MIM-E03✳

SAMSUNG CONTROL KIT
installation manual

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ⒺⓈⒻⒾⓅⒹ DB98-34413A(2)

SAMSUNG

Contents

Safety precautions

Carefully follow the precautions listed as below because they are essential to guarantee the safety of SAMSUNG product.

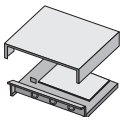
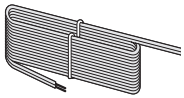
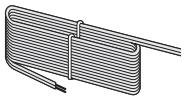
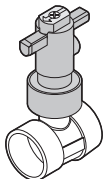
WARNING

- Always disconnect a power supply of Air-Water Heat Pump before servicing it or accessing components inside the unit.
- Verify that installation and testing operations shall be performed by qualified personnel.
- To prevent serious damage on the system and injuries to users, precautions and other notices shall be observed.

Warning

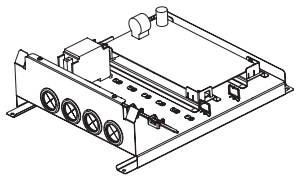
- Carefully read the contents of this manual before installing the control kit and store the manual in a safe place in order to be able to use it as reference after installation.
- For maximum safety, installers should always carefully read the following warnings.
- Store the manual in a safe location and remember to hand it over to the new owner if the kit is sold or transferred.
- The kit is compliant with the requirements of the Low Voltage Directive (72/23/EEC), the EMC Directive (89/336/EEC) and the Directive on pressurized equipment (97/23/EEC).
- The manufacturer shall not be responsible for damage originating from unauthorized changes or the improper connection of electric and hydraulic lines. Failure to comply with these instructions or to comply with the requirements set forth in the "Operating limits" table, included in the manual, shall immediately invalidate the warranty.
- Do not use the units if you see some damages on the units and recognize something bad such as loud noisy, smell of burning.
- In order to prevent electric shocks, fires or injuries, always stop the unit, disable the protection switch and contact SAMSUNG's technical support if the unit produces smoke, if the power cable is hot or damaged or if the unit is very noisy.
- Always remember to inspect the unit, electric connections, and protections regularly. These operations shall be performed by qualified personnel only.
- The unit contains various electric parts, which should be kept out of the reach of children.
- Do not attempt to repair, move, alter or reinstall the unit by unauthorized personnel, these operations may cause product damage, electric shocks and fires.
- Do not place containers with liquids or other objects on the unit.
- All the materials used for the manufacture and packaging of the air to water heat pump are recyclable.
- The packing materials must be disposed of in accordance with local regulations.
- Wear protective gloves to unpack, move, install, and service the unit to avoid your hands being injured by the edge of the parts.
- Do not touch the internal parts while running the units.
- Inspect the product shipped and check if damaged during transport. If the product has some damages, DO NOT INSTALL and immediately discuss about the damages with the carrier or retailer (if the installer or the authorized technician has collected the material from the retailer.)
- Our units shall be installed in compliance with the spaces described in the installation manual, to ensure accessibility from both sides and allow repairs or maintenance operations to be carried out. If the units installed without complying with procedures described in manual, additional expenses can be asked because special harnesses, ladders, scaffolding or any other elevation system for repair service will NOT be considered part of the warranty and will be charged to the end customer.
- When service works required, make sure to disconnect the power supply at least 1 minute to prevent electric shocks.
  - Always check the voltage at the terminals of main PCB before trying to touch.
- Use electric wires which manual designated. Connections between wires and terminals shall be assembled without any tension. If the assembly works is not implemented well, it can lead to have product damages and fires.
- After wiring works, terminal block cover shall be fixed firmly. Without cover, it can cause to have product damage and fire.

Product specifications

Item	Description	
	MIM-E03A	
	Wired remote controller	
	Temp. Sensor	blue cable(15m) for DHW
		red cable(15m) for backup heater
	Remote controller cable (1EA, 10m)	
	Smart Grid cable (1EA, 2m)	
	Flow Switch (1EA) (Set point : Min. 16LPM)	

❊ Temp. sensor = Temperature sensor

Main components

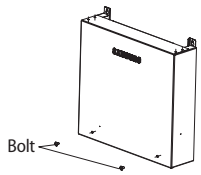
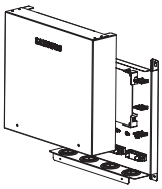
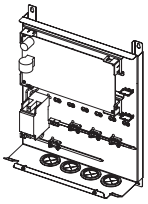
Model name	MIM-E03A		
Detail components		Parts	Qty.
		Main PBA	1
		ELCB(30A)	1
		Grounding screw	6
		Rubber	4
		Base plate	1
		Top cover plate	1
		Case screw	2
Weight (Net)	3.5kg		
Packing size (W x H x D)	329mm x 439mm x 168mm		

Installing the unit

Deciding on where to install the unit

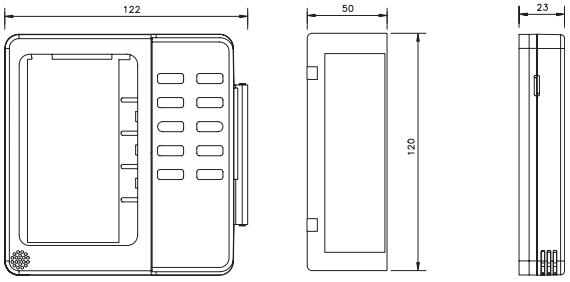
- Install the unit in indoor and do not install it outside. The unit is designed only for indoor.
- Direct heat can make the kit have some failures in operation.
- Choose locations that are dry and sunny, but not exposed to direct sunlight or strong winds.
- Choose location where pipes and cables can be easily connected to the indoor unit.
- Avoid locations where flammable elements and explosive chemicals are stored.
- Choose a specific wall which can withstand the weight of unit and an external force.

Mounting the unit

Procedure	Remark
1. Remove 2 bolts from the unit.	
2. Open the top cover and install 4 screws on the wall.	
3. Close the top cover and install 2 bolts again into the unit.	

Installing the remote controller

Dimension

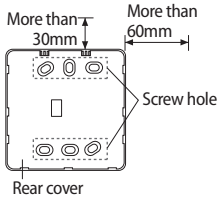


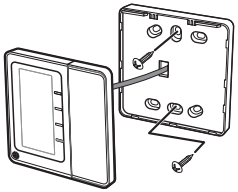
(Unit : mm)

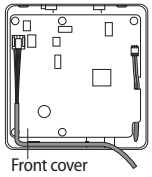
Installing the unit

Installation

1. Open the wired remote controller by pushing up the top cover of the remote controller while holding the rear cover firmly. The wired remote controller opens in the way of slide.
2. Install the rear cover of the wired remote controller on the wall with the supplied screws. After that, arrange the power cables on rear side of the front cover.





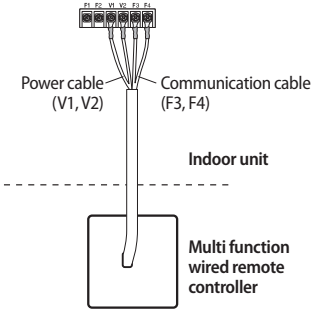


❋ Before fixing the rear cover, clear 30mm of space on the top and 60mm on the right side.

❋ Fasten the screw in the screw hole.

3. Connect the orange and brown wires from the wired remote controller to the power cable (V1, V2) of indoor unit. Connect the red and black wires to the communication cable (F3, F4) of indoor unit.

▶ Terminal type cable connection



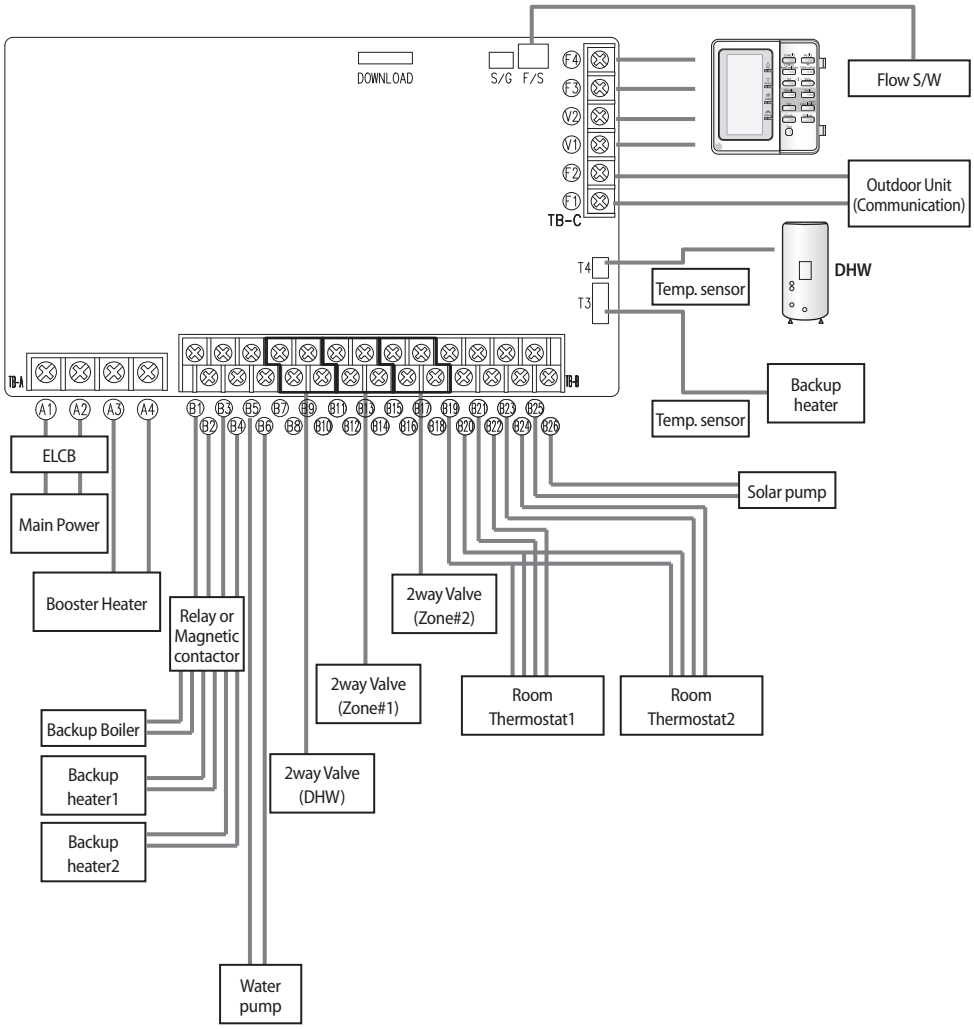
4. Reassemble the wired remote controller.
   When you reassemble the wired remote controller, match the grooves on the left side.

