pressure.

Parts and Dimensions

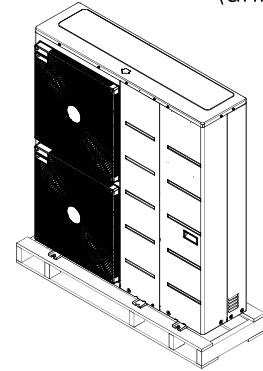
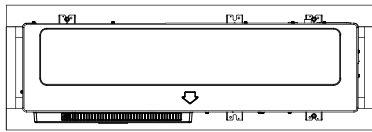
Product Heating Capacity :
 5 kW,7 kW,9 kW
 UN4 Chassis
 (unit: mm)



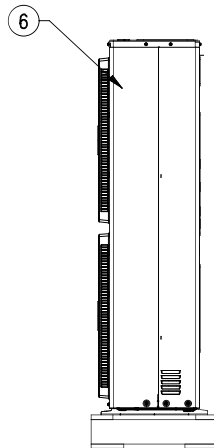
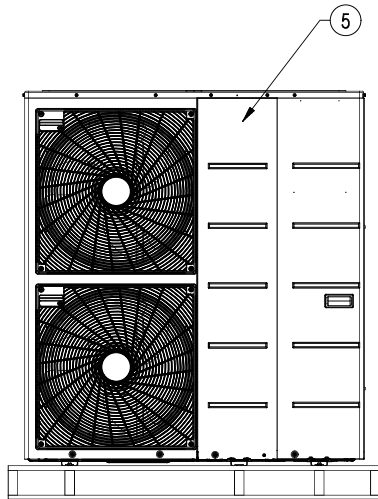
Description

No	Name	Remarks
1	Entering water pipe	Male PT 1 inch
2	Leaving water pipe	Male PT 1 inch
3	Strainer	Filtering and stacking particles inside circulating water
4	Top cover	-
5	Control Box	PCB and terminal blocks
6	Plate Heat Exchanger	Heat exchanger between refrigerant and water
7	Water Pump	Circulating the water
8	Pressure Gage	Indicates circulating water pressure
9	Safety valve	Open at water pressure 3 bar
10	compressor	-

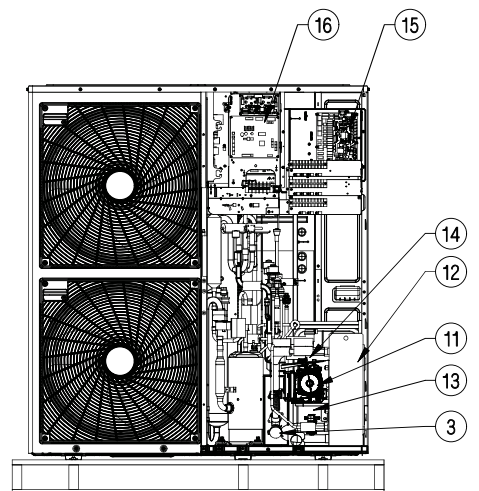
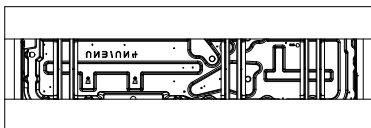
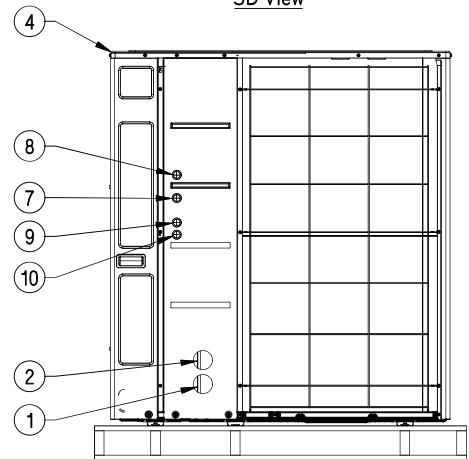
Product Heating
Capacity : 12 kW, 14
kW, 16 kW
UN3 Chassis
(unit: mm)



3D View



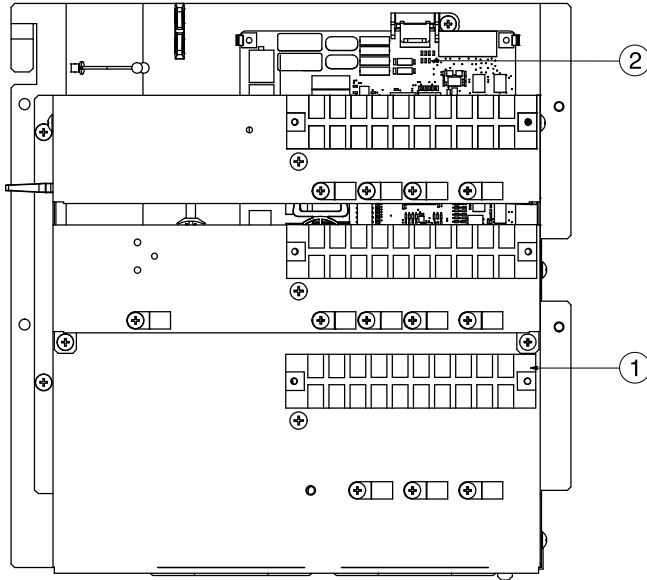
Side View



No	Name	Remarks
1	Entering water pipe	Male PT 1 inch
2	Leaving water pipe	Male PT 1 inch
3	Strainer	Filtering and stacking particles inside circulating water
4	Top cover	-
5	Front Panel	-
6	Side Panel	-
7	Signal A	Network Kit cables
8	Signal B	Network Kit cables
9	Signal C	-
10	Outdoor Entry Power Cable	-
11	Water Pump	Circulating the water
12	Plate Heat Exchanger	Heat exchanger between refrigerant and water
13	Pressure Gage	Indicates circulating water pressure
14	Safety valve	Open at Water pressure 3 bar
15	Heater Control Box	Heater PCB and terminal blocks
16	Outdoor Control Box	Outdoor PCB and terminal blocks

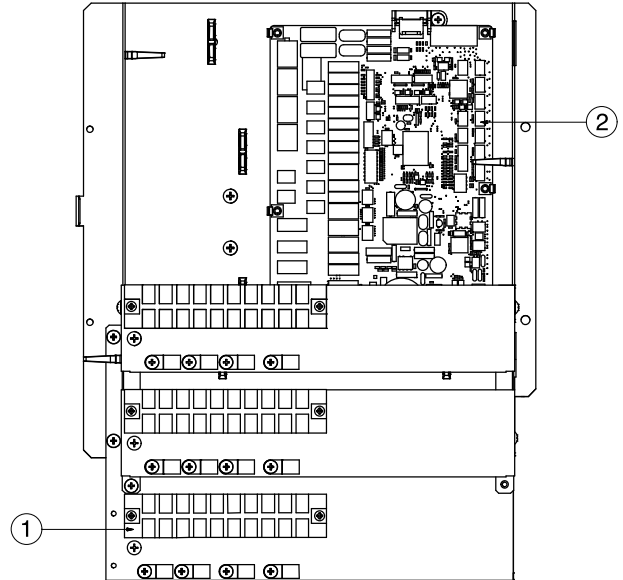
Control Parts

1Ø : 5 kW, 7 kW, 9 kW



1Ø : 12 kW, 14 kW, 16 kW

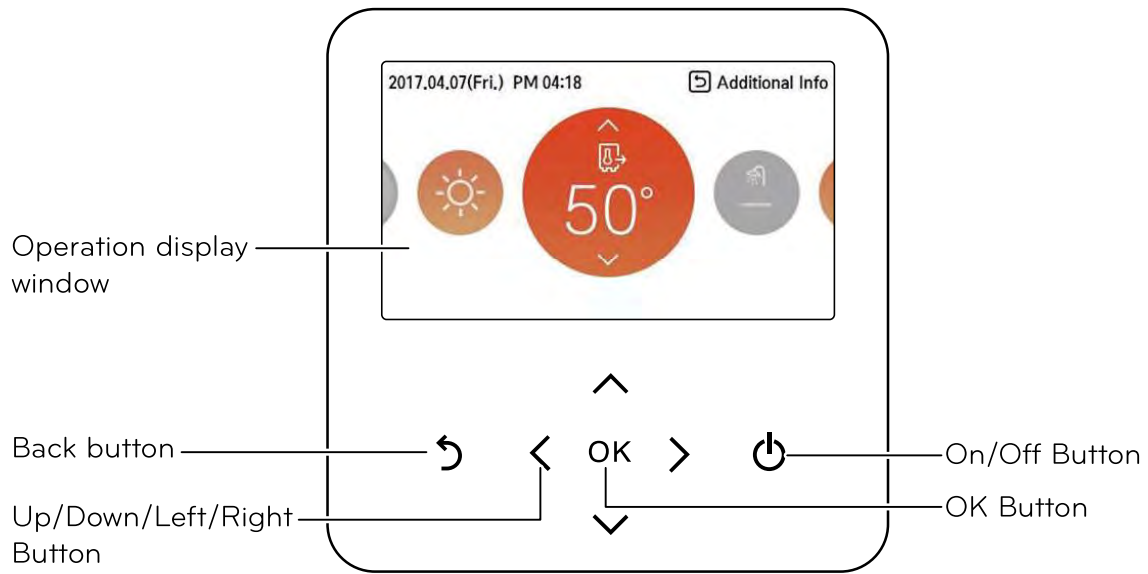
3Ø : 12 kW, 14 kW, 16 kW



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

Remote Controller



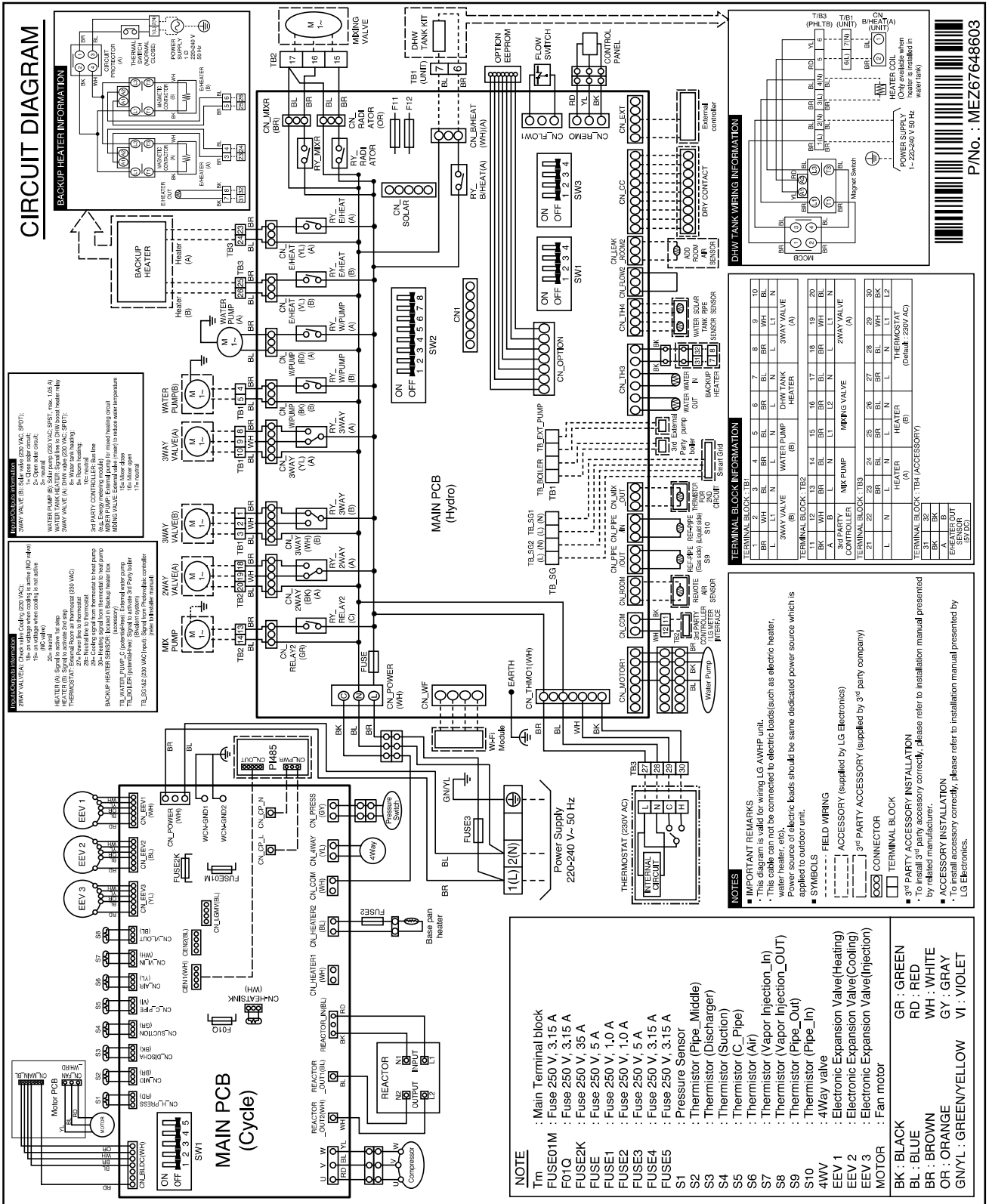
Operation display window	Operation and Settings status display
Back button	When you move to the previous stage from the menu's setting stage
Up/down/left/right button	When you change the menu's setting value
OK button	When you save the menu's setting value
On/Off button	When you turn ON/OFF the Unit

Wiring Diagram

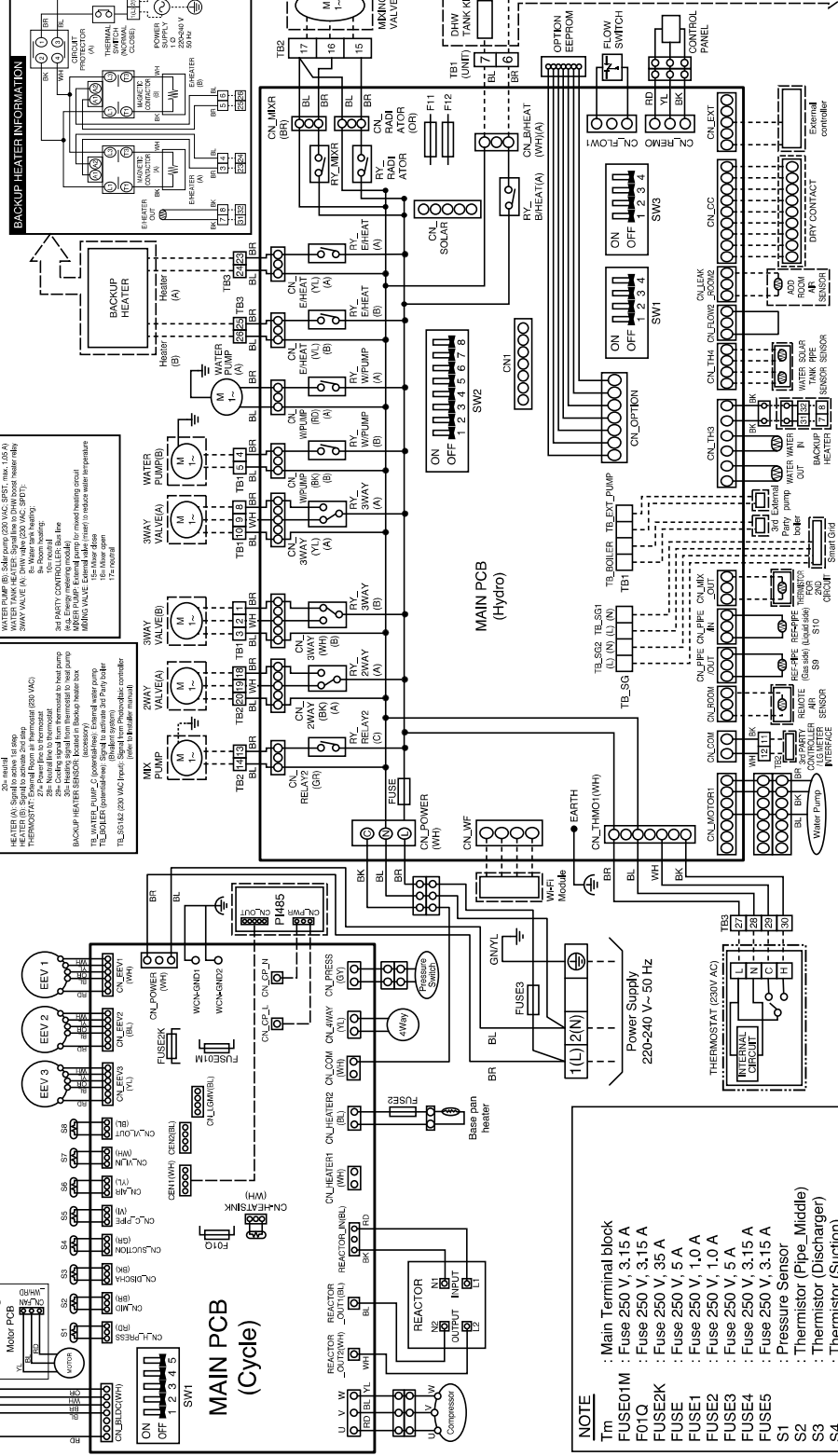
- Refer to the attached wiring diagram.

Wiring Diagram : (Including Field wiring) :

1Ø : 5 kW, 7 kW, 9 kW



CIRCUIT DIAGRAM

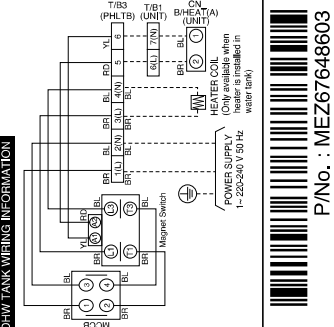


BACKUP HEATER INFORMATION

- 3WAY VALVE (B) : Solar valve (200 VAC, 50Hz)
- WATER PUMP (B) : Solar pump (230 VAC, 50Hz, max. 1.05 A)
- WATER TANK HEATER : Standby to DHW boost heater relay
- 3RD PARTY CONTROLLER : Standby
- MIXING VALVE (A) : Water tank heating
- 3RD PARTY CONTROLLER : Standby
- WATER PUMP (A) : Water tank heating
- MIXING VALVE (B) : Water tank heating
- 3RD PARTY CONTROLLER : Standby
- WATER PUMP (B) : Water tank heating
- MIXING VALVE (A) : Water tank heating
- 3RD PARTY CONTROLLER : Standby
- WATER PUMP (A) : Water tank heating
- MIXING VALVE (B) : Water tank heating

IMPORTANT REMARKS

- This cable can not be connected to electric loads (such as electric heater, water heater, etc).
- Power source of electric loads should be same dedicated power source which is applied to outdoor unit.
- SYMBOLS
- FIELD WIRING
- ACCESSORY (supplied by LG Electronics)
- 3RD PARTY ACCESSORY (supplied by 3rd party company)
- CONNECTOR
- TERMINAL BLOCK
- 3RD PARTY ACCESSORY INSTALLATION
- To install 3rd party accessory correctly, please refer to installation manual presented by related manufacturer.
- ACCESSORY INSTALLATION
- To install accessory correctly, please refer to installation manual presented by LG Electronics.



TERMINAL BLOCK INFORMATION

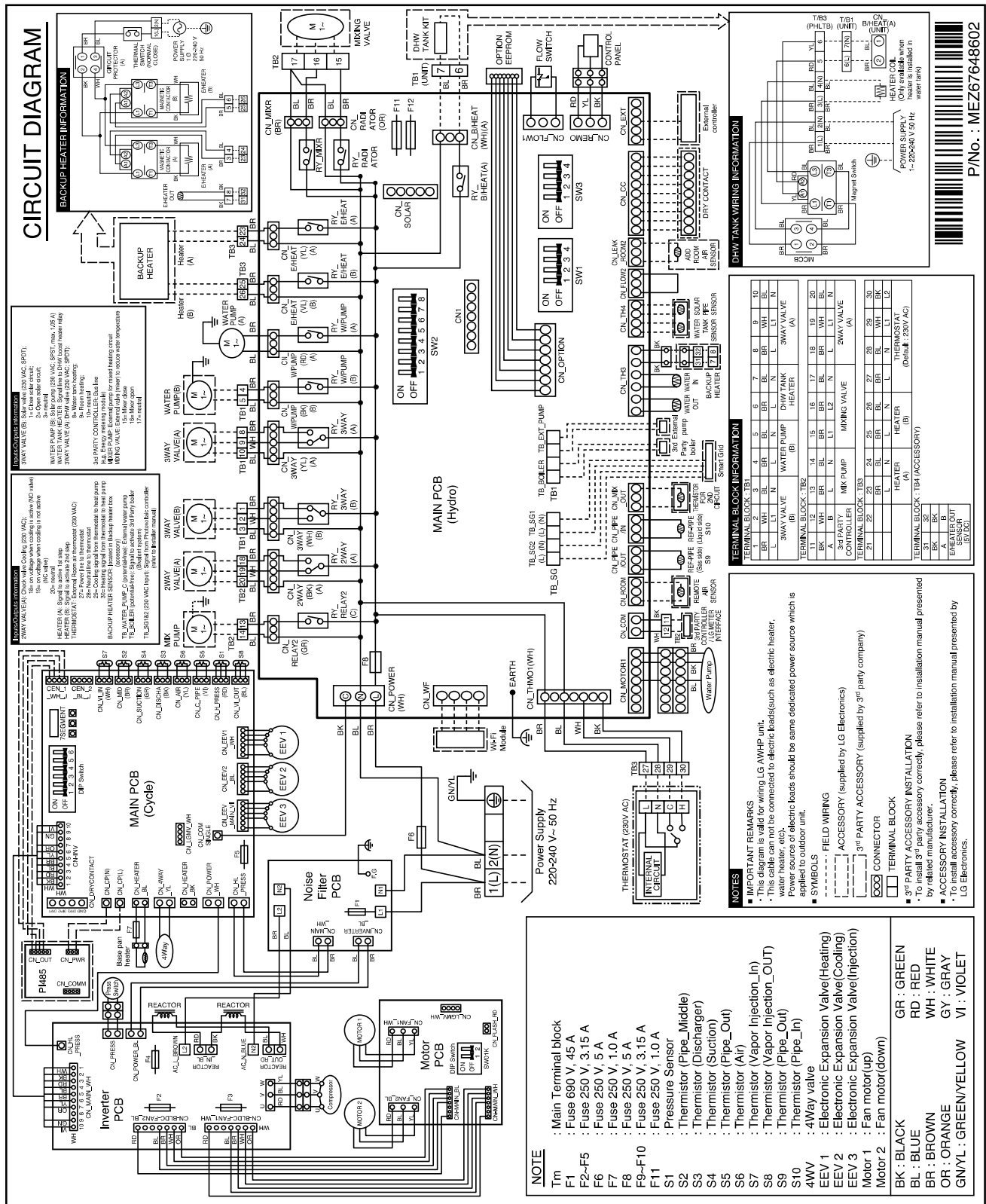
Terminal Block	Terminal	Component
TERMINAL BLOCK : TB1	1	3WAY VALVE (A)
	2	3WAY VALVE (B)
	3	WATER PUMP (A)
	4	WATER PUMP (B)
	5	DHW TANK HEATER
	6	3WAY VALVE (A)
	7	3WAY VALVE (B)
	8	3WAY VALVE (A)
	9	3WAY VALVE (B)
	10	3WAY VALVE (A)
TERMINAL BLOCK : TB2	11	3RD PARTY CONTROLLER (A)
	12	3RD PARTY CONTROLLER (B)
	13	3RD PARTY CONTROLLER (C)
	14	3RD PARTY CONTROLLER (D)
	15	3RD PARTY CONTROLLER (E)
	16	3RD PARTY CONTROLLER (F)
	17	3RD PARTY CONTROLLER (G)
	18	3RD PARTY CONTROLLER (H)
	19	3RD PARTY CONTROLLER (I)
	20	3RD PARTY CONTROLLER (J)
TERMINAL BLOCK : TB3	21	HEATER (A)
	22	HEATER (B)
	23	HEATER (C)
	24	HEATER (D)
	25	HEATER (E)
	26	HEATER (F)
	27	HEATER (G)
	28	HEATER (H)
	29	HEATER (I)
	30	HEATER (J)
TERMINAL BLOCK : TB4 (ACCESSORY)	31	THERMOSTAT (A)
	32	THERMOSTAT (B)
	33	THERMOSTAT (C)
	34	THERMOSTAT (D)
	35	THERMOSTAT (E)
	36	THERMOSTAT (F)
	37	THERMOSTAT (G)
	38	THERMOSTAT (H)
	39	THERMOSTAT (I)
	40	THERMOSTAT (J)

- NOTE**
- Tm : Main Terminal block
 - FUSE01M : Fuse 250 V, 3.15 A
 - F01Q : Fuse 250 V, 3.15 A
 - FUSE2K : Fuse 250 V, 3.15 A
 - FUSE : Fuse 250 V, 5 A
 - FUSE1 : Fuse 250 V, 5 A
 - FUSE2 : Fuse 250 V, 1.0 A
 - FUSE3 : Fuse 250 V, 5 A
 - FUSE4 : Fuse 250 V, 3.15 A
 - FUSE5 : Fuse 250 V, 3.15 A
 - S1 : Pressure Sensor
 - S2 : Thermistor (Pipe, Middle)
 - S3 : Thermistor (Discharge)
 - S4 : Thermistor (Suction)
 - S5 : Thermistor (C_Pipe)
 - S6 : Thermistor (Air)
 - S7 : Thermistor (Vapor Injection_In)
 - S8 : Thermistor (Vapor Injection_Out)
 - S9 : Thermistor (Pipe_Out)
 - S10 : Thermistor (Pipe_In)
 - 4WV : 4Way valve
 - EEV 1 : Electronic Expansion Valve(Heating)
 - EEV 2 : Electronic Expansion Valve(Cooling)
 - EEV 3 : Electronic Expansion Valve(Injection)
 - MOTOR : Fan motor
- Color Code:**
- BK : BLACK
 - BL : BLUE
 - BR : BROWN
 - OR : ORANGE
 - GN/YL : GREEN/YELLOW
 - GR : GREEN
 - RD : RED
 - WH : WHITE
 - GY : GRAY
 - VI : VIOLET



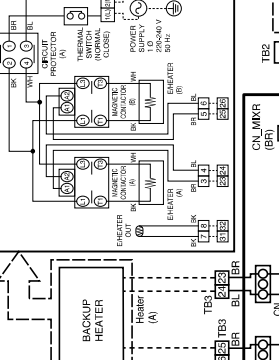
Wiring Diagram : (Including Field wiring) :

1Ø : 12 kW, 14 kW, 16 kW

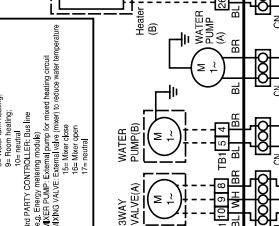


CIRCUIT DIAGRAM

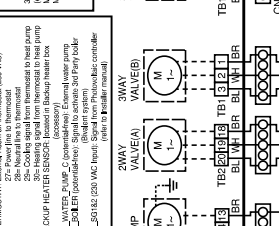
BACKUP HEATER INFORMATION



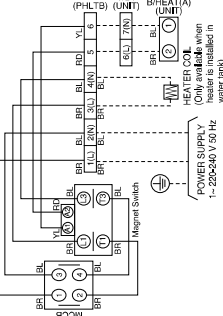
MAIN PCB (Hydro) INFORMATION



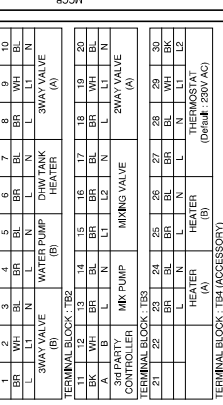
MAIN PCB (Cycle) INFORMATION



DHW TANK WIRING INFORMATION



TERMINAL BLOCK WIRING INFORMATION



NOTES

- IMPORTANT REMARKS
 - This diagram is valid for wiring LG AWHP unit.
 - This cable can not be connected to electric leads (such as electric heater, water heater, etc).
 - Power source of electric basis should be same dedicated power source which is applied to outdoor unit.
- SYMBOLS
 - FIELD WIRING
 - ACCESSORY (supplied by LG Electronics)
 - 3rd PARTY ACCESSORY (supplied by 3rd party company)
 - CONNECTOR
 - 3rd PARTY ACCESSORY INSTALLATION
 - ACCESSORY INSTALLATION
 - To install accessory correctly, please refer to installation manual presented by LG Electronics.

NOTE

- Tm : Main Terminal block
- F1 : Fuse 690 V, 45 A
- F2-F5 : Fuse 250 V, 3.15 A
- F6 : Fuse 250 V, 5 A
- F7 : Fuse 250 V, 1.0 A
- F8 : Fuse 250 V, 5 A
- F9-F10 : Fuse 250 V, 3.15 A
- F11 : Fuse 250 V, 1.0 A
- S1 : Pressure Sensor
- S2 : Thermistor (Pipe_Middle)
- S3 : Thermistor (Pipe_Discharger)
- S4 : Thermistor (Suction)
- S5 : Thermistor (Pipe_Out)
- S6 : Thermistor (Air)
- S7 : Thermistor (Vapor Injection_In)
- S8 : Thermistor (Vapor Injection_OUT)
- S9 : Thermistor (Pipe_Out)
- S10 : Thermistor (Pipe_In)
- 4WV : 4Way valve
- EEV 1 : Electronic Expansion Valve(Heating)
- EEV 2 : Electronic Expansion Valve(Cooling)
- EEV 3 : Electronic Expansion Valve(Injection)
- Motor 1 : Fan motor(up)
- Motor 2 : Fan motor(down)

- BK : BLACK
- BL : BLUE
- BR : BROWN
- OR : ORANGE
- GN/YL : GREEN/YELLOW
- VI : VIOLET
- GR : GREEN
- RD : RED
- WH : WHITE
- GY : GRAY



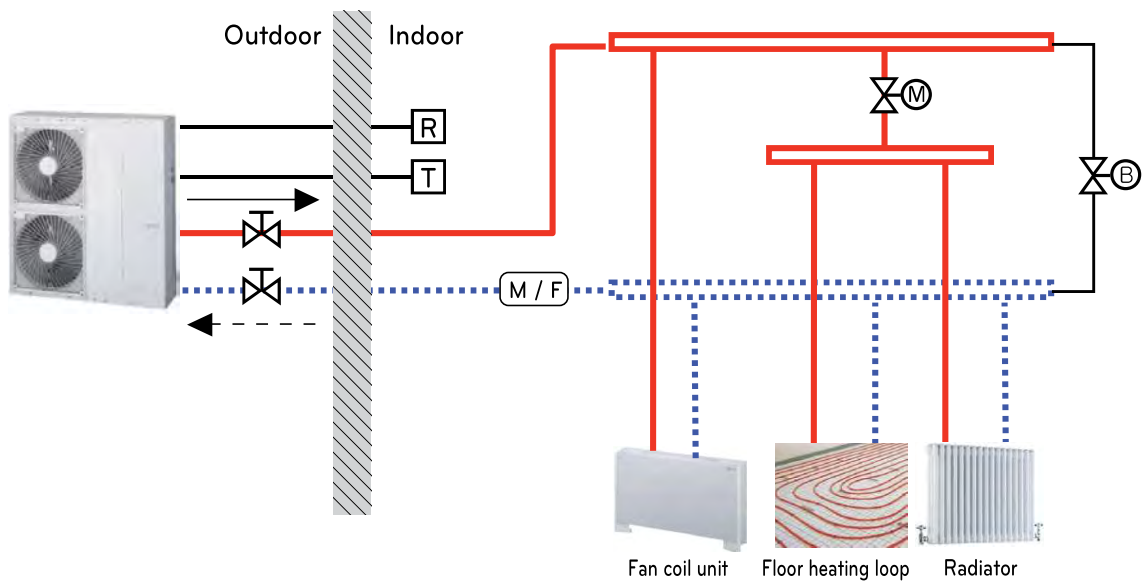
Typical Installation Example

CAUTION

If **THERMAV™** is installed with pre-existing boiler, the boiler and **THERMAV™** should not be operated together. If entering water temperature of **THERMAV™** 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 4 and chapter 7 of **THERMAV™** 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 4 and chapter 7 of **THERMAV™** 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

..... Low Temperature

(M / F) Magnetic Filter (Mandatory)

T Room Thermostat (Field supply)

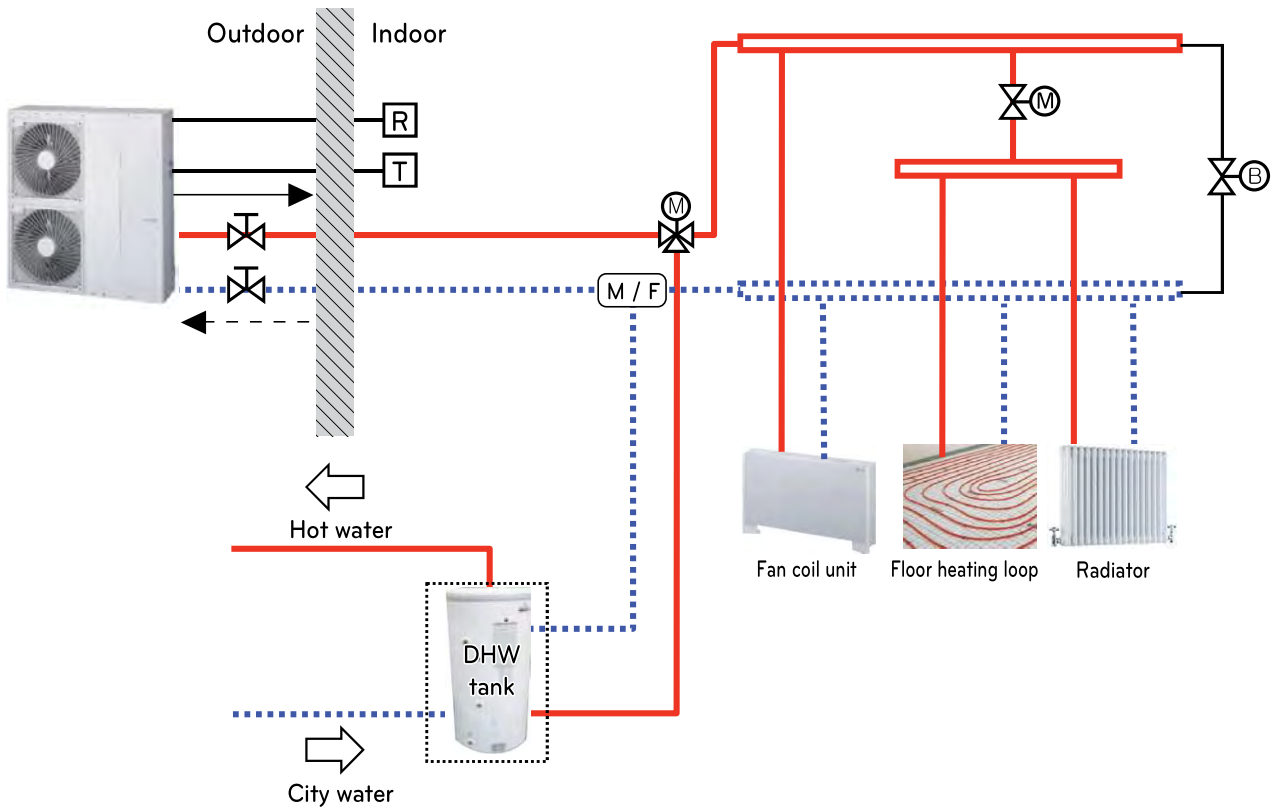
M 2way valve (Field supply)

Shut-off valve

B By-pass valve(Field supply)

R Remote controller

CASE 2: Connecting DHW Tank



NOTE

- DHW tank
 - It should be equipped with internal electric 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 4 and chapter 7 of **THERMAV** installation manual.

— High Temperature

... Low Temperature

⊞ Shut-off valve

M / F Magnetic Filter (Mandatory)

⊞ T Room Thermostat(Field supply)

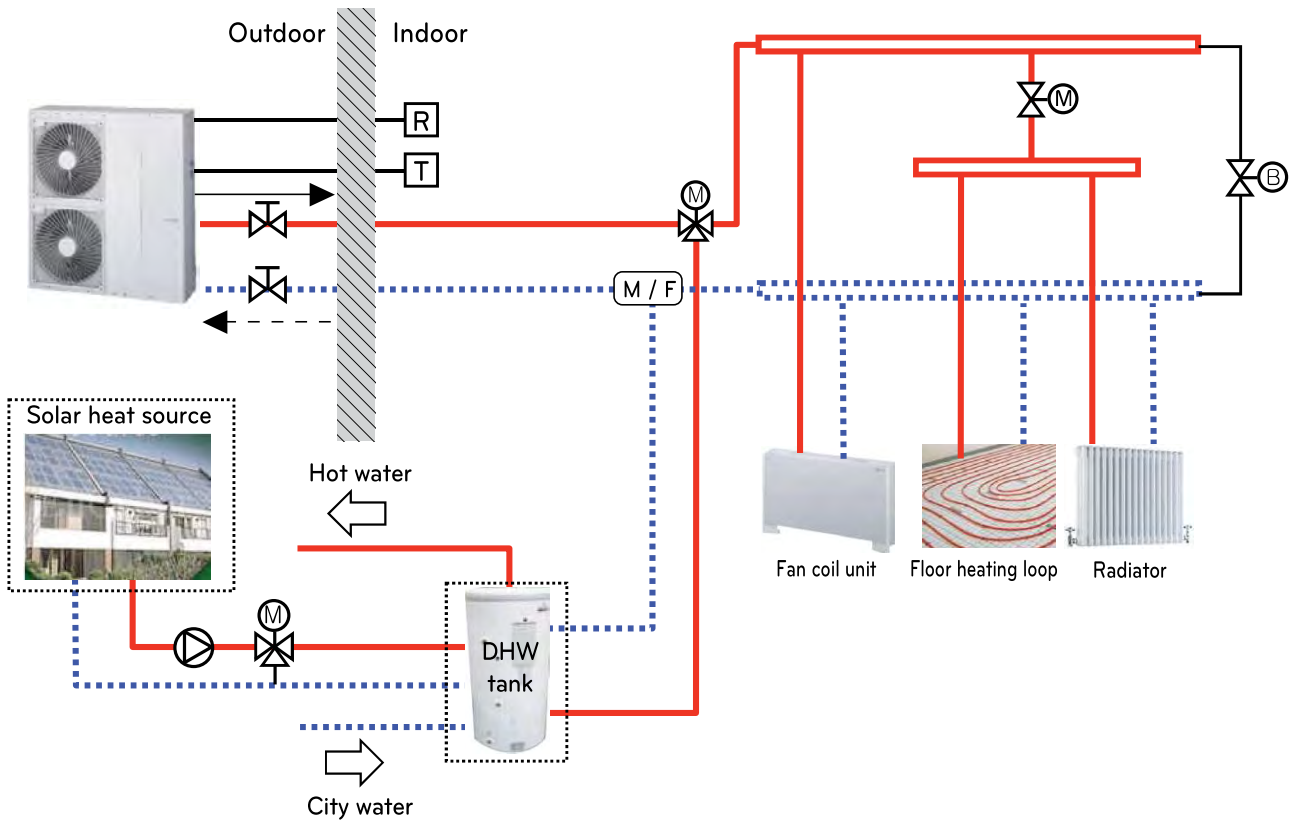
⊞ M 2way valve (Field supply)

⊞ B By-pass valve(Field supply)

⊞ R Remote controller

⊞ M 3way valve (Field supply)

CASE 3: Connecting Solar thermal system



NOTE

- DHW tank
 - It should be equipped with internal electric 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

... Low Temperature

⊗ Shut-off valve

(M / F) Magnetic Filter (Mandatory)

T

Room Thermostat(Field supply)

M

2way valve
(Field supply)

B

By-pass valve(Field supply)

R

Remote controller

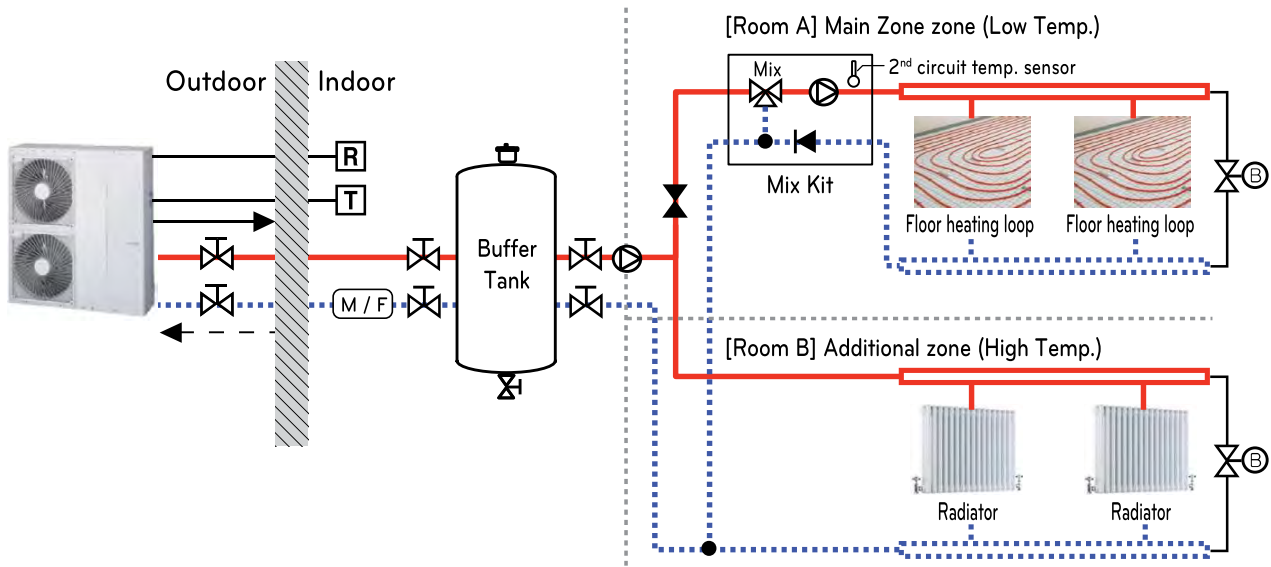
M

3way valve
(Field supply)

P

Pump(Field supply)

CASE 4: Connecting 2nd Circuit

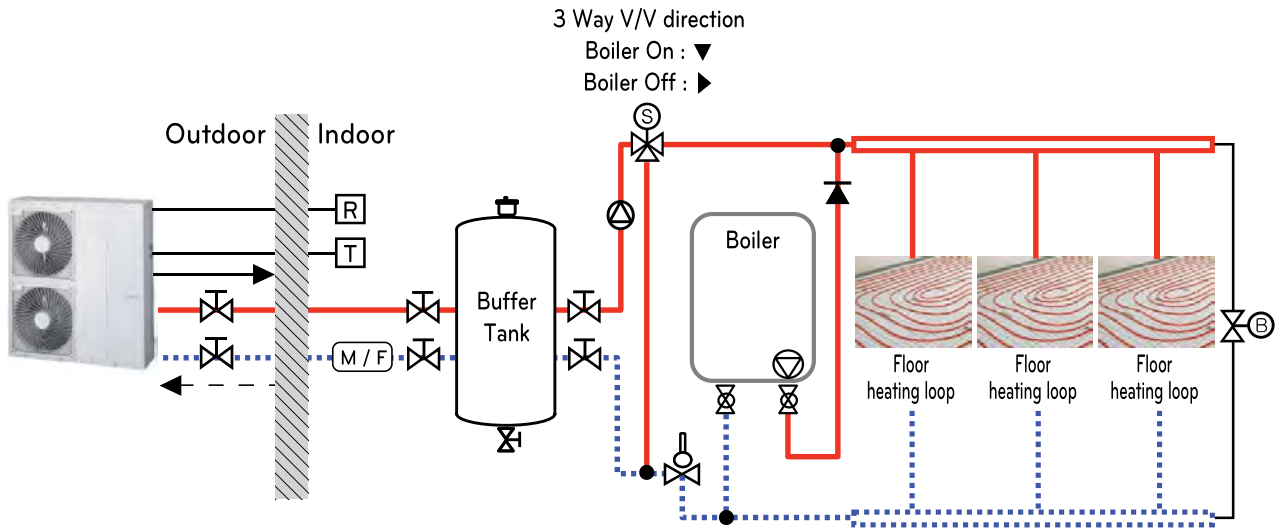


NOTE

- Mix Kit
 - You can install it when you want to set the temperature of two rooms individually
 - When heating, Main Zone can not be higher than Add Zone.
 - When cooling, Main Zone can not be lower than Add Zone.
 - The types and specifications of the Mix Kit are to comply with Chapters 4 and 7 of the THERMA V Installation Manual.

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

CASE 5: Connecting 3rd Party

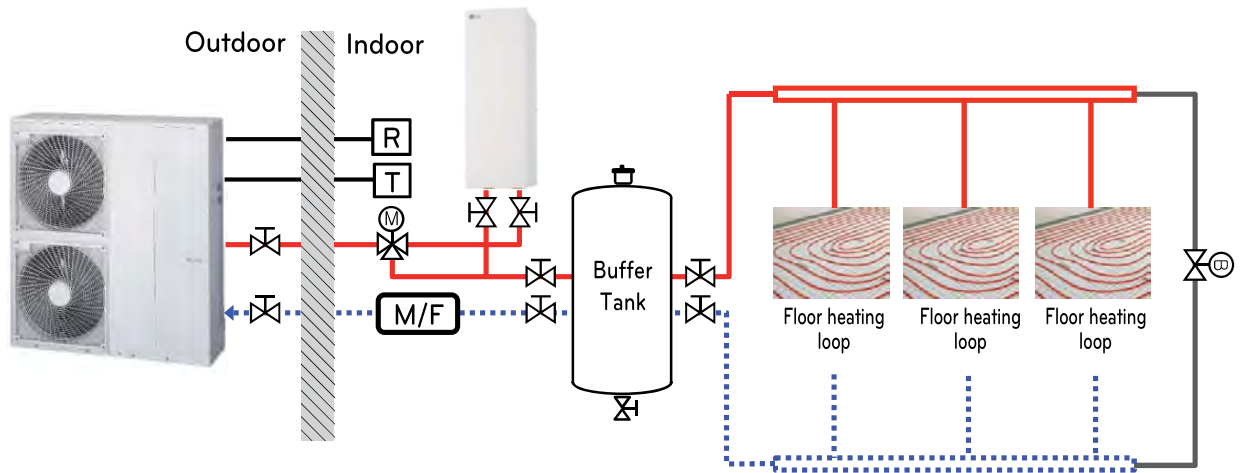


NOTE

- DHW tank
 - 3rd Party Boiler
 - You can control the boiler automatically and manually by comparing the outside temperature and the set temperature.
- 3way valve
 - It is a valve for DHW use.
 - Not installed when installing Buffer Tank
 - Type of 3way valve and specification should be complied with chapter 4 and chapter 7 of installation manual.

	High Temperature		Room Thermostat(Field supply)		3way valve (Field supply)
	Low Temperature		2way valve (Field supply)		Pump(Field supply)
	Shut-off valve		By-pass valve(Field supply)		AquaStat V/V
	Magnetic Filter (Mandatory)		Air vent (Field supply)		
	Reverse check valve				

CASE 6 : Connecting backup heater



! NOTE

- Backup heater(Accessory)
 - You can retain sufficient capacity even though ambient temperature will be decreased in winter.

— High Temperature

..... Low Temperature

[M / F] Magnetic Filter (Mandatory)

[T] Room Thermostat (Field supply)

[M] 3way valve (Field supply)

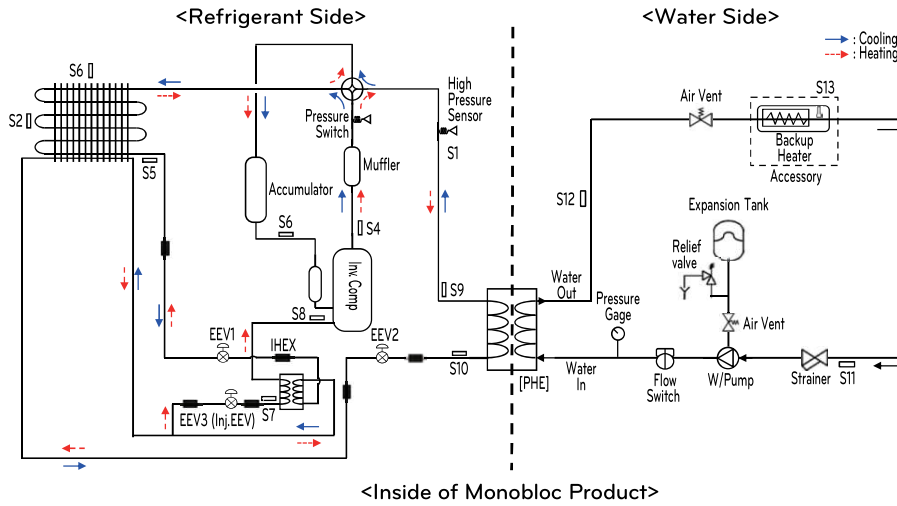
[R] Remote controller

[X] Shut-off valve

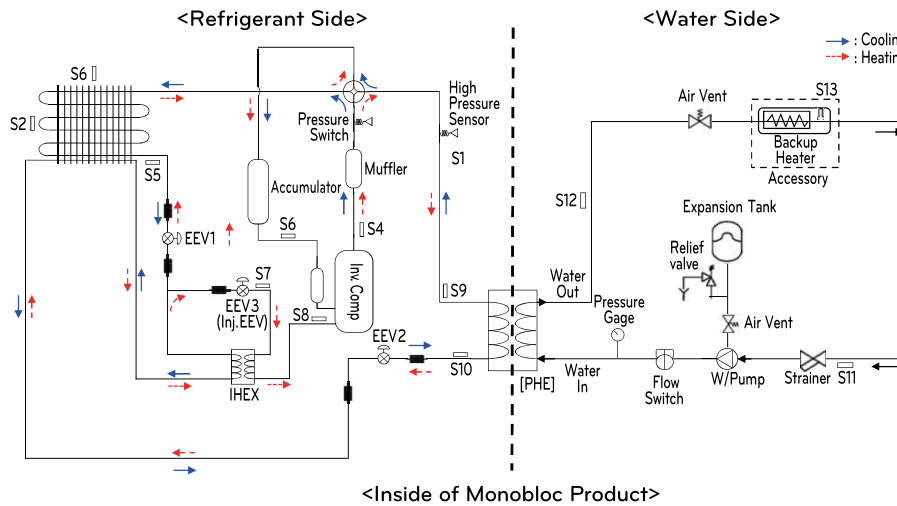
[B] By-pass valve (Field supply)

Cycle Diagram

1Ø : 12 kW, 14 kW, 16 kW ; 3Ø : 12 kW, 14 kW, 16 kW



1Ø : 5 kW, 7 kW, 9 kW

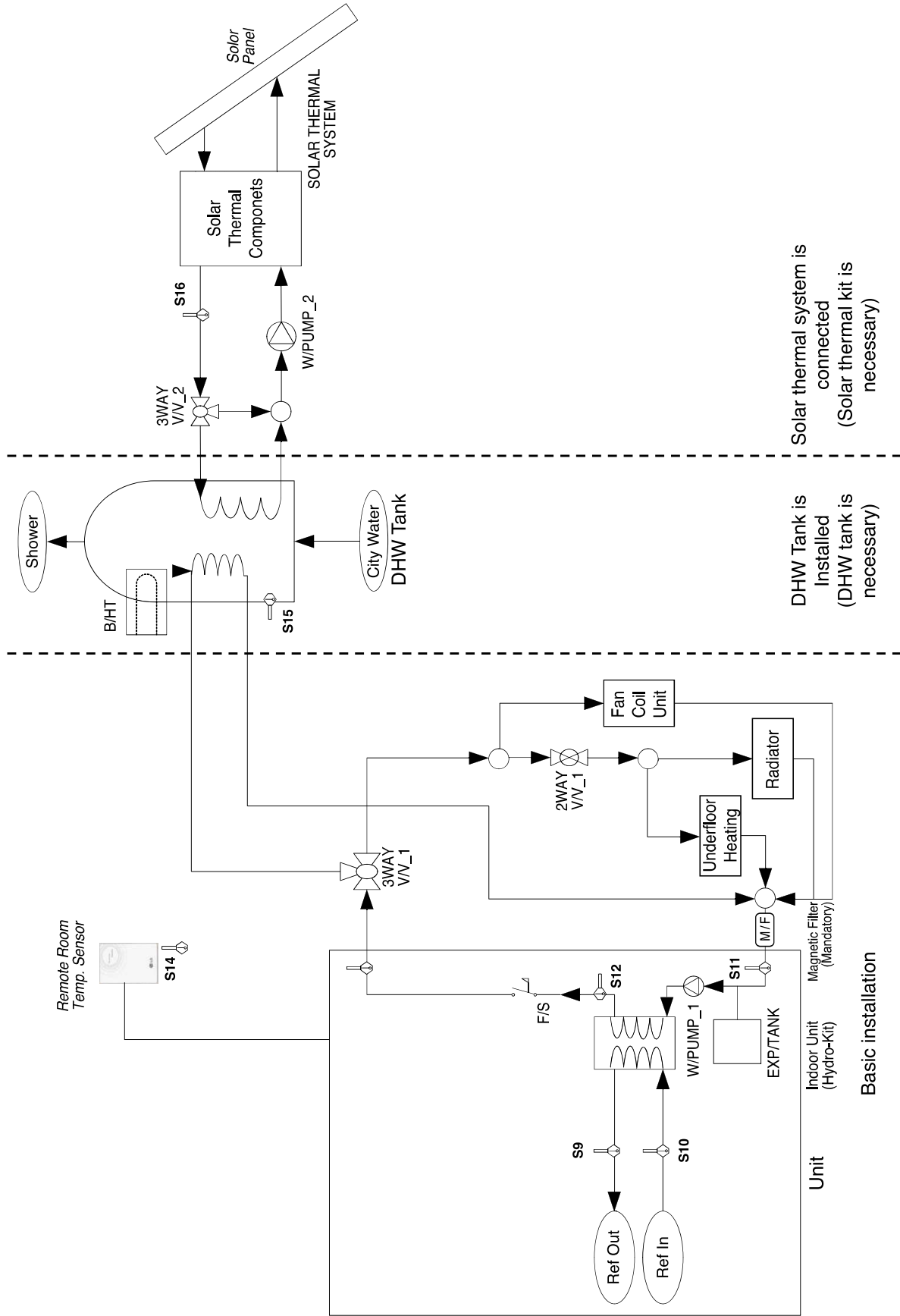


Description

Category	Symbol	Meaning	PCB Connector
Indoor Unit	S1	High 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
	S6	Outdoor air temperature sensor	CN_AIR
	S7	Inlet IHEX temperature sensor	CN_VI_IN
	S8	Outlet IHEX temperature sensor	CN_VI_OUT
	S9	PHEX gas temp. sensor	CN_PIPE_OUT
	S10	PHEX liquid temp. sensor	CN_PIPE_IN
Water Side	S11	Entering water temperature sensor	CN_TH3
	S12	Leaving water temperature sensor	
	S13	Electric backup heater outlet(Accessory kit)	

-S9, S10, S5 : Description is expressed based on Cooling mode.

Water cycle



DHW Tank is installed (DHW tank is necessary)

Solar thermal system is connected (Solar thermal kit is necessary)

Basic installation

Description

Category	Symbol	Meaning	PCB Connector	Remarks
Unit	S9	Refrigerant temperature sensor (Gas side)	CN_PIPE_OUT	- Meaning is expressed based on Cooling mode.
	S10	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	
	S7	Inlet IHEX temperature sensor	CN_VI_IN	
	S8	Outlet IHEX temperature sensor	CN_VI_OUT	
	S3	Compressor-discharge pipe temperature sensor	CN_DISCHA	
	F/S	Flow Switch	CN_FLOW1	
	E/HT	Electric Heater	CN_E/HEAT(A) CN_E/HEAT(B)	- Optional accessory (sold separately) - Model : HA**1A E1 - 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(220-240 V~ 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,
	S14	Remote Air temperature sensor	CN_ROOM	- Optional accessory (sold separately) - Model : PQRSTA0
	CTR/PNL	Remote Controller	CN_REMO	
	2WAY V/V_1	To control water flow for Fan Coil Unit	CN_2WAY(A)	- 3 rd party accessory and Field installation (sold separately) - 2 wire NO or NC type 2way valve is supported.
	M / F	Magnetic Filter	(No connector)	- 3 rd party accessory and Field installation (sold separately) - It is Mandatory to install an additional filter on the heating water circuit.
Water Heating	W/TANK	DHW Tank	(no connector)	- 3 rd party accessory and Field installation (sold separately) - Generating and storing DHW by AWHP or built-in electric heater
	B/HT	Booster heater(in DHW tank)	CN_B/HEAT(A)	- 3 rd 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 unit. - Flow direction switching between underfloor and water tank	CN_3WAY(A)	- 3 rd 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
	S15	W/TANK water temperature sensor	CN_TH4	- S15 and S16 are connected at 4 pin type connector CN_TH4. - S15 is a part of DHW tank kit.(Model : PHLTB) - S16 is a part of solar thermal kit (Model:PHLLA)
S16	Solar-heated water temperature sensor			
Solar Heating	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)	- 3 rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	W_PUMP/2	External Water Pump	CN_W/PUMP(B)	- 3 rd 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 by LG AWHP Solar-Kit.	(no connector)	- 3 rd party accessory and Field installation (sold separately)