



**MONOBLOCK HYDRONIC 3IN1  
AIR TO WATER HEAT PUMP  
Space Heating, Cooling & Hot Water  
OWNER'S MANUAL**

**MACHRW020ZA/P(01)  
MACHRW020ZA/P(E01)  
MACHRW030ZA/P(01)  
MACHRW030ZA/P(E01)**

**AIR TO WATER  
MULTIFUNCTION HEAT PUMP**



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# Notice

**1.1 Save this manual for future reference.**

**1.2 In order to use this product better and more safely, please read this manual carefully before installation and initial operation.**

**1.3 Children or persons with physical, sensory or mental disability should not play with nor operate this appliance.**

**1.4 This appliance must be installed by qualified and experienced technicians/tradespeople. Improper installation of this appliance may cause damage and danger.**

**1.5 This appliance must be installed in accordance with Australian wiring regulations including an isolating switch from the supply mains and grounded power supply consistent with the power requirements of this appliance.**

**1.6 The installation of this appliance must comply with the model's wiring chart in this manual and its power requirements as stated on the rating label on the side of the heat pump.**

**1.7 Do not install this appliance close to flammable or explosive materials, or naked flames.**

**1.8 A filter in the mains water supply inlet is recommended and should be checked/cleaned periodically.**

**1.9 Checking and cleaning of the evaporator fin coil is recommended for good air flow.**

**1.10 The battery should be removed from this appliance's controller at the end of its operating life and disposed of safely.**

# I. Specification

## 1、Model Nomenclature

Source medium	MA	CHR	W	S	***	WA	/	PS	(B 01 D)	
MA: Air source										D: With electrical heating (Without electrical heating omitted)
MW: Ground source										01: One plate heat exchanger 02: Two plate heat exchangers
MD: Double source										B: DC Inverter E: EVI (Without inverter or EVI omitted)
Function of the unit										S: 3phase (single phase omitted)
C: Air cooling										P: With built in pump (Without built in pump omitted)
R: Air heating										
CH: Air cooling and hot water										
CR: Air cooling and heating										
CHR: Air (heating+cooling) and hot water										
Energy exchange medium										A: Horizontal fan direction B: Upward fan direction (Omit the split type unit model)
A: Refrigerant										
W: Water										
S: with solar (Without solar omitted)										
The figure represents the horse power of unit eg: 010 means 1 horse power										Z: Integrated type W: Split type (indoor unit)

## 2. Parameter of multi-function air to water heat pump

Model	MACHRW020ZA/P(01)	MACHRW030ZA/P(01)
Sizing Guide for 6 star home (m2)*	100	135
Rated Cooling Capacity (kW) ①	5.0	7.5
Rated Input Power (kW) ①	1.75	2.6
Rated Input Current (A) ①	8	12
Performance COP (W/W) ①	2.9	2.9
Rated Heating Capacity (kW) ②	5.5	8.3
Rated Input Power (kW) ②	1.69	2.55
Rated Input Current (A) ②	7.7	11.6
Performance COP (W/W) ②	3.26	3.26
Rated Heating Capacity (kW) ③	5.4	8.2
Rated Input Power (kW) ③	2.5	3.6
Rated Input Current (A) ③	11.1	16.5
Performance COP (W/W) ③	2.2	2.25
Power Supply (V/Ph/Hz)	220-240/1/50	220-240/1/50
Max water output temp (°C)	60	60
Sound level (dBa)	48	52
Compressor type	Rotary	Scroll
Compressor Qty	1	1
Water inlet/outlet pipe diam. (inch)	1"	1"
Water Flow Volume (litres/min)	17	23
Refrigerant type	R410a	R410a
Net Dimensions (L/W/H mm)	1010/340/620	1115/440/685
Shipping Dimensions (L/W/H mm)	1095/405/650	1205/525/725
Net Weight (kg)	83	101
Shipping Weight (kg)	88	116
ASSUMPTIONS ① Outdoor air temp 35°C /24°C, Inlet water temp 12°C, Outlet water temp 7°C (Cooling mode) ② Outdoor air temp 7°C /6°C, Inlet water temp 40°C, Outlet water temp 45°C (Heating mode) ③ Outdoor air temp 7°C /6°C, Inlet water temp 55°C, Outlet water temp 60°C (Heating mode) * Using hydronic radiant skirting boards, note under floor heating sizing depends on the floor covering, tiles are more efficient, carpet least efficient.		

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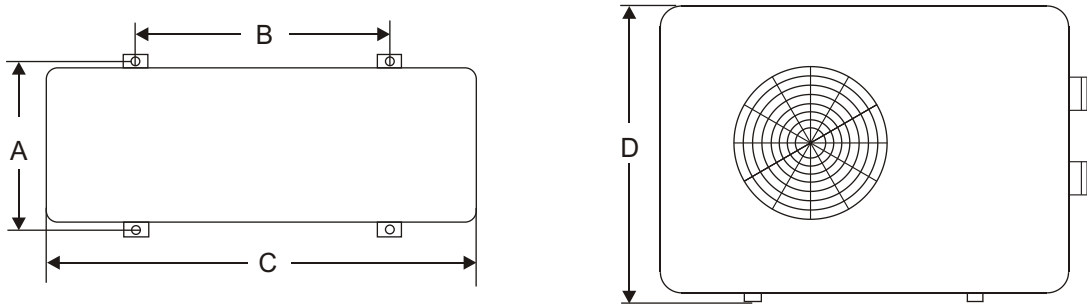
ASSUMPTIONS ① Outdoor air temp 35°C /24°C, Inlet water temp 12°C, Outlet water temp 7°C (Cooling mode)

② Outdoor air temp 7°C /6°C, Inlet water temp 40°C, Outlet water temp 45°C (Heating mode)

③ Outdoor air temp 7°C /6°C, Inlet water temp 55°C, Outlet water temp 60°C (Heating mode)

\* Using hydronic radiant skirting boards, note under floor heating sizing depends on the floor covering, tiles are more efficient, carpet least efficient.

3. Product appearance and installation dimension



Units: mm

<div>MACHRW</div> <div>Size</div>	020ZA/(01)	030ZA/(01)
A	340	440
B	645	750
C	1010	1115
D	620	685

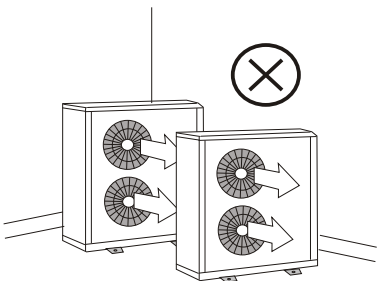
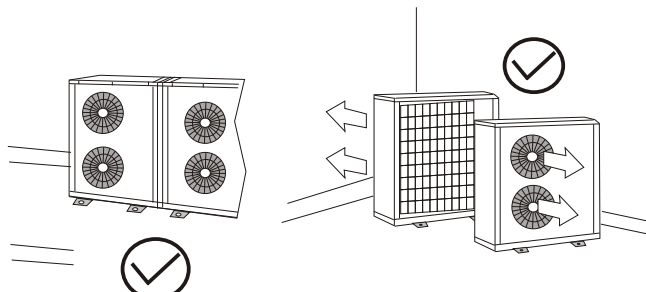
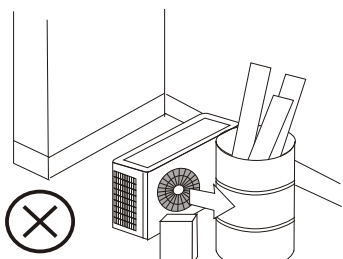
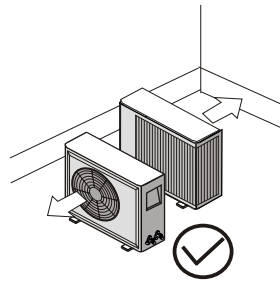
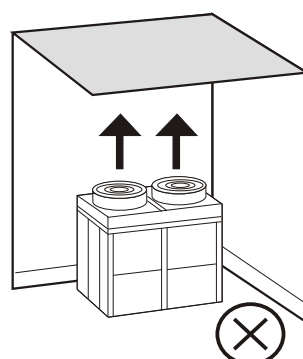
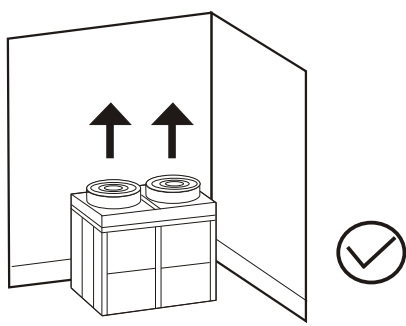
Units: mm

<div>MACHRW</div> <div>Size</div>	020ZA/(E01)	030ZA/(E01)
A	340	440
B	645	750
C	1010	1115
D	620	685

# II. Installation

## 1. Heat Pump Outdoor Unit installation position

Install the heat pump outdoor unit with good air flow both into and out from the unit. Ensure there is sufficient space around the unit for maintenance and good operation, refer to the schematics and points below:

Wrong	Right
	
	
	



Notice:

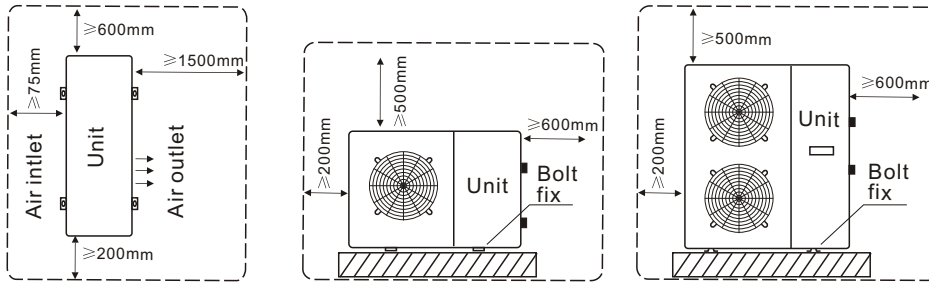
1. To get enough air for ventilation of the unit, the installation position should have good air flow.
2. The position should not reflect noise from the air outlet or transfer vibration.
3. Protection from direct sunlight is advisable.
4. The water from rain and defrosting can be discharged from the installation position.
5. The unit should be protected by an awning from snow in Alpine areas.
6. The discharged air should not blow into prevailing wind.
7. Do not face the air outlet directly at a neighbour's fence.
8. The position should not be affected by garbage, oil or flammable materials.
9. The installation position should not be affected by sea salt spray or sulphides near a thermal spring.



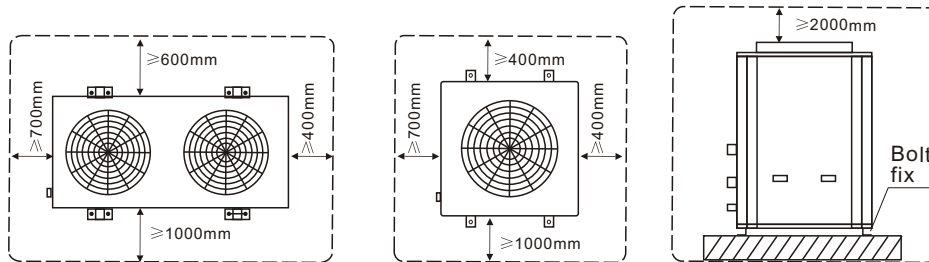
10. The unit can be installed on a balcony, roof or other convenient place if there is a suitable load bearing structure to support its weight.
11. The control panel should not be installed in a bathroom due to high humidity and moisture.
12. Leave enough space around the unit for good operation and servicing.
13. Consider installing rubber pads under the heat pump feet.
14. Use expansion bolts to fix the feet of the outdoor unit to the ground.
15. Ensure the condensate water from the heat pump is taken to a drain.

## 2. Installation requirement

### A. Side fan type installation space requirements:



### B. Top fan type installation space requirements:



## 3. Domestic Hot Water (DHW) Storage Tank and Buffer Tank Installation

3.1. The DHW and Buffer tanks may be installed inside or outside.

3.2. Both tanks must stand vertically on a concrete plinth or firm structure that will support its weight when full of water and not lean or be prone to fall over during its service life.

3.3. The DHW tank should be installed in accordance with Australian Standard AS/NZS3500.4 and any local or other relevant Government regulations. It is best to install the DHW tank as close as possible to the hot water outlet that has the greatest usage, such as the kitchen.

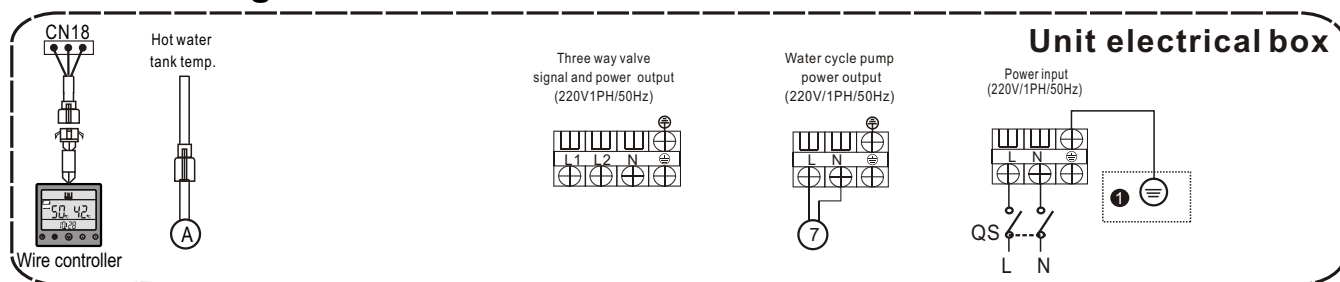
3.4. Some building codes require a seismic restraint. Consider using stainless steel bands to secure the tank against the wall.

3.5. When filling the DHW tank, open the hot water taps in the laundry and kitchen to purge air from the water lines.

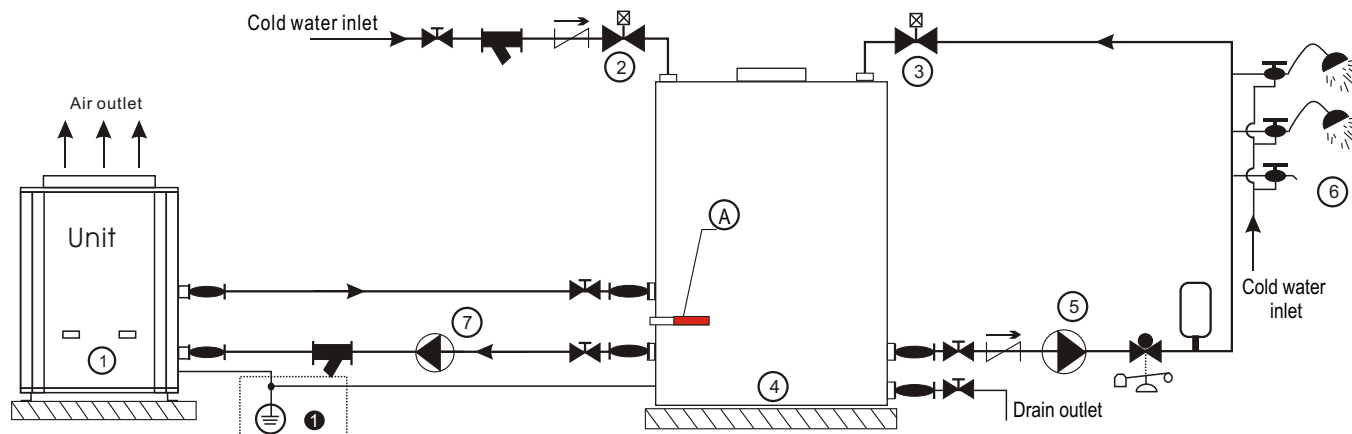
3.6. When filling the Buffer Tank, use pure rain water with mould inhibitor, add Glycol if prone to freezing conditions, and water pH should ideally be at 7.0.

3.7. An expansion tank and bleeder valve must be included in the hydronic closed loop to allow the heated water to expand and air to be easily purged from the system.

## 4. Water heating installation schematic

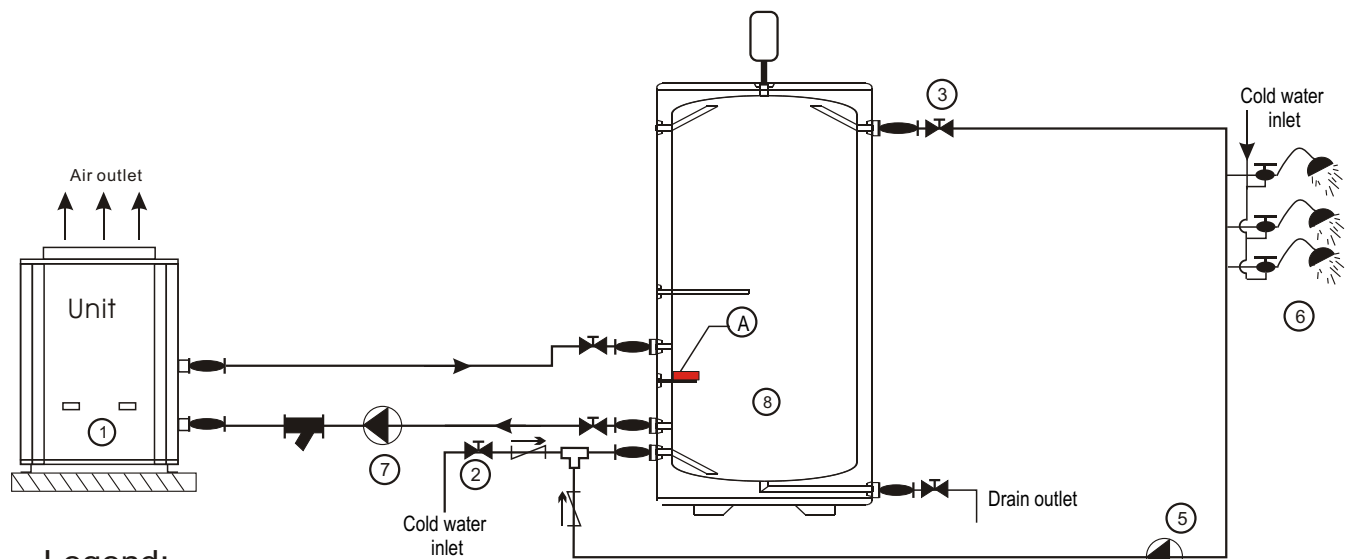


### 4.1 Installation schematic of low pressure tank



Note: ❶ The power lead must be properly earthed in accordance with electrical regulations and Australian Standard AS/NZS3000.

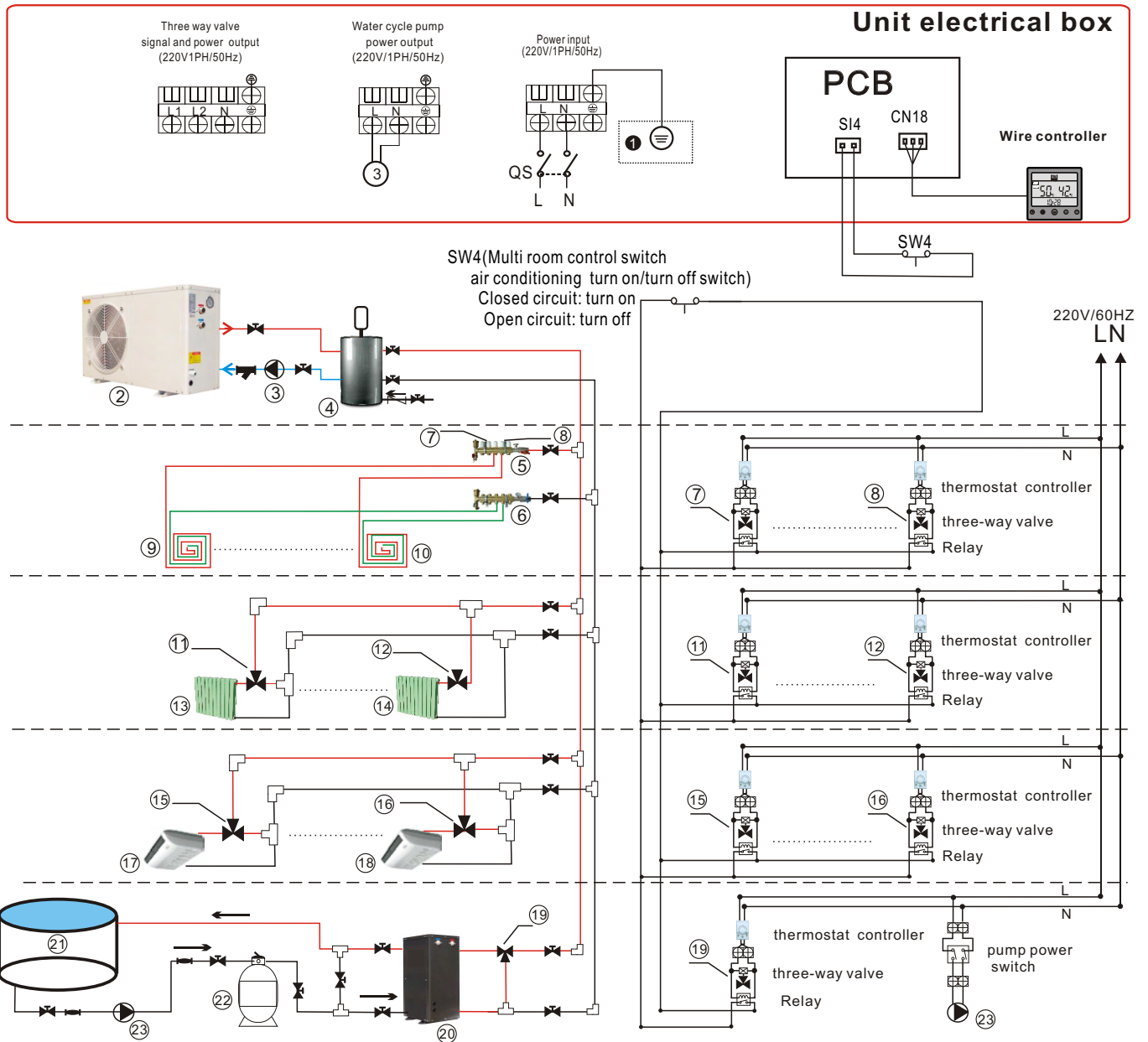
### 4.2 Installation schematic of mains pressure tank



#### Legend:

	Globe valves		Shower head		Hot water cycle pump
	Electric driven two-way valve		Heat Pump Outdoor Unit		Mains pressure storage tank
	Check valve		Cold Water inlet valve		Hot water tank temp.
	Water pressure switch		Domestic hot water supply valve		
	Water temp. sensor		Low pressure storage tank		
	Expansion Tank		Ring main cycle pump		
			Bath room		

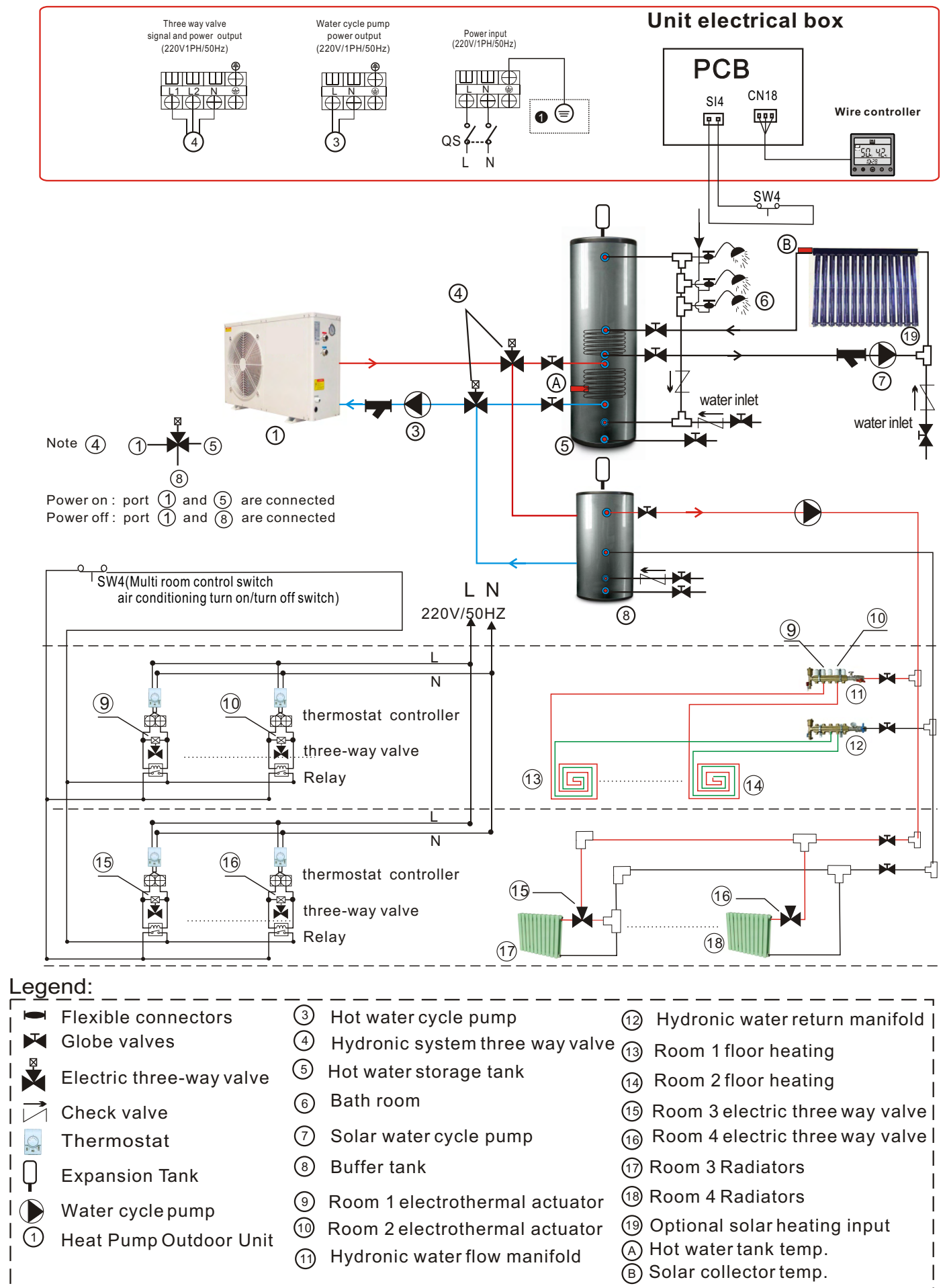
#### 4.3. Heating and cooling mode installation schematic



#### Legend:

	Flexible connectors		Hydronic water return manifold		Room 6 electric three-way valve
	Globe valves		Electric actuator		Room 5 fan coil
	Electric three-way valve		Electric actuator		Room 6 fan coil
	Check valve		Room 1 floor heating		Swimming pool three-way valve
	Thermostat		Room 2 floor heating		Water to water exchange
	Expansion Tank		Room 3 electric three way valve		Swimming pool
	Water cycle pump		Room 4 electric three way valve		Sand cylinder filter
	Heat Pump Outdoor Unit		Room 3 Radiators		Swimming pool side water cycle pump
	Hot water cycle pump		Room 4 Radiators		
	Buffer tank		Room 5 electric three way valve		
	Hydronic water flow manifold				

#### 4.4. Heating and cooling mode plus domestic hot water installation schematic



## **5. Installation of indoor heating and cooling equipment**

5.1 Indoor heating and cooling equipment such as fan coils, radiator heating or floor heating, should be installed in accordance with relevant regulatory requirements including Australian Standard AS/NZS3500.4, engineering design drawings, and the manufacturer's installation instructions.

5.2 Use soft connectors to connect the outdoor unit and indoor heating and cooling equipment.

5.3 Install condensate water drain pipes to the indoor fan coil units with smooth drainage lines for the condensate water to flow easily.

## **6. Electrical wiring**

6.1 The heat pump outdoor unit should be installed in accordance with electrical regulations and Australian Standard AS/NZS3000.

6.2 The power cable of the outdoor unit must support the maximum starting current requirements.

6.3 The outdoor unit power supply circuit must have a grounding wire, which should connect with a reliable and effective external ground wire.

6.4 Wiring must be installed by qualified technicians with reference to the circuit diagram.

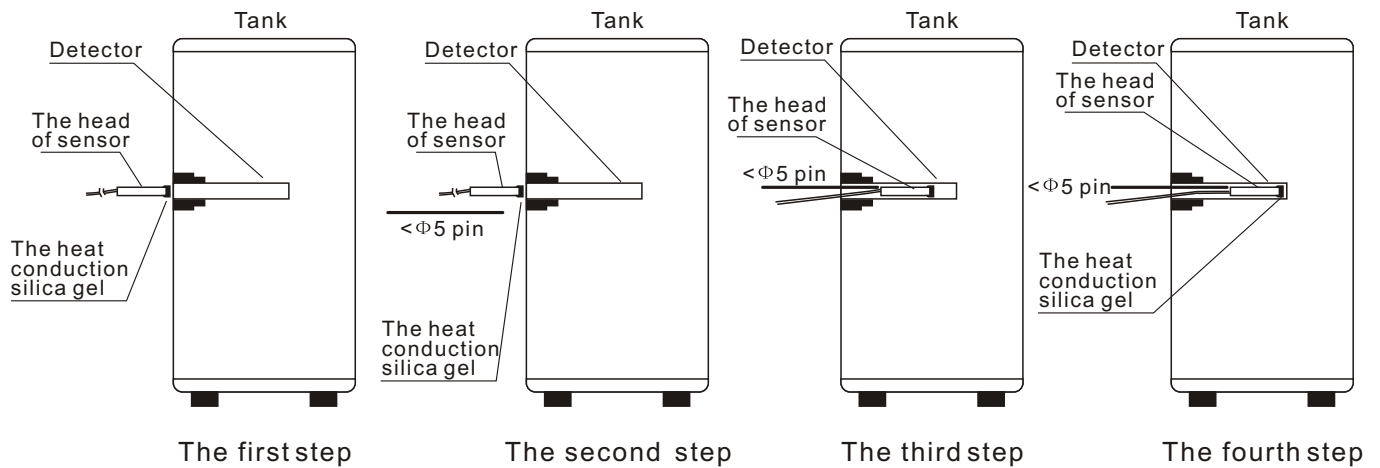
6.5 The layout of power lines and signal lines should be neat, rational and strong with weak lines separated so they cannot interfere with each other.

6.6 When power lines and control lines are parallel, the wires must be placed inside an insulating tube, with appropriate distance between the lines.

6.7 For electrical connection of the outdoor unit, take the following wiring through the wiring hole set into the electrical box, then connect to the appropriate terminals in the electrical box according to wiring diagram:

- Power line
- Remote control three core lines
- Electric heater power line
- Solar circulating water pump control power line
- Water tank electrical boost element
- Temperature sensing line
- Solar collector temperature sensor line
- Terminal equipment
- Outdoor unit lines

## 7. Installation of the temperature detector



7.1 Firstly, daub heat conductive silicone onto the front of the temperature sensor, then insert it into the temperature detector.

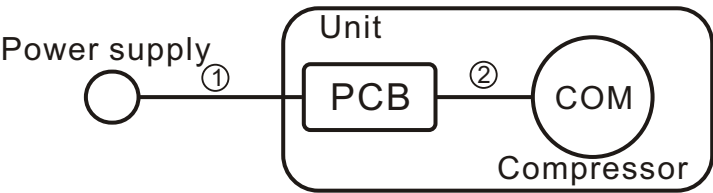
7.2 Next, push the temperature sensor with the pin through to the end of the temperature detector, then mark the level of the pin on the temperature detector.

7.3 Next, pull the pin out and check that the position of mark is at the same level as the inlet of the temperature detector and check whether the sensor is inserted into the pipe terminal.

7.4 Finally, seal the inlet of the temperature detector with silicone, and keep the inlet of the temperature detector upright for about an hour.

## 8. Electrical Wire Selection

8.1 We recommend the following wiring specification to avoid difficulty in starting the compressor from the initial voltage drop.



### 8.2. Size Table of Electrical Wire

Starting current (A)	The wiring specifications (mm } Mark①(Heat resistance temperature above 60℃)							Mark②(Heat resistance temperature above 120℃)
	within 5m	Within 10m	Within 15m	Within 20m	Within 30m	Within 50m	Within 1m	
Below 20	2.0	2.0	2.0	3.5	5.5	8.0	2.0	
Below 30	↑	↑	3.5	5.5	↑	14.0	↑	
Below 40	↑	3.5	5.5	↑	8.0	↑	↑	
Below 50	↑	↑	↑	8.0	14.0	22.0	↑	
Below 60	↑	5.5	↑	↑	↑	↑	↑	
Below 70	3.5	↑	8.0	14.0	↑	↑	3.5	
Below 80	↑	↑	↑	↑	22.0	30.0	↑	
Below 90	↑	↑	14.0	↑	↑	↑	↑	
Below 100	↑	8.0	↑	↑	↑	38.0	↑	
Below 110	↑	↑	↑	↑	↑	↑	↑	
Below 120	5.5	↑	↑	22.0	30.0	↑	↑	
Below 140	↑	14.0	↑	↑	↑	50.0	5.5	
Below 160	↑	↑	22.0	↑	↑	↑	↑	
Below 180	↑	↑	↑	↑	38.0	60.0	8.0	
Below 200	8.0	↑	↑	30.0	↑	↑	↑	
Below 220	↑	↑	↑	↑	50.0	80.0	↑	
Below 240	↑	↑	↑	↑	↑	↑	14.0	

Power supply installation condition: The touching space of breaker should be more than 3mm, use copper wire only.



### 8.3 Grounding caution

The internal motor protector does not protect the compressor against all possible conditions. Please be sure that the system is properly earthed when installed in the field.

### 8.4 Warning:

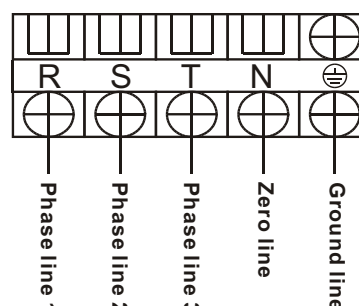
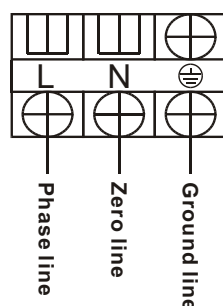
To avoid fire, electric shock and other accidents, only use power supply voltage indicated on the label.

8.5.To protect the power lines, they should be fixed appropriately so that they cannot become damaged and people cannot trip over them. Pay particular attention to the positioning and operation of electrical plugs, which should be easily plugged into the socket.

8.6.Do not overload wall plugs or the power cable line. Overloading may cause fire or electric shock.

8.7.Check to ensure your electrical socket is appropriate for the power load and is properly grounded.

### 8.8.Specification table of power wiring:



Mode	Host Power	Phase line	Zero line	Ground line	Max.line length	Signal line	Tem. sensor assistance line	Max.line length
020ZA/(E01)	220V/1PH/50Hz	2.0mm <sup>2</sup>	2.0mm <sup>2</sup>	2.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
025ZA/(E01)		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
030ZA(B)/(E01)		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
030ZA(B)/(E01)		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
035ZA(B)/(E01)		4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
040ZA(B)/(E01)		4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
040ZA(B)/S(E01)	380V/3PH/50Hz	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
045ZA(B)/S(E01)		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
050ZA(B)/S(E01)		4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
060ZA(B)/S(E01)		4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
080ZB/S(E01)		6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
100ZB/S(E01)		6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
120ZB/S(E01)		10.0mm <sup>2</sup>	10.0mm <sup>2</sup>	10.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m
200ZB/S(E01)		16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	15m	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50m

#### Note:

- 1.Use PVC insulated copper wire for the above wiring
- 2.If your installation requires longer wiring than specified in the table above, contact your installer or Siddons.

## **9. Trial operation by qualified installer**

### **9.1 Pre-start-up checks:**

Check the whole pipe system. Ensure the water volume in the system is full and the air is exhausted completely. Check whether the water valves are open throughout the system.

Check the thermal insulation of the pipe work, make sure relevant pipes are appropriately lagged.

Check the power supply and distribution system. Check whether the power supply voltage is normal, the power distribution accessory screws are tight, supply power complies with the wiring diagram and outdoor unit specifications and the wiring is properly grounded.

Check the air cooled water chiller. Make sure all screws are tight. Check that the signal indicator light (green) of the outdoor unit control panel is illuminated normally and the fault indicating lamp (red) is illuminated.

Connect pressure gauges to the suction Schrader valves in preparation for checking the refrigerant pressure during operation. Disconnect them when testing is satisfactory.

### **9.2 Trial operation**

Press on/off on the remote controller, the water pump and fan should start immediately. The compressor should start shortly after. Observe and determine if there is any abnormal sound during operation. Stop to check the unit if there is abnormal sound. The outdoor unit should continue to run only when there is no abnormal sound.

Check whether the cooling system pressure is normal.

Check whether the input power and current of the unit are within the parameters set out in this manual. If not, stop the outdoor unit and check it.

Observe whether the outlet water temperature is normal.

9.3 The parameters of the remote controller have been pre-set at the factory. We recommend that you leave these parameters as set.

# III. USE

## 1. Wire controller device installation

The remote controller is designed for standard wiring and to fit a standard electrical box with dimensions 86 x 86mm, fixed hole distance 60mm. The illustration below shows how to open and fix the controller and base box. You may request from SIDDONS extension wiring for the remote controller and a blank panel to fit onto the casing after relocating the controller.

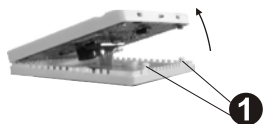


Illustration 1

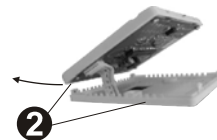


Illustration 2

- ① Use a flat screwdriver to press down the two tabs and lift open the face covering.

- ② Remove the top covering leftwards to disengage two top tabs.

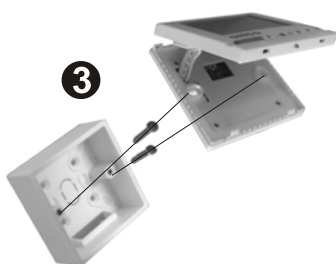


Illustration 3



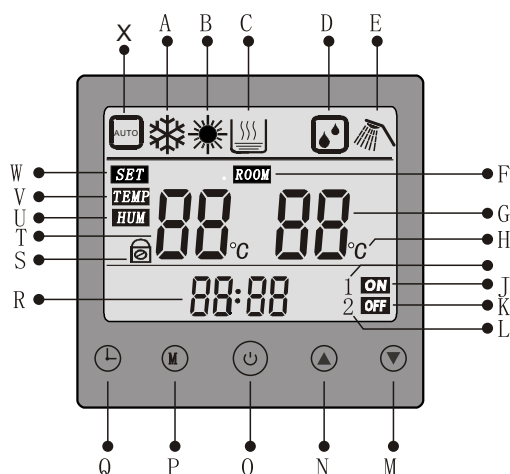
Illustration 4

- ③ Put the digital controller into the base box and tighten the two setting screws.

- ④ Complete the installation by pressing the digital controller down firmly to reengage the tabs.

## 2.The user interface and function shows as below.



Symbol	Icon	Legend
A		Cooling mode icon
B		Heating mode icon
C		Hot water tank mode icon
D		Defrost icon
E		Water supply demand icon
F		Air conditioning mode icon ①
G		Room temperature ②
H		Celsius units
I		Unit turn on/off timer icon ③
J		Timer on icon
K		Timer off icon
L		Water supply function timer icon ④
M		Down setting button
N		Up setting button
O		Unit turn on/off button
P		Model select setting button
Q		Timer and clock setting button
R		Time display area
S		Button lock icon
T		Water setting temperature ⑤
U		Auxiliary electrical heating icon ⑥
V		Temperature icon
W		Setting icon
X+B		Curve Heating Mode ⑥

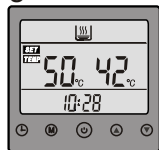


- Note ① : This icon is to show whether it is in hot water tank mode or air conditioning mode. When this icon appears, it shows that the unit is running air conditioning mode.
- Note ② : In standby mode, this temperature means the ambient temperature. In hot water tank mode, this temperature means hot water tank temperature. In air conditioning mode, this temperature means water inlet temperature.
- Note ③ : Please distinguish between these two icons. 1 is unit turn on/off timer, 2 is water supply function timer.
- Note ④ : In standby mode, it will not show here. In hot water tank mode, it is hot water tank temperature. In air conditioning mode, it is inlet water temperature.
- Note ⑤ : When manually engaged auxiliary electrical heating, the icon will flash.
- Note ⑥ : Icon X and Icon B light up under curve heating mode.

### 3. Use of wire controller

#### 3.1 Turn on/turn off the unit

Under standby status, press the  button to turn on the unit, the operation mode icon display on the wire controller will show the unit running in operation mode, as in picture 1 below. Press the  button again to turn off the unit and the wire controller will show the unit off as in picture 1.



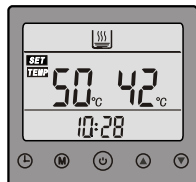
Picture 1



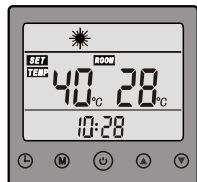
Picture 2

#### 3.2 Model select operation

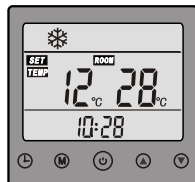
Under the running status, press the  button to change the running mode.



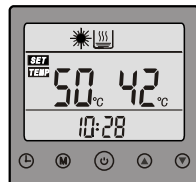
Hot water mode



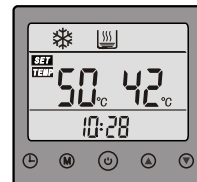
Heating mode



Cooling mode



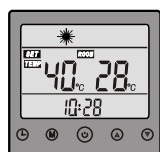
Hot water +  
Heating mode



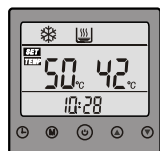
Hot water +  
Cooling mode



Hot water mode, the temperature on the left side of the wire controller is the set temperature of hot water tank, and on the right side is the actual temperature of the hot water tank.









Air conditioning mode, the temperature on the left side of the wire controller is the set temperature of water inlet (heating or cooling), and on the right side is the actual temperature of water inlet.



Hot water mode and air conditioning mode, the unit default priority is hot water mode. Therefore the unit will run in hot water mode first, and the number on the left side of the wire controller is the set temperature of hot water tank, and on the right side is the actual temperature of the hot water tank. When the hot water tank temperature reaches the set temperature, the unit will run in air conditioning mode automatically. This moment the temperature on the left side of the wire controller is the set temperature of water inlet (heating or cooling), and on the right side is the actual temperature of the water inlet.

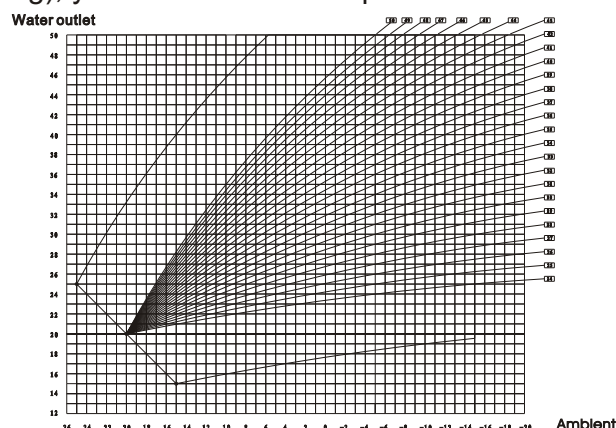
#### 3.3 Modify the set temperature

Under the hot water mode, press  button and  button to modify the set temperature of the hot water. Under the air conditioning mode, press  button and  button to modify the set temperature of the water inlet.

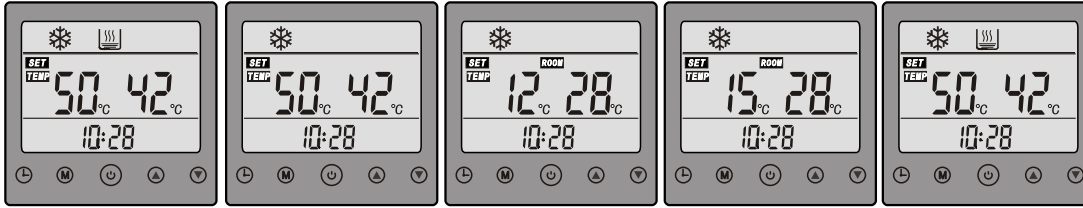
Under the hot water and air conditioning mode, press  button and  button to modify the set temperature of the current operating mode. If the unit is running in hot water mode, and you want to modify the set temperature of water inlet (heating or cooling), you can follow the steps below.

#### 3.4 Curve Heating Mode

Curve heating is used to determine the set outlet temperature by ambient temperature. This calculation can control the electric consumption power more intelligently and thus realize energy-saving.



For example, if the unit is running in hot water mode, then the wire controller display will show hot water mode and cooling mode. The unit is running hot water mode. However, if you want to modify the set temperature of the water inlet in cooling mode, then the wire controller display will show as follows:



Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Press (M) button until the wire controller icon appears. Two seconds later, the display temperature on the wire controller will change (refer to picture 2 and picture 3). Now you can press (▲) button and (▼) button to modify the set temperature of the water inlet in cooling mode. After modification, press (M) button to revert to the former mode.

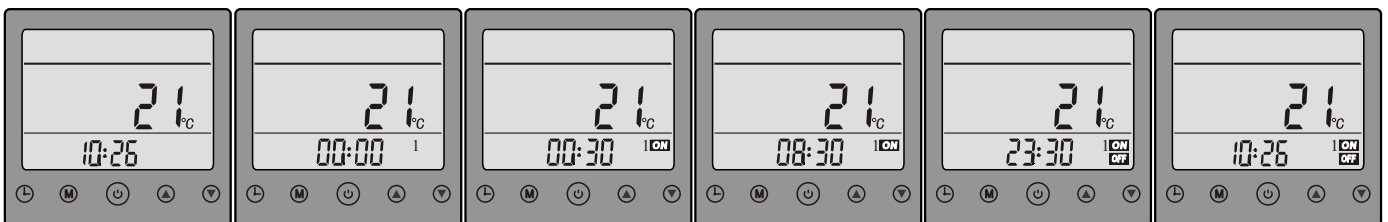
### 3.5 Clock setting

Press the (⌚) button for 3 seconds and the minute display will flicker, press (▲) or (▼) button to adjust the minute setting. Then press (⌚) button and the hour display will flicker. Press the button (▲) or (▼) to adjust the setting. Press (⌚) button again to complete and exit the time setting mode.

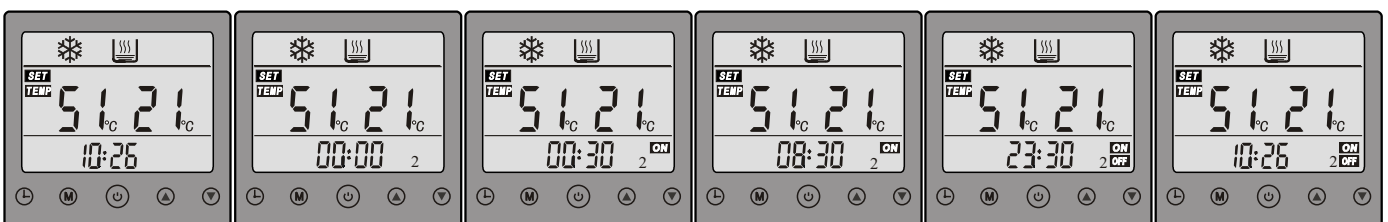
### 3.6 Unit turn on /turn off timer and water supply timer setting

Press (⌚) button and the Timer 1 ON display will flicker, press (▲) or (▼) button to choose Timer 1 or Timer 2. Timer 1 will turn the unit on/off. Timer 2 is for a ring main timer and if the icon is flickering, then you have selected it. Press (⌚) button again and the minute display will flicker. Press (▲) or (▼) button to adjust the minute setting. Then press (⌚) button and the hour display will flicker. Press the button (▲) or (▼) to adjust the hour setting. Press (⌚) button again to complete the process and exit the ring main timer setting mode. (If you are setting timer on, it will enter to timer off setting interface after press this button.)

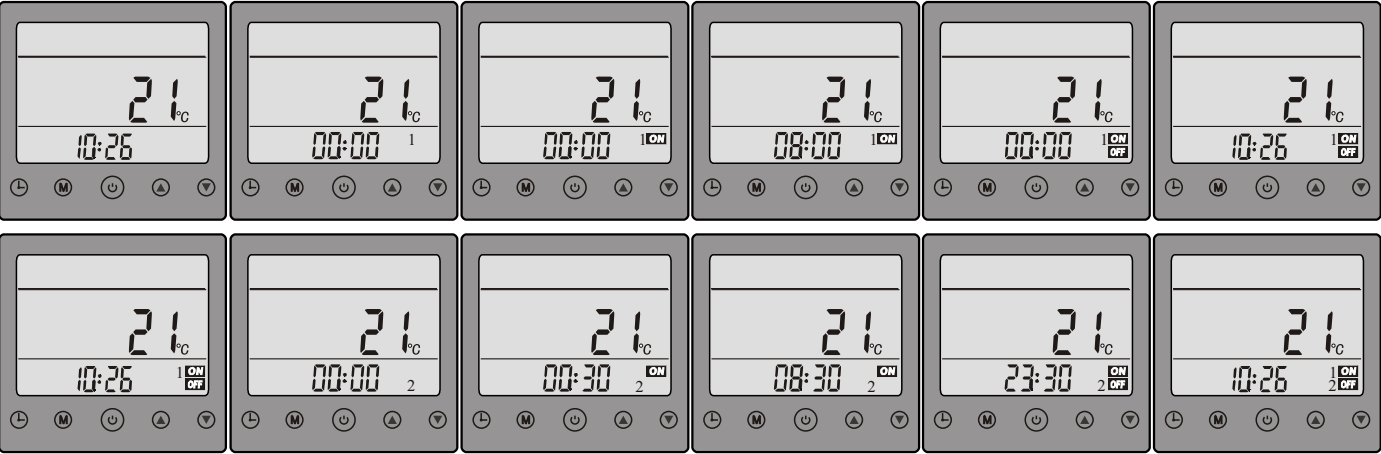
Example 1, setting the unit to turn on at 8:30 every morning, and turn off at 23:30 every night.



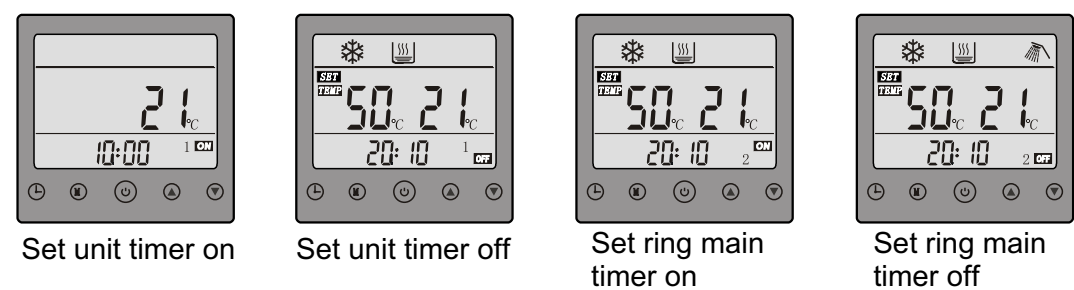
Example 2, setting the unit's hot water supply ring main to turn on at 8:30 every morning and turn off at 23:30 every night. (If you turn off the unit, the hot water supply ring main will not operate).




Example 3, setting the unit to turn on at 8:00 every morning and turn off at 00:00 midnight every night. The hot water supply ring main is set to turn on at 8:30 every morning and set to turn off at 23:30 every night.




NOTE ❶ Every time you manually turn the heat pump out door unit on or off, all timer settings will be cleared.  
 NOTE ❷ If you choose to set both timers, they both need to be set on and off. If you have set both timers, then the wire controller is shown as follows:




### 3.7 Manual water supply

In opreating mode, press ▲ and ▼ buttons at the same time for 3 seconds. The icon  will on the wire controller. This means that the hot water supply ring main function is turned on. The unit will automatically judge whether the hot water supply valve will output or not depending on the water supply temperature.  
 (NOTE: After the manual operation of water supply, the hot water supply timer will be cleared).

### 3.8 Keyboard locking / unlocking operation

Without operation of the wire controller for 30 seconds, the icon  will display on wire controller. This means that the keyboard is locked. To unlock, press ⏻ button for 3 seconds.

### 3.9 Manual open auxiliary electrical heating (only effective if the unit is fitted with auxiliary electrical heating).

In running mode, press Ⓜ button for 3 seconds. The icon  will display on the wire controller and keep flashing. This means that the auxiliary electrical heating function is turned on.  
 (NOTE: The unit's default setting will automatically open the auxiliary electrical heating if required.)

### 3.10. Checking of operating parameters

Press ⌚ and Ⓜ button at the same time to enter the parameter status interface.

Symbol	Means	Symbol	Means
d0	Hot water tank temperature	d5	Water outlet temperature
d1	Ambient temperature	d6	Electronic expansion valve steps
d2	Discharge temperature	d7	Water supply temperature
d3	Coil temperature	d8	Water inlet temperature
d4	Suction temperature	d9	Cold coil temperature

Note: Parameters d4, d6 and d9 are only relevant to units with electronic expansion valves.

### 3.11 Waterway Cleaning

Press ⌚ and Ⓜ once at the same time to enter parameter setting interface, and set parameter 44 to be 1 (Air conditioning waterway cleaning) or 2 (Domestic waterway cleaning).



#### 4. Modify system parameters (for technicians)

Press  $\odot$  and  $\textcircled{M}$  button at the same time to enter the System parameter interface.

Press  $\odot$  button to confirm the modified parameters.

Number	Means	Range	Default
0	Water tank temperature setting of hot water tank mode	20℃~60℃	55℃
1	Water return inlet temperature setting in heating mode	20℃~60℃	40℃
2	Water flow outlet temperature setting in heating mode	20℃~60℃	40℃
3	Water inlet temperature setting in cooling mode	8℃~28℃	12℃
4	Maximum time in defrost mode	1~15min	8min
5	Coil temperature to start defrost mode	-20℃~10℃	-7℃
6	In air conditioning mode is 0 to stop the water cycle pump working after compressor turns off or 1 to keep it working after the compressor turns off.	0/1	0
7	In DHW heating mode is 0 to stop the water cycle pump working after compressor turns off or 1 to keep it working after the compressor turns off.	0/1	0
8	The ambient temperature setting to turn on the auxiliary electrical heating	-30℃~30℃	15℃
9	The ambient temperature setting to turn on the EVI valve	-20℃~15℃	5℃
10	Hot water tank mode, water tank temperature difference between the unit heating stop and heating restart	1℃~10℃	5℃
11	The compensation factor of hot water tank temperature	0℃~10℃	2℃
12	The control mode of electronic expansion valve, 0:automatic 1:manual	0/1	0
13	Automatically control the electronic expansion valve, the set temperature of target superheat	-15℃~15℃	5℃
14	Manual control of the electronic expansion valve, the set step of working conditions 1	10~47	47
15	Manual control of the electronic expansion valve, the set step of working conditions 2	10~47	47
16	Manual control of the electronic expansion valve, the set step of working conditions 3	10~47	30
17	Manual control of the electronic expansion valve, the set step of working conditions 4	10~47	25
18	Manual control of the electronic expansion valve, the set step of working conditions 5	10~47	47
19	Manual control of the electronic expansion valve, the set step of working conditions 6	10~47	47
20	Manual control of the electronic expansion valve, the set step of working conditions 7	10~47	47
21	Manual control of the electronic expansion valve, the set step of working conditions 8	10~47	47
22	Manual control of the electronic expansion valve, the set step of working conditions 9	10~47	35
23	Manual control of the electronic expansion valve, the set step of working conditions 10	10~47	35
24	Automatic control of the electronic expansion valve, when the discharge temperature is over 94℃, the step of expansion valve.	10~47	45
25	Automatic control of the electronic expansion valve, when the discharge temperature is over 98℃, the step of expansion valve.	10~47	47
26	Cooling mode, water inlet temperature difference between the unit cooling stop and cooling restart	1℃~10℃	5℃
27	Mode selection of the unit (0:hot water, 1:heating, 2:hot water+heating, 3:cooling, 4:heating+cooling, 5:multifunction)	0~5	5
28	The limit of heating mode set temperature	20℃~55℃	40℃
29	Heating mode, water inlet temperature difference between the unit heating stop and heating restart	1℃~10℃	5℃
30	Water supply temperature difference between the unit supply stop and supply restart	1℃~10℃	5℃
31	The limit of Domestic Hot Water tank mode set temperature	20℃~60℃	55℃
32	The discharge temperature over-temperature setting	70℃~110℃	105℃
33	Exit the defrost mode setting, coil temperature	5℃~45℃	13℃
34	Heating defrost cycle setting	30min~150min	45min

35	The selection of water return valve, solar water pump or unloading valve 0: water return valve, 1:solar water pump, 2:unloading valve	0/1/2	2
36	The difference setting of solar cycle pump start	3℃~15℃	10℃
37	The optional of auxiliary electric heater 0:without electric heater, 1:hot water electric heater 2:electric air conditioner, 3:hot water + electric air conditioner	0~3	0
38	The auxiliary electric heater start delay time (the delay time after the compressor turns on)	0~90min	30min
39	Manual start for electrical heating in water cycle pump working mode 0: turn off 1: keep working	0/1	1
40	Defrost mode compressor maximum run time setting	0~90min	8min
41	Defrost mode compressor downtime setting	10min~120min	40min
42	The discharge temperature setting of the unloading valve to turn on	90℃~120℃	98℃
43	Temperature difference for closing the unloading valve. Range of adjustment	0~30 ℃	15℃
44	Selection of cleaning function before powering off: 0:Close, 1:Air-conditioning waterway cleaning, 2:Domestic waterway cleaning	0~2	0
45	Curve translation. Range of adjustment: 0~30	0~30	10
46	Curve slope. Range of adjustment: 30~60	30~60	30

## 5. Manual control the electronic expansion valve (Parameters 14~25) (for technicians)

In the following conditions, the step of electronic expansion valve

**Domestic Hot Water tank mode and Heating mode**

Ambient temp. Water outlet temp.	<0℃	1~10℃	11~25℃	>26℃
<45℃	Parameter 14	Parameter 15	Parameter 16	Parameter 17
>45℃	Parameter 18	Parameter 19	Parameter 20	Parameter 21

### Cooling mode

Ambient temp. Water outlet temp.	<40℃	>40℃
<35℃	Parameter 22	Parameter 23
>35℃	Parameter 24	Parameter 25



# IV. Maintenance and repair

## 1. Note

1.1 The water filter should be cleaned periodically. Clean it after the first 3 months to check for sediment build-up and depending on the mineral content of your water determine how often the filter should be cleaned. Regions with pure mountain water will require less maintenance than those with mineralised water.

1.2 Try to maintain a dry, clean and well vented environment for the outdoor unit. Check the side air exchanger after the first 3 months to check for dust build-up and depending on the air environment determine how often the filter should be cleaned to maintain high exchange efficiency.

1.3 Check whether the working pressure of the refrigerant system is normal. Repair and change the parts if there's any abnormality.

1.4 Check whether the electrical parts are performing normally or if there is any unusual odour. Repair and change the parts if there's any abnormality.

1.5 Inspect the unit if it stops for a long time. In areas with sub zero temperatures ,discharge all of the water in the pump and throughout the pipe route in case damage has been caused to the water pump and/or pipe caused by frost and ice. Refill the water from the water pump and heat exchanger.

Refill water into the system before the unit is powered on again. You may need to check the impeller in the circulating pump ,particularly in mineralised water areas.

1.6 Cut power to the outdoor unit before any maintenance is undertaken.

## 2. Malfunction indicating table

Malfunction	code	PCB lamp	Reason	Resolution
Hot water tank temperature sensor failure	E 01	1 flash	The sensor is open or short circuit	Check or change the sensor
Ambient temperature sensor failure	E 02	2 flash	The sensor is open or short circuit	Check or change the sensor
Discharge temperature sensor failure	E 03	3 flash	The sensor is open or short circuit	Check or change the sensor
Coil temperature sensor failure	E 04	4 flash	The sensor is open or short circuit	Check or change the sensor
Suction temperature sensor failure	E 05	5 flash	The sensor is open or short circuit	Check or change the sensor
Water outlet temperature sensor failure	E 06	6 flash	The sensor is open or short circuit	Check or change the sensor
Water flow protection	E 07	7 flash	No water, little water flow or volume too low in hydronic system.	Check the water flow volume, blockage, kinked pipe or water pump failure.
Communication failure	E 08	8 flash	Communication wire between PCB and wire controller are disconnected.	Check the communication wire
Malfunction of system high pressure protection	E 09	9 flash	System 1 high pressure switch is open	1: Check the hydronic water system to see if it is dirty, blocked or not. 2: Check the evaporator fin coil of the heat pump to see if it is dirty and not allowing good airflow necessary for good heat transfer. 3: Check the refrigerant level and discharge some refrigerant if overcharged. 4: Check the setting of the hot water, reduce slightly from the highest setting.

Malfunction of system low pressure protection	E 10	10 flash	System 1 low pressure switch is open	1: Check the unit to see if there is leak of refrigerant; check if the refrigerant pressure of the system is too low when the unit is running. 2: Repair the leak, evacuate air from the system then recharge with specified refrigerant
Compressor discharge over-temperature protection	E 11	11 flash	System 1 discharge temp. higher than parameter 5 (set temp. for refrigerant