CAUTION

- When using an extension cable, make sure that the communication cable and the power cable is installed separately. (If not, it may cause malfunction of the wired remote controller.)
- Power cable of the wired remote controller(V1,V2) should be connected to the one indoor unit only.

Wiring works

Overall schematics

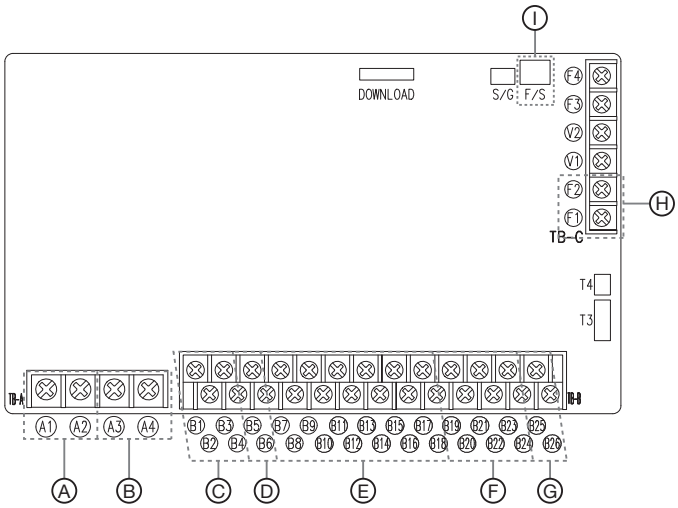


NOTE

- ELCB : Earth leakage circuit breaker

ENGLISH

Wiring works

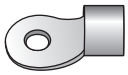


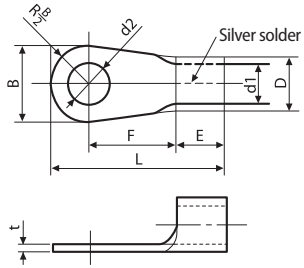
▶ Output

Description		PORT No.	Input/Output	AC/DC	Maximum running current
A	Main power supply	A1, A2	Input	AC	30A
B	Booster heater	A3, A4	Output	AC	20A
C	Backup heater & boiler (relay or magnetic contactor control)	B1, B2, B3, B4	Output	AC	0.5A
D	Water pump	B5, B6	Output	AC	2A
E	2way valve	B7~B18	Output	AC	0.5A
F	Room thermostat	B19, B20	Output	AC	0.5A
		B21~B24	Input	AC	10mA
G	Solar pump	B25, B26	Input	AC	10mA
H	Communication line (RS485)	F1, F2	Input/Output	DC	10mA
I	Flow switch	F/S	Input	DC	1mA

Selecting solderless ring terminal

- Select a solderless ring terminal of a connecting power cable based on a nominal dimensions for cable.
- Cover a solderless ring terminal and a connector part of the power cable and then connect it.





Nominal dimensions for cable (mm²)		1.5	2.5	4/6		10	16	25		35		50	70
Nominal dimensions for screw (mm)		4	4	4	8	8	8	8	8	8	8	8	8
B	Standard dimension (mm)	8	9.5	9.5	15	15	16	12	16.5	16	22	22	24
	Allowance (mm)	±0.2	±0.2	±0.2		±0.2	±0.2	±0.3		±0.3		±0.3	±0.4
D	Standard dimension (mm)	3.4	4.2	5.6		7.1	9	11.5		13.3		13.5	17.5
	Allowance (mm)	+0.3 -0.2	+0.3 -0.2	+0.3 -0.2		+0.3 -0.2	+0.3 -0.2	+0.5 -0.2		+0.5 -0.2		+0.5 -0.2	+0.5 -0.4
d1	Standard dimension (mm)	1.7	2.3	3.4		4.5	5.8	7.7		9.4		11.4	13.3
	Allowance (mm)	±0.2	±0.2	±0.2		±0.2	±0.2	±0.2		±0.2		±0.3	±0.4
E	Min.	4.1	4.1	6		7.9	9.5	11		12.5		17.5	18.5
F	Min.	6	7	5	9	9	13	15	13	13	13	14	20
L	Max.	16	17.5	20	28.5	30	33	34		38	43	50	51
d2	Standard dimension (mm)	4.3	5.3	4.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	Allowance (mm)	+0.2 0	+0.2 0	+0.2 0	+0.4 0	+0.4 0	+0.4 0	+0.4 0		+0.4 0		+0.4 0	+0.4 0
t	Min.	0.7	0.8	0.9		1.15	1.45	1.7		1.8		1.8	2.0

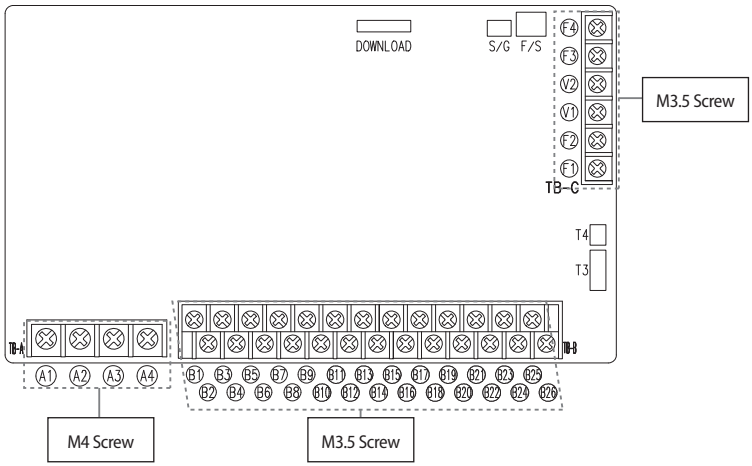
Wiring works

Selection for the power and booster heater wire terminal

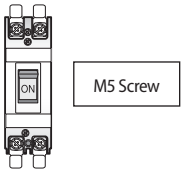
- Connect the cables to the terminal board using the solderless ring terminal.
- Use certified and verified cables.
- Connect using a driver which is able to apply the rated torque to the screws.
- If the terminal is loose, fire may occur caused by arc.
  If the terminal is connected too firmly, the terminal may be damaged.
- External force should not be applied to the terminal block and wires.
- The cable ties to fasten the wire should be an incombustible material, V0 or above.
  (The cable ties should be used to fasten the power wire and they are supplied with the unit.)

Tightening Torque(kgf•cm)		
M3.5	8 ~ 10	Wired remote controller, Communication(F1,F2)
M4	12 ~ 15	1 phase AC power : backup heater, water pump, valve, room controller, solar pump
M5	20 ~ 25	1 phase AC power, heater out, ELCB AC power

- Main PCB



- ELCB



Grounding work

▶ Grounding must be done by a qualified installer for your safety.

Grounding the power cable

▶ The standard of grounding may vary according to the rated voltage and installation place of the air conditioner.

▶ Ground the power cable according to the following.

Installation place / Power condition	High humidity	Average humidity	Low humidity
Electrical potential of lower than 150V		Perform the grounding work 3. Note 1)	Perform the grounding work 2 if possible for your safety. Note 2)
Electrical potential of higher than 150V	Must perform the grounding work 3. Note 1) (In case of installing circuit breaker)		

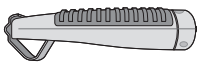
Note 1) Grounding work 3

- Grounding must be done by your installation specialist.
- Check if the grounding resistance is lower than 100Ω. When installing a circuit breaker that can cut the electric circuit in case of a short circuit, the allowable grounding resistance can be 30~500Ω.

Note 2) Grounding at dry place

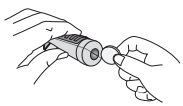
- The grounding resistance is should be lower than 100Ω. (It should not be higher than 250Ω)

✻ Examples to use cable striper



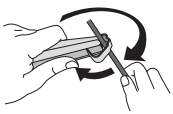
<Cable striper>

1. Adjust the blade position by coin(the controller is at the bottom side of the tool). Fix the blade position according to the outer sheath thickness of the power cable.

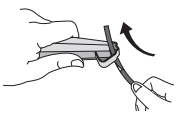


2. Fix the power cable and tool by using the hook at the top side of the tool.

3. Cut out the outer sheath of the power cable by revolving the tool in the direction of the arrow, two or three times.



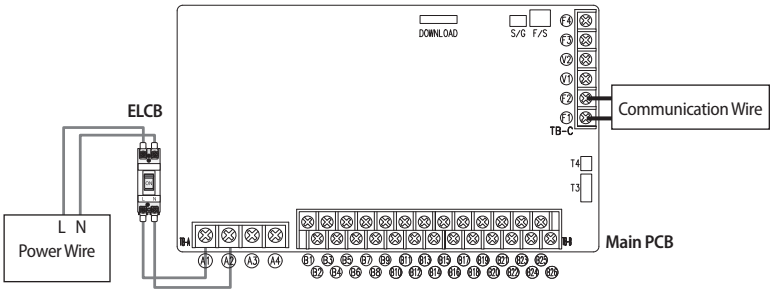
4. At this situation, cut out the outer sheath of the power cable by moving the tool toward the arrow direction expressed.



5. Slightly bend the wire and pull out the cut part of the outer sheath.

Wiring works

Power and communication with outdoor unit



CAUTION

- Be careful when connecting L, N.

Connecting the power wire

1. Connect 'Live' and 'Neutral' power line with 'L, N' of a ELCB.
2. Connect 'L,N' of a ELCB with 'A1 and A2' in TB-A.
3. Connect 'Protective Earth' line with 'Earth screw' In case.

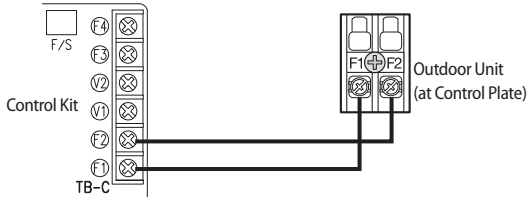
Recommended wire specification

Load	Power Supply	Power Cable	Max. Length	Type GL
		mm², wires	m	A
Do NOT use Heater (Water Pump, Valve, Wired RMC)	1Ø, 220-240V, 50Hz	1.5 / 3	L < 10m	10~
		2.5 / 3	10m < L	10~
Use Booster Heater (Max. 3kW)		4.0 / 3	L < 10m	30
		6.0 / 3	10m < L	30

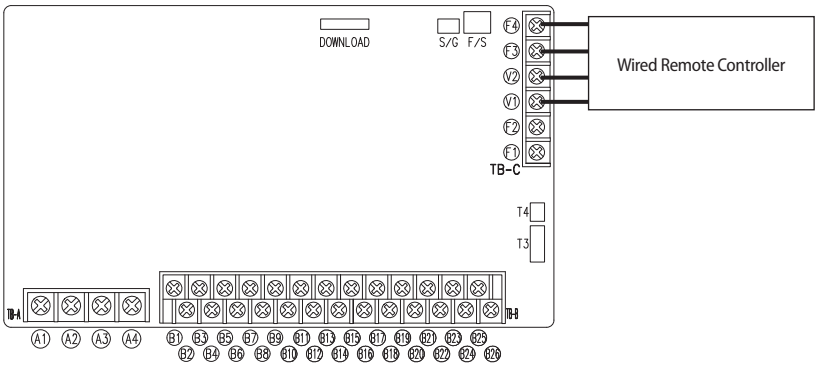
- The power cable is not supplied with air conditioner
- This equipment with "IEC 61000-3-12".
- Supply cords of parts of appliances for control kit use shall not be lighter than polychloroprene sheathed flexible cord (Code designation IEC:60245 IEC 57 / CENELEC:H05RN-F)

Connecting the communication wire

- Connect 'outdoor unit's F1&F2' with 'control kit's F1&F2 in TB-C' by 2 core cable.



Communication with a wired remote controller



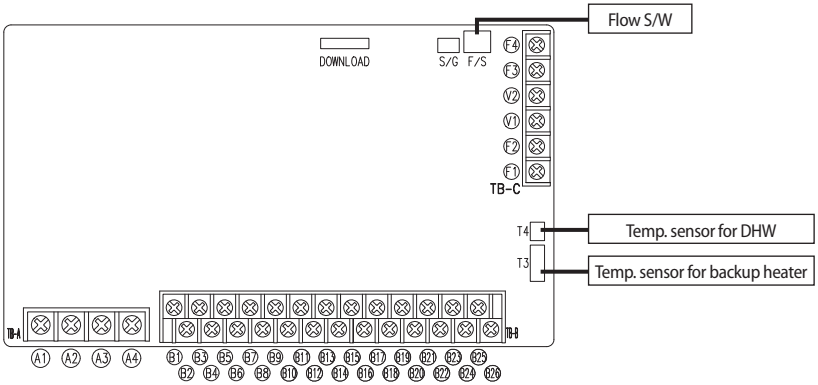
Connecting a wired remote controller

1. Connect 'V1, V2, F3, F4' of TB-C kit with 'V1, V2, F3, F4' of a wired remote controller.

▶ 2 units (wired remote controllers) are able to be installed on TB-C.

▶ When 2 units are installed, either one shall has "Master" setting and another one shall have "Slave" settings on a wired remote controller.

Temp. Sensor for DHW, Booster heater and a water Flow S/W



Connecting a temp. sensor wire into DHW

1. Put the sensor side of a temp. sensor wire into the designated location in a DHW.
2. Connect the other side of the line at T4.

Connecting a temp. sensor wire into a backup heater

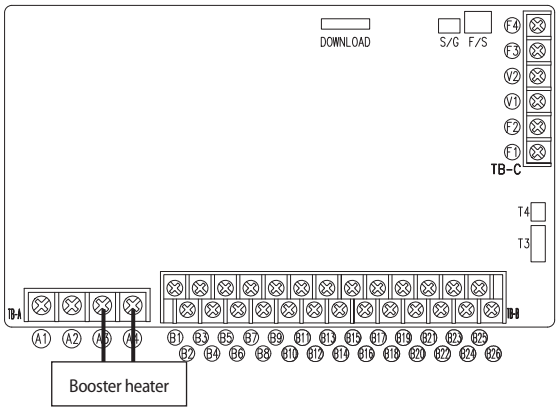
1. Put the sensor side of a temp. sensor wire into the designated location in a backup heater.
2. Connect the other side of the line at T3.

Connecting a flow switch

1. Install a flow switch in water line.
2. Connect a wire of a flow switch into 'F/S' connector.

Wiring works

Booster heater



Connecting a booster heater (a resistor heater – allowed limit : Max. 3kW)

1. Directly connect a 'Booster heater' with 'A3 and A4 ' in TB-A.

NOTE
- Wire spec : 4.0 mm²
- Code designation IEC : 60245 IEC 57 / CENELEC : H05RN-F

Connecting a booster heater (PTC heater – allowed limit : Max. 3kW)

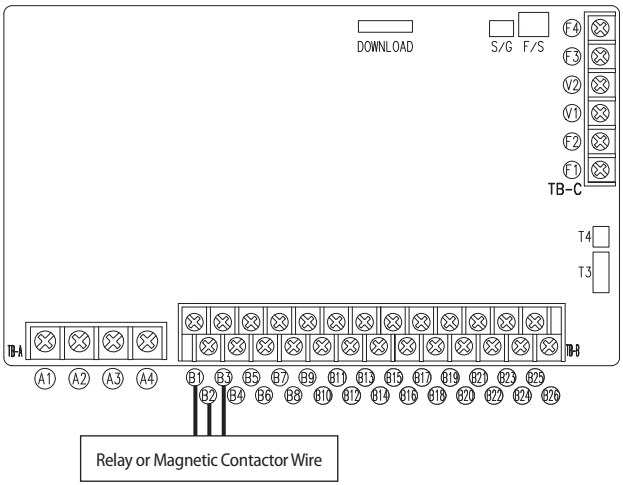
1. Directly connect a 'Booster heater' with 'A3 and A4 ' in TB-A.

NOTE
- Wire spec : 6.0 mm²
- Code designation IEC : 60245 IEC 57 / CENELEC : H05RN-F

Specification table

Part	Specification
Terminal Block (output)	A3, A4 of TB-A
Connection load	Direct connection a booster heater
Output (A3, A4)	AC 230V (MAX 20A)

Backup heater

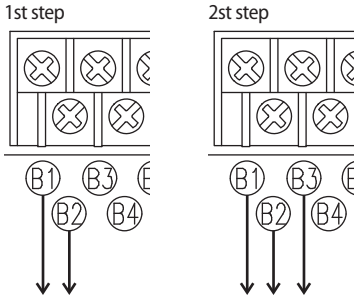


Connecting a relay or a magnetic contactor for a backup heater (Not Directly connect a backup heater)

1. Connect a 'relay or a magnetic contactor' with 'B1, B2 and B3' in TB-B.

▶ When a backup heater mode is "ON" at 1st step, a control signal of AC230V goes through B1 and B2.

▶ When a backup heater mode is "ON" at 2nd step, a control signal of AC230V goes through B1 and B3.



NOTE

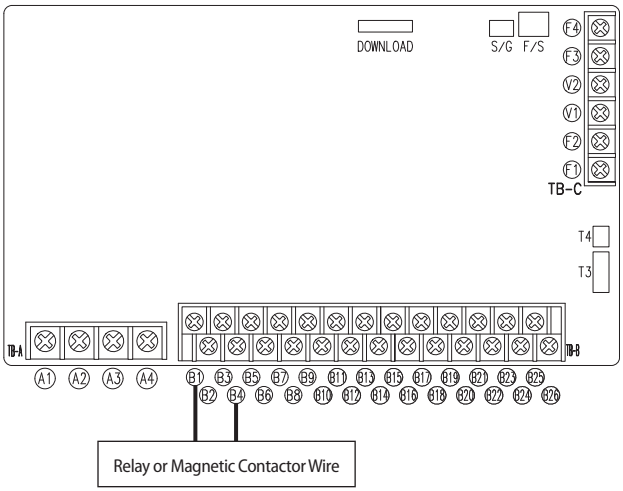
This port can NOT supply enough power for driving a backup heater.
It's just for providing a ON/OFF control signal.
Maximum current is 0.5A.

Specification table

Part	Specification
Terminal Block (output)	Step1 : B1, B2 of TB-B Step2 : B1, B3 of TB-B
Connection load	Relay or Magnetic contactor for a control signal
Output (B1,B2 or [B1,B2]+[B1,B3])	AC 230V (MAX 0.5A)

Wiring works

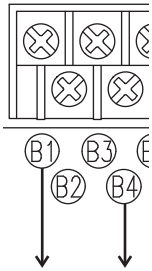
Backup boiler



Connecting a relay or a magnetic contactor for a backup boiler (Not Directly connect a backup boiler)

1. Connect a 'relay or a magnetic contactor' with 'B1, B4' in TB-B.

▶ When a backup heater mode is "ON", a control signal of AC230V goes through B1 and B4.



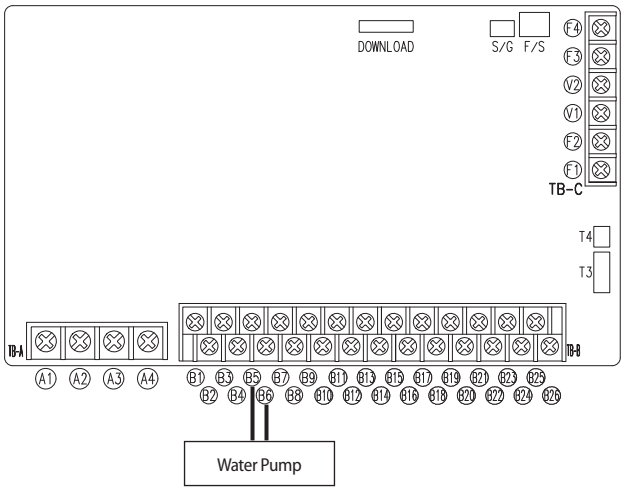
NOTE

This port can NOT supply enough power for driving a backup boiler.
It's just for providing a ON/OFF control signal.
Maximum current is 0.5A.

Specification table

Part	Specification
Terminal Block (output)	B1, B4 of TB-B
Connection load	Relay or Magnetic contactor for a control signal
Output (B1, B4)	AC 230V (MAX 0.5A)

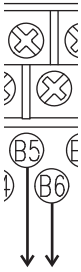
Water pump



Connecting a water pump

1. Directly connect a 'Water Pump' with 'B5, B6' in TB-B.

► AC230V goes through B5 and B6 to turn a water pump on.



NOTE

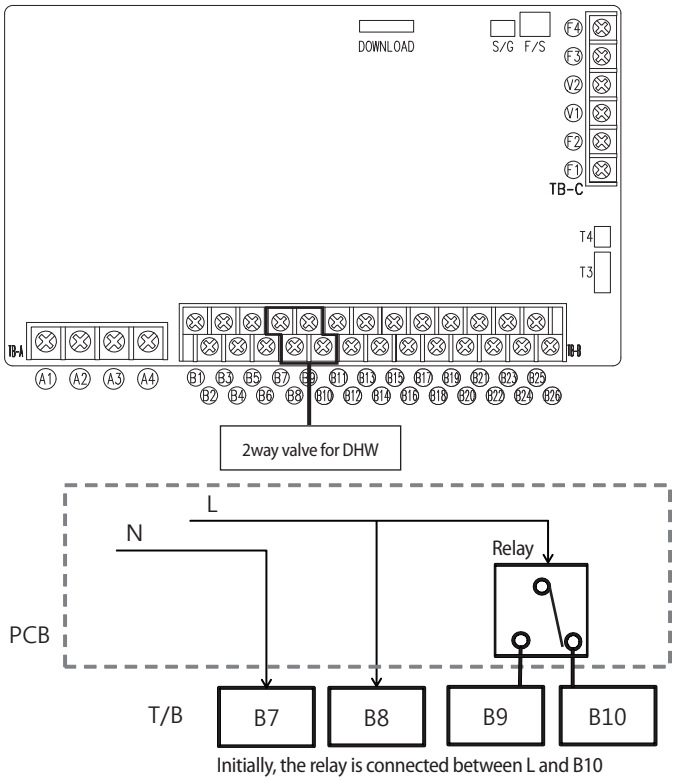
This port can supply power for small-medium sized water pump.
Maximum current is 2A.

Specification table

Part	Specification
Terminal block (output)	B5, B6
Connection load	Water pump (under 2A)
Output (B5, B6)	AC 230V (MAX 2A)

Wiring works

2way valve for DHW



Connecting a 2way valve for DHW

1. Directly connect a '2way valve for DHW' with 'B7, B8, B9 and B10' in TB-B.

NOTE
This port can supply power for small-medium sized valve.
Maximum current is 0.5A

Specification table

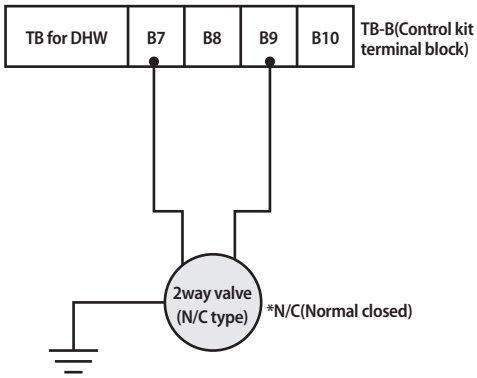
Part	Specification
Terminal block (Output)	B7 : Output Power N B8 : Output Power L B9 : Output Power L (switched) B10 : Output Power L (switched)
Connection load	Direct connect 2way valves (under 0.5A)
Output (B7~B10)	AC 230V (MAX 0.5A / 120W)

Wiring a 2way valve for DHW

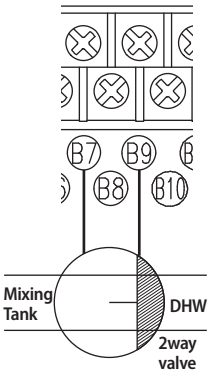
1. Using the appropriate cable, connect a valve control cable to the TB-B

▶ Initial status of the valve for DHW has to be **closed. (no flow)**

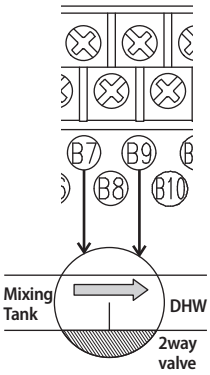
❊ In case of normal closed type



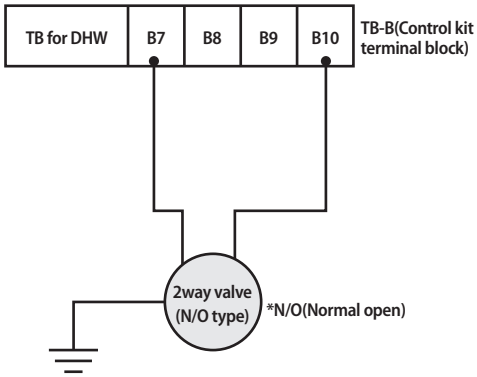
▶ When it is closed



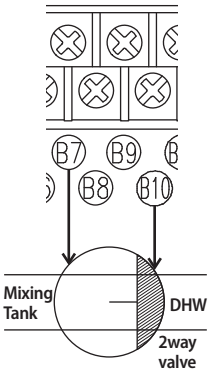
▶ When it is opened



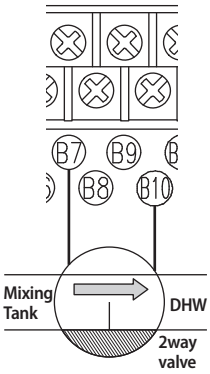
❊ In case of normal opened type



▶ When it is closed



▶ When it is opened



WARNING

- Wiring is different for a N/C(normal closed) valve and a N/O(normal open) valve.

2. Fix the cables with cable ties to the cable tie mountings to ensure strain relief.

ENGLISH

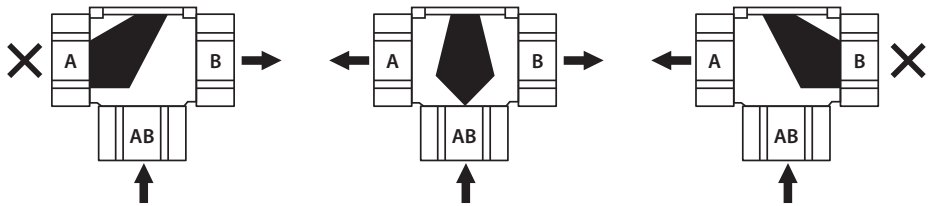
Wiring works

Wiring a 3way valve

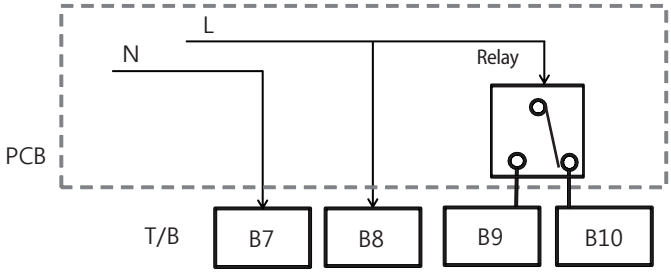
1. Using the appropriate cable, connect the valve control cable to the TB-B

▶ Initial status of a valve for DHW has to be **closed.(no flow)**

Below is case which control kit can support.



▶ Please check 3way valve type, then wire it properly to below blocks of the control kit.

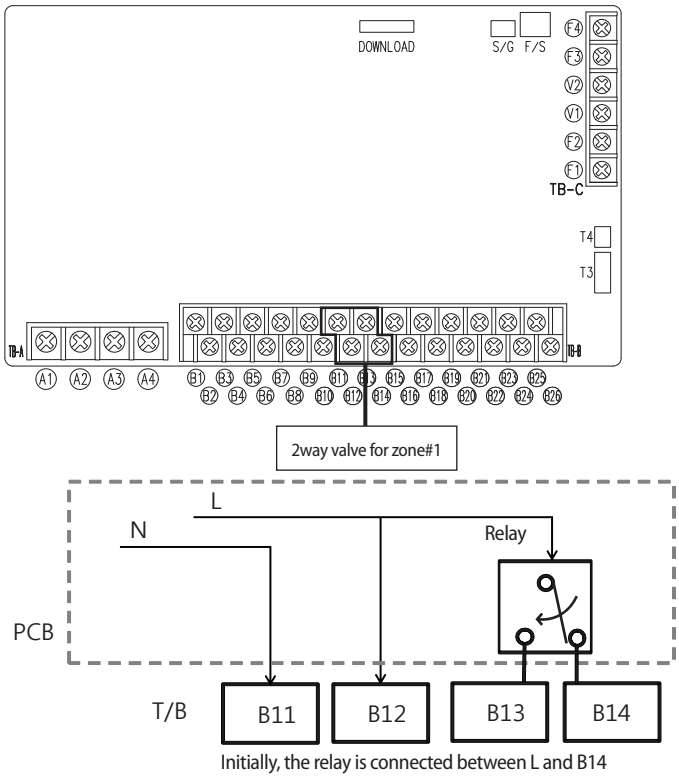


Initially, the relay is connected between L and B10

WARNING

• Before completing installation of 3 way valve, check the direction of the opened port.

2way valve for zone#1



Connecting a 2way valve for zone#1

1. Directly connect a '2way valve for zone#1' with 'B11, B12, B13 and B14 ' in TB-B.

NOTE
This port can supply power for small-medium sized valve.
Maximum current is 0.5A

Specification table

Part	Specification
Terminal block (Output)	B11 : Output Power N B12 : Output Power L B13 : Output Power L (switched) B14 : Output Power L (switched)
Connection load	Direct connect 2way valves (under 0.5A)
Output (B11~B14)	AC 230V (MAX 0.5A / 120W)

Wiring works

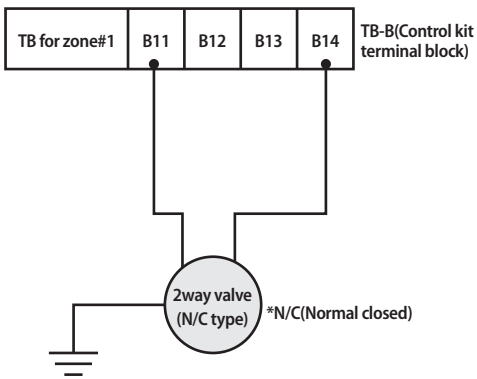
Wiring a 2way valve for zone#1

NOTE
- When outlet water temperature reach to lower than 16°C in cooling mode, Zone#1 2way valve is closed.

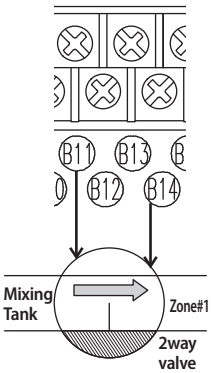
1. Using the appropriate cable, connect a valve control cable to the TB-B

▶ Initial status of a valve for zone#1 has to be **opened.(flow)**

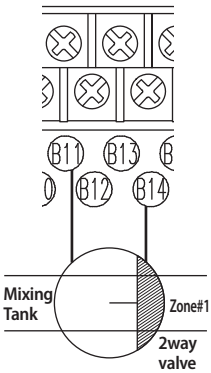
❊ In case of normal closed type



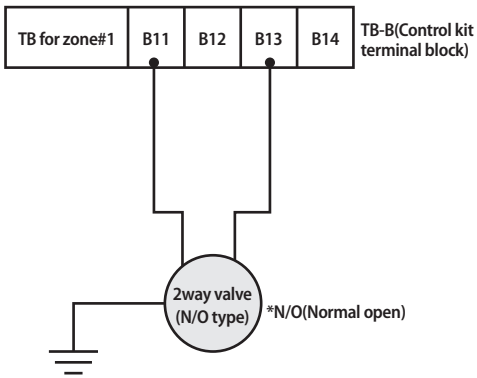
▶ When it is opened



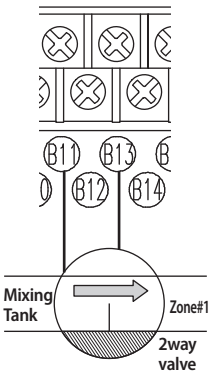
▶ When it is closed



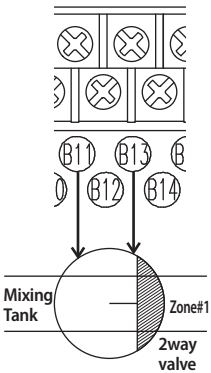
❊ In case of normal opened type



▶ When it is opened



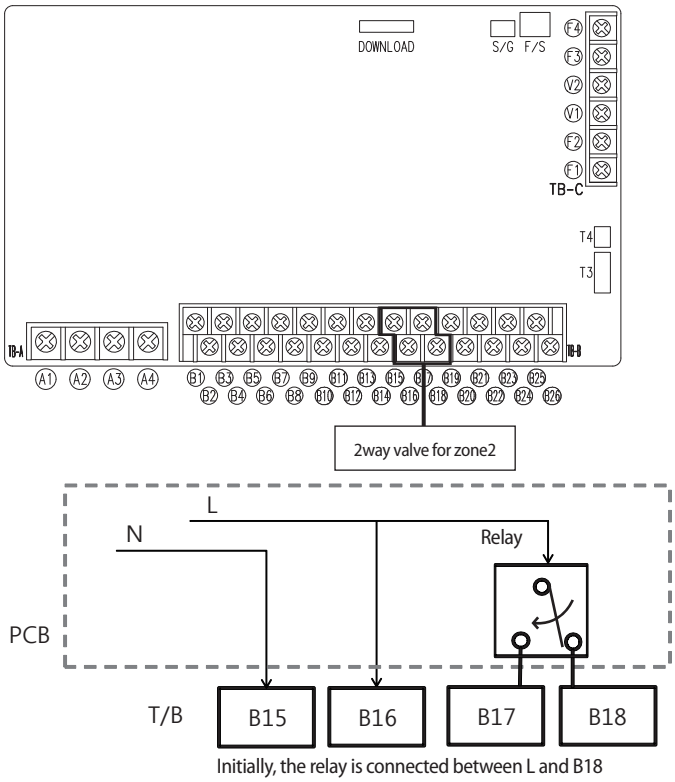
▶ When it is closed



WARNING
- Wiring is different for a N/C(normal closed) valve and a N/O(normal open) valve.

2. Fix the cables with cable ties to the cable tie mountings to ensure strain relief.

2way valve for zone#2



Initially, the relay is connected between L and B18

Connecting a 2way valve for zone#2

1. Directly connect a '2way valve for zone#2' with 'pin B15, B16, B17 and B18' in TB-B.

NOTE This port can supply power for small-medium sized valve.
Maximum current is 0.5A

Specification table

Part	Specification
Terminal block (Output)	B15 : Output power N B16 : Output Power L B17 : Output Power L (switched) B18 : Output Power L (switched)
Connection load	Direct connect 2way valves (under 0.5A)
Output (B15~B18)	AC 230V (MAX 0.5A / 120W)

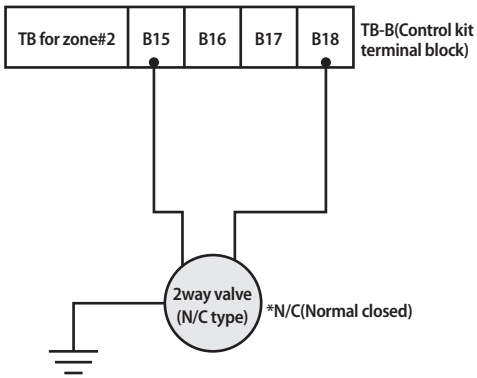
Wiring works

Wiring a 2way valve for zone#2

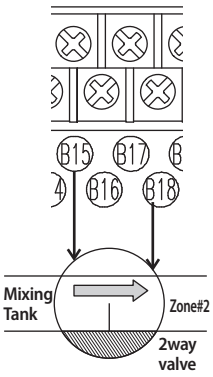
1. Using the appropriate cable, connect a valve control cable to the TB-B

▶ Initial status of a valve for zone#2 has to be **opened.(flow)**

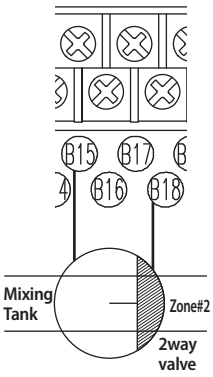
❊ In case of normal closed type



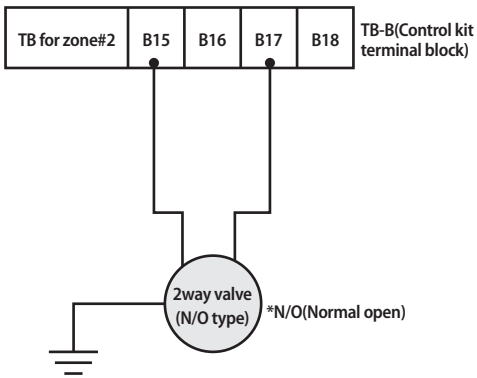
▶ When it is opened



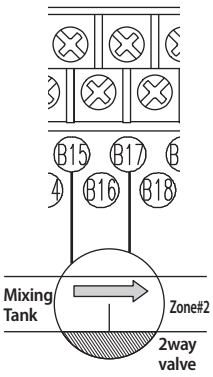
▶ When it is closed



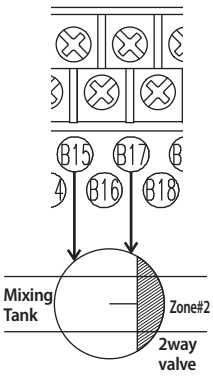
❊ In case of normal opened type



▶ When it is opened



▶ When it is closed

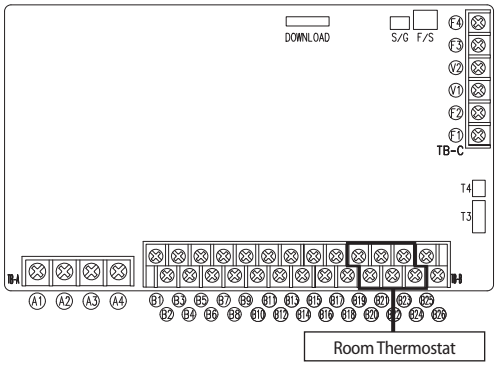


WARNING

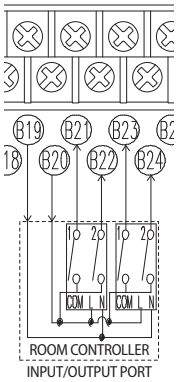
- Wiring is different for a N/C(normal closed) valve and a N/O(normal open) valve.

2. Fix the cables with cable ties to the cable tie mountings to ensure strain relief.

Room thermostat



❊ Wiring example



Connecting a room thermostat (On/Off Controller)

1. Connect a 'Room thermostat' with 'B19, B20, B21, B22, B23 and B24' in TB-B.

NOTE **Maximum Consumption Power**
Each port use under 10mA

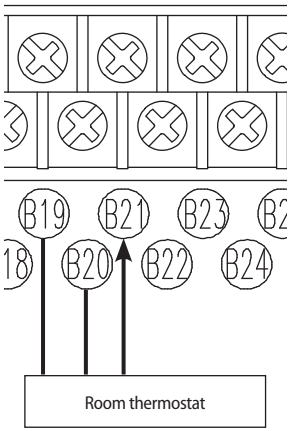
Specification table

Part	Specification
Terminal block (output)	B19 : Output Power N (power supplying port for Thermostat) B20 : Output Power L (power supplying port for Thermostat)
Terminal block (input)	B21 : Detecting switched L line for cooling mode for zone1 B22 : Detecting switched L line for heating mode for zone1 B23 : Detecting switched L line for cooling mode for zone2 B24 : Detecting switched L line for heating mode for zone2
Connection load	Connect Room On/Off Controller
Output (B19, B20)	AC230V (Max 0.5A)
Input (B21, B22, B23, B24)	AC230V L line (Max 10mA)
Condition for operation	B21 detects L line → cooling mode at zone#1 B22 detects L line → heating mode at zone#1 B23 detects L line → cooling mode at zone#2 B24 detects L line → heating mode at zone#2

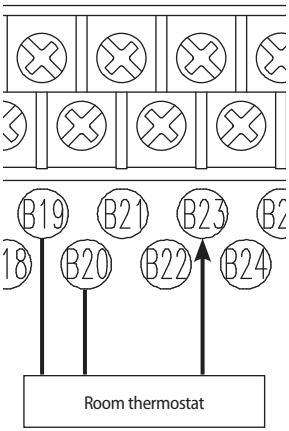
Wiring works

Example

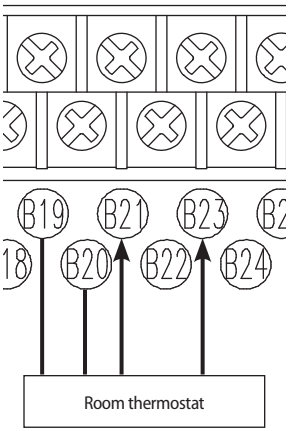
zone#1 only : cooling mode



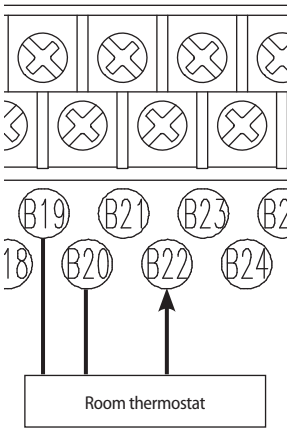
zone#2 only : cooling mode



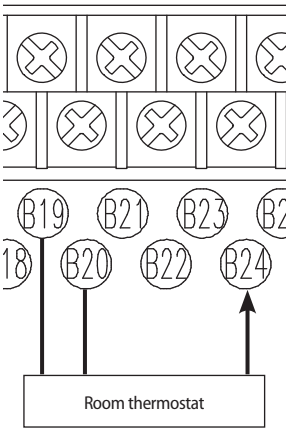
zone#1, zone#2 : cooling mode



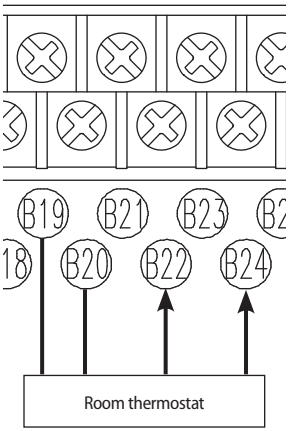
zone#1 only : heating mode



zone#2 only : heating mode



zone#1, zone#2 : heating mode



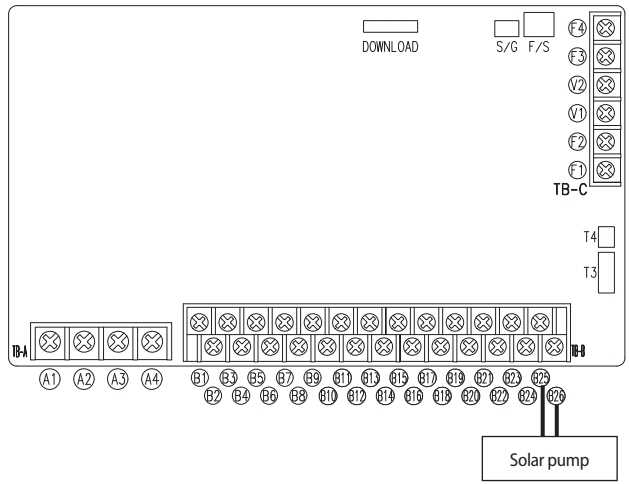
WARNING

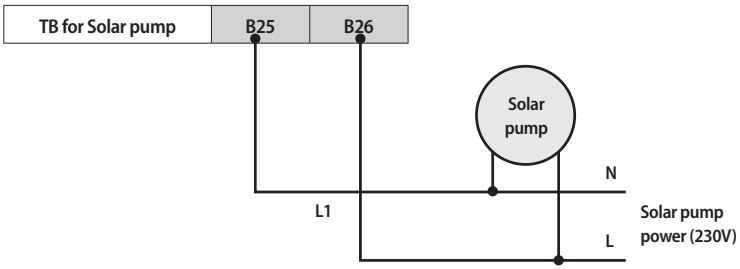
- Before completing installation of Room thermostat, check the wiring method in a manual of Room thermostat to output L line.

Target zone	Zone 1
Thermostat on/off controller's output signal	Only Heat

▶ Connect a thermostat on/off controller's power to B19, B20 and connect output of a thermostat on/off controller to B22.

Solar Pump





Connecting solar pump

1. Connect a 'Solar pump power line' with 'B25, B26 ' in TB-B.

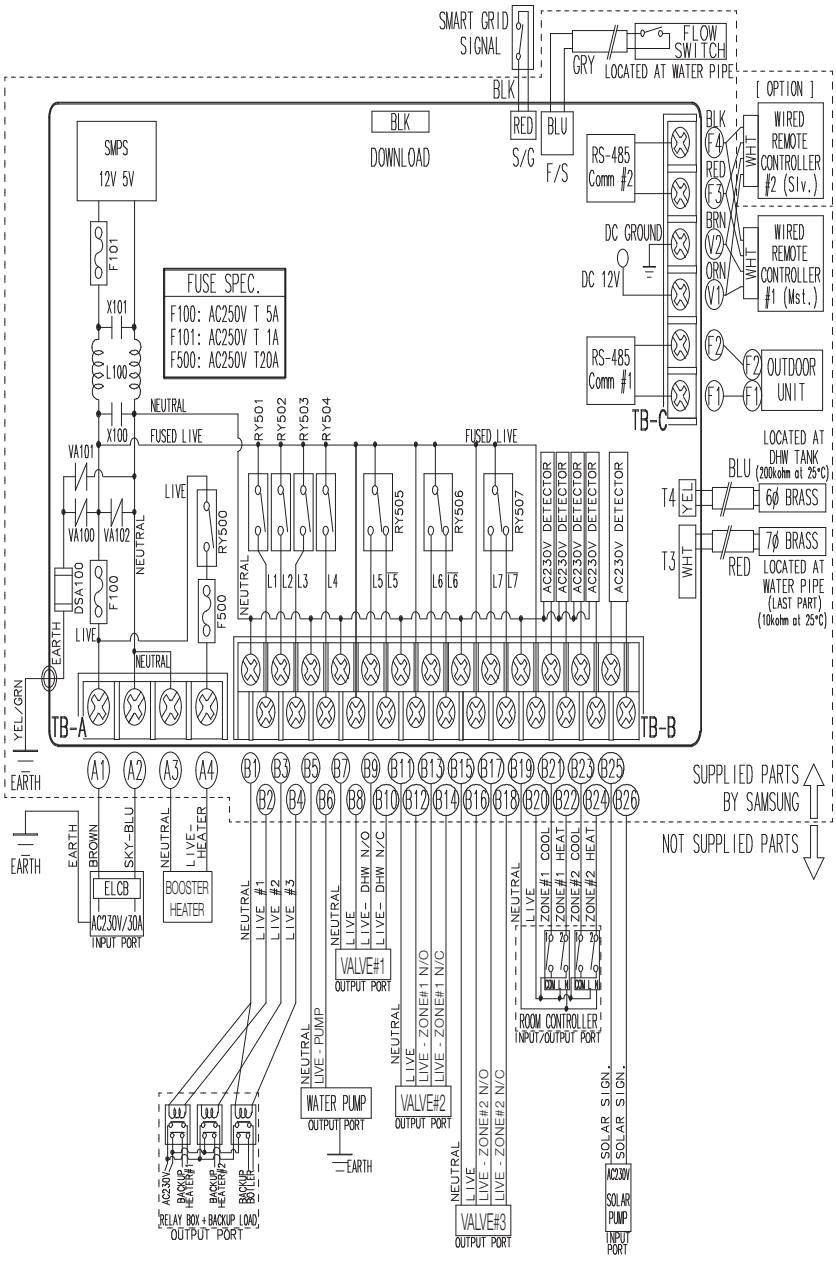
NOTE **Maximum Consumption Power**
- Each port use under 10mA
- B25, B26 ports are an input port for detection and they do NOT supply power to a solar pump.

Specification table

Part	Specification
Terminal block (input)	B25 : input for detection Power N B26 : input for detection Power L
Connection load	Direct connect from solar pump (AC230V)
Input (B25~B26)	AC 230V (MAX 10mA)

Wiring schematics

Wiring diagram



Setting option switches and function of keys

Field setting mode

Field Setting Value(FSV) Table

NOTE

- Reset the power after changing the Field Setting Value.

- Code 10✳✳ : Upper and lower temperature limits of each operation mode of wired remote controller Heating(Water Out, Room), Cooling(Water Out, Room), DHW(Tank)
- Code 20✳✳ : Water law design and external room thermostat Heating(2 WL's for floor & FCU), Cooling(2 WL's for floor & FCU), WL & Thermostat types

Field Setting Value								
Main Menu & Code	Sub Menu Function	Description	Sub Code	Default	Min	Max	Step	Unit
Remote Controller Setting Range Code 10✳✳	Water Out Temp for Cooling	Max	✳✳11	25	18	25	1	˚C
		Min	✳✳12	16	5	18	1	˚C
	Room Temp for Cooling	Max	✳✳21	30	24	30	1	˚C
		Min	✳✳22	18	18	22	1	˚C
	Water Out Temp for Heating	Max	✳✳31	55	37	55	1	˚C
		Min	✳✳32	25	15	37	1	˚C
	Room Temp for heating	Max	✳✳41	30	24	30	1	˚C
		Min	✳✳42	16	16	22	1	˚C
	DHW Tank Temp	Max	✳✳51	50	50	70	1	˚C
		Min	✳✳52	40	30	40	1	˚C
Water Law Code 20✳✳	Outdoor Temp for Water Law (Heating)	Point ①	✳✳11	-10	-20	5	1	˚C
		Point ②	✳✳12	15	10	20	1	˚C
	Water Out Temp for WL1 Heating (WL1-Floor)	Point ①	✳✳21	40	40	55	1	˚C
		Point ②	✳✳22	25	17	37	1	˚C
	Water Out Temp for WL2 Heating (WL2-Fan Coil Unit)	Point ①	✳✳31	50	40	55	1	˚C
		Point ②	✳✳32	35	17	37	1	˚C
	Heating Water Law for Auto Mode	WL Type	✳✳41	1(WL1)	1	2(WL2)	-	-
	Outdoor Temp for Water Law (Cooling)	Point ①	✳✳51	30	25	35	1	˚C
		Point ②	✳✳52	40	35	45	1	˚C
	Water Out Temp for WL1 Cooling (WL1-Floor)	Point ①	✳✳61	25	18	25	1	˚C
		Point ②	✳✳62	18	5	18	1	˚C
	Water Out Temp for WL2 Cooling (WL2-Fan Coil Unit)	Point ①	✳✳71	18	18	25	1	˚C
		Point ②	✳✳72	5	5	18	1	˚C
	Cooling Water Law	WL Type	✳✳81	1(WL1)	1	2(WL2)	-	-
	External Thermostat Application	#1(Floor)	✳✳91	0(No)	0	1(Yes)	-	-
		#2(FCU)	✳✳92	0(No)	0	1(Yes)	-	-

Setting option switches and function of keys

- Code 30✳✳ : User's options for domestic hot water(DHW) tank heating
  - 3011 : Application of DHW tank in user's system
  - 302✳ : Heat pump variables for tank temp. control and combination with booster heater
  - 303✳ : Booster heater variables for combination with heat pump
  - 304✳ : Periodical disinfection heating of water tank
  - 305✳ : Off timer for power DHW mode by hot key of wired remote controller
  - 3061 : Combination of external field solar panel for with heat pump for DHW heating
  - 307✳ : Default direction of the DHW valve or Zone #1, #2 valve
    When the 3way valve is applied to DHW Valve terminal block instead of 2way valve, default direction is Space Heating (Room)

Field Setting Value								
Main Menu & Code	**Sub Menu Function**	**Description**	**Sub Code**	**Default**	**Min**	**Max**	**Step**	**Unit**
DHW Code 30✳✳	Domestic Hot Water Tank	Application	✳✳11	0(No)	0	1(Yes)	-	-
	Heat Pump	Max Temp	✳✳21	50	45	55	1	˚C
		Stop	✳✳22	2	2	10	1	˚C
		Start	✳✳23	5	1	20	1	˚C
		Min Operation	✳✳24	5	0	20	1	min
		Max Operation	✳✳25	30	5	95	5	min
		Interval	✳✳26	3	0	10	0.5	hour
	Booster Heater	Application	✳✳31	1(On)	0(OFF)	1	-	-
		Delay Time	✳✳32	20	20	95	5	min
		Overshoot	✳✳33	0	0	4	1	˚C
		Compensation Temp	✳✳34	10	0	20	1	˚C
	Disinfection	Application	✳✳41	1(On)	0(OFF)	1	-	-
		Interval	✳✳42	Fri	Mon	Sun	1(All)	day
		Start Time	✳✳43	23	0	23	1	o'clock
		Target Temp	✳✳44	70	40	70	5	˚C
		Duration	✳✳45	10	5	60	5	min
	Power DHW by User Input	Timer OFF Function	✳✳51	0(Off)	0	1(On)	-	-
		Timer Duration	✳✳52	60	30	300	10	min
	Solar Panel	H/P Combination	✳✳61	0	0	1(Yes)	-	-
	Direction of 2Way valve	DHW valve	✳✳71	0(Close)	0	1(Open)	-	-

- Code 40✳✳ : User's options for heating devices including internal backup heater and external boiler
  - 401✳ : Space/DHW heating priority and control variables
  - 402✳ : Backup/Booster heater priority and control variables
  - 403✳ : Additional backup boiler operating variables
- Code 50✳✳ : User's options for extra functions
  - 501✳ : New target temperatures of each mode by "Outgoing" hot key of remote controller
  - 5021 : Temperature difference between before & after values in "Economic" DHW mode
  - 504✳ : Power Peak control for Smart Grid

Field Setting Value								
Main Menu & Code	**Sub Menu Function**	**Description**	**Sub Code**	**Default**	**Min**	**Max**	**Step**	**Unit**
Heating Code 40✳✳	Heat Pump	Heating/DHW Priority	✳✳11	0(DHW)	0	1(Heating)	-	-
		Outdoor Temp for Priority	✳✳12	0	-15	20	1	˚C
		Heating Off	✳✳13	25	14	35	1	˚C
		Overshoot	✳✳14	2	1	4	1	˚C
	Backup Heater	Application	✳✳21	1(On)	0(Off)	1	-	-
		BUH/BSH Priority	✳✳22	0(Both)	0	2(BSH)	1	-
		Cold weather compensation	✳✳23	1(On)	0(Off)	1	-	-
		Threshold Temp	✳✳24	0	-15	35	1	˚C
	Backup Boiler	Application	✳✳31	0(No)	0	1(Yes)	-	-
		Boiler Priority	✳✳32	0(Off)	0	1(On)	-	-
		Threshold Temp	✳✳33	-15	-20	5	1	˚C
Others Code 50✳✳	Outing	Water Out Temp for Cooling	✳✳11	25	5	25	1	˚C
		Room Temp for Cooling	✳✳12	30	18	30	1	˚C
		Water Out Temp for Heating	✳✳13	25	15	55	1	˚C
		Room Temp for Heating	✳✳14	16	16	30	1	˚C
		Auto Cooling WL1 Temp	✳✳15	25	5	25	1	˚C
		Auto Cooling WL2 Temp	✳✳16	25	5	25	1	˚C
		Auto Heating WL1 Temp	✳✳17	15	15	55	1	˚C
		Auto Heating WL2 Temp	✳✳18	15	15	55	1	˚C
		Target Tank Temp	✳✳19	30	30	70	1	˚C
	DHW Saving Mode	Temp Difference	✳✳21	5	0	40	1	˚C
	Power Peak Control	Application	✳✳41	0(No)	0	1(Yes)	-	-
		Select forced off parts	✳✳42	1	0	2	-	-
		Using input voltage	✳✳43	1(High)	0(Low)	1	-	-

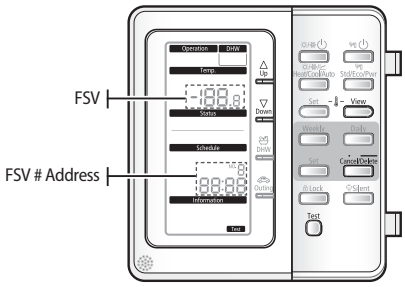
- Code 5042

[D-00]	Compressor	Back up heater	Booster heater
0 (Default)	Forced off	Forced off	Forced off
1	Forced off	Forced off	Permitted
2	Permitted	Forced off	Forced off

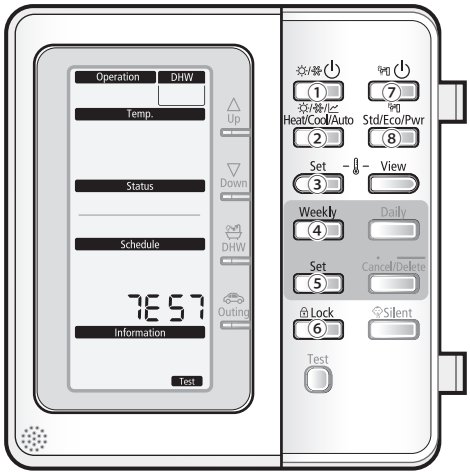
Setting option switches and function of keys

Field setting view mode

1. Enter and quit Field Setting View Mode
   - Press "View" and "Test" buttons for 3 seconds.
   - 'Test' icon pops up and display shows FSV address and value.
   - When there is no input of valid buttons for 3 minutes or "Cancel" button is pressed, it goes back to normal mode automatically
2. How to use
   - "Up" : move to the next address
   - "Down" : Move to the previous address
   - "Cancel" : Back to the normal mode
   - "Not available" icon blinks when the invalid buttons are pressed.



Self test mode



Set Test		(3sec) Enter Self Test Mode	TEST
Cancel/Delete		Function OFF / (3sec) Quit Self Test Mode	-
①		Water Pump	
②	Heat/Cool/Auto	Back up Heater 1st state	
③	Set	Back up Heater 2st state	
④	Weekly	Booster Heater	
⑤	Set	Back up Boiler	
⑥	Lock	DHW Valve	
⑦		Zone #1 Valve	2-1
⑧	Std/Eco/Pwr	Zone #2 Valve	2-2
View		Show five temp. sensor values in order	IN→ OUT1→ OUT2→
-		Not available	
-		Thermostat (Heating) No.1 / No.2	HEAT/HEAT
-		Thermostat (Cooling) No.1 / No.2	COOL/COOL

1. Self test mode
   - Self Test Mode is implemented ignoring errors.
   - It can be implemented without OUTDOOR UNIT installation.
   - Buttons have new functions as shown in the upper table under the Self Test Mode
2. Enter and quit Self test mode

▶ To enter Self test mode
   - Set DIP #5 (wired remote controller) "ON" and reset power.
   - Press both "Set" and "Test" buttons over 3 sec.
   - 'TEST' icon and sign pop up.

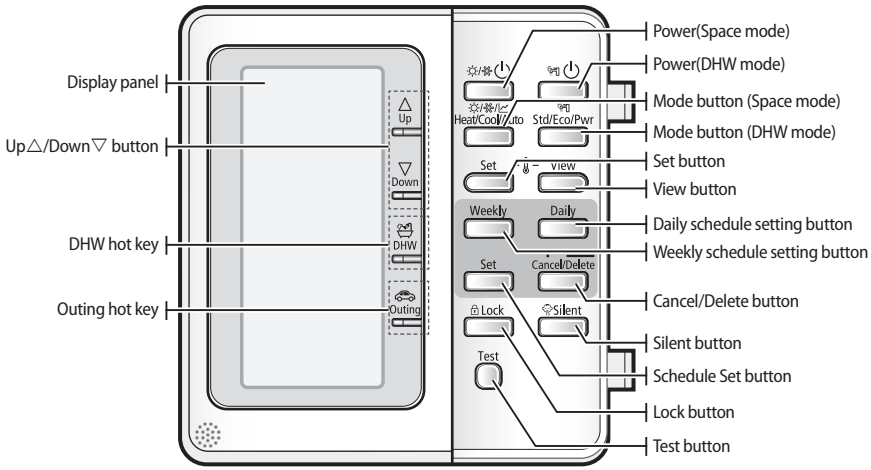
▶ To quit the self test mode
   - Press "Cancel " button over 3 sec.

3. How to use
   - 'Not available' icon pops up when the buttons not shown in the upper table are pressed.
   - All the functions' default states are "OFF"
   - Pressing the button (#1~#8) makes its function "ON" and Cancel button makes all the functions "OFF"
   - Back up Heater 1(button#2) and 2(button#3) are not available when the Water Pump (button #1) is not "ON"
   - Every time you press the View button, it shows temperature sensor values in order. PHE water inlet → PHE water outlet → Backup Heater outlet → Water Tank → Room. It goes back to the previous state when there is no View button input for 5 sec.
   - 'HEAT' or 'COOL' sign and thermostat icon pop up instead of 'TEST' sign when the thermostat is connected.

Before running the system

Make sure to confirm if refrigerant leakage, looseness of power cords and electric wires after completing installation of kit and heat pump systems.

Wired remote controller



Troubleshooting

The following table shows useful technical information for diagnosing and making error correction for various troubles which may occur in the system. Before contacting your local installers, read this page carefully and implement visual inspections of the whole system.

Possible causes	Actions
Heating or cooling performance are not good	• Check the temperature adjustment in the controller • Check if the water is filled in the system fully • Check the water flow rate
Loud noise from water pump	• Check air purge valve (Make it open and close) • Check if the water is filled in the system fully • Check if strainer is full of foreign materials
System does not work even power source does not have problem	• Check if wiring connections are installed well • Check if water flow rate is low (system will not work in condition of below 16 LPM)
Solar pump is not working	• Check TB-B and wire connections
Remote controller cannot be set	• Check if it has the mode of master or slave • If there are 2 controllers, either one shall have slave mode.

CAUTION

- Always make sure to turn off the system before implementing the visual checking or disassemble for detail checks.

WARNING

- Incorrect handling of thermostat, safety valve or other valves may lead to tank rupture. When servicing the unit follow instructions carefully:
  - Always turn off main power supply when water supply is being shut off.
  - Test the free operation of the safety valve regularly by opening the valve ensuring the water flows freely.
  - Electrical connection and all servicing of the electrical components should only be carried out by an authorized electrician.
  - Fitting and all servicing of plumbing fixtures should only be carried out by an authorized installer.
  - When replacing the thermostat, safety valve or any other valve or part supplied with this unit, use only approved parts of the same specification.

Error codes

If the unit has some problems and does not work normally, error code is shown on the OUTDOOR UNIT main PBA or LCD of the wired remote controller.

Display	Explanation
101	CONTROL KIT / OUTDOOR UNIT wire connection error
102	CONTROL KIT / OUTDOOR UNIT communication time out error
162	EEPROM Error
201	CONTROL KIT/OUTDOOR UNIT communication error (Matching error)
202	CONTROL KIT/OUTDOOR UNIT communication error (3 min)
203	Communication error between INVERTER and MAIN MICOM (6 min)
221	OUTDOOR UNIT temperature sensor error
231	condenser temperature sensor error
251	Discharge temperature sensor error
320	OLP sensor error

Display	Explanation
403	Detection of OUTDOOR UNIT compressor freezing (During cooling operation)
404	Protection of OUTDOOR UNIT when it is overload (during Safety Start, Normal operation state)
416	Discharge of a compressor is overheated
419	OUTDOOR UNIT EEV operation error
425	Power source line missing error (only for 3-phase model)
440	Heating operation blocked (outdoor temperature over 35℃)
441	Cooling operation blocked (outdoor temperature under 9℃)
458	OUTDOOR UNIT fan1 error
461	[Inverter] Compressor startup error
462	[Inverter] Total current error/PFC over current error
463	OLP is overheated
464	[Inverter] IPM over current error
465	Compressor V limit error
466	DC LINK over/low voltage error
467	[Inverter] Compressor rotation error
468	[Inverter] Current sensor error
469	[Inverter] DC LINK voltage sensor error
470	EEPROM read/write error
471	[Inverter] OTP error
474	IPM(IGBT Module) or PFCM temperature sensor Error
475	OUTDOOR UNIT fan2 error
484	PFC Overload Error
485	Input current sensor error
500	IPM is overheated
554	Gas leak error
601	Communication error between the CONTROL KIT and wired remote controller
602	Wired remote controller Master/Slave setting error
604	Communication tracking error between the CONTROL KIT and wired remote controller
607	Communication error between the Master and Salve wired remote controllers
901	Water inlet (PHE) temperature sensor error(open/short)
902	Water outlet (PHE) temperature sensor error(open/short)
903	Water outlet (backup heater) temperature sensor error.
904	DHW tank temperature sensor error
906	Refrigerant gas inlet (PHE) temperature sensor (open/short)
911	Flow switch and water pump error (F/S signal is OFF for 10 sec. during the water pump signal is ON)
912	Flow switch and water pump error (Water pump signal is OFF for 60sec during the F/S signal is ON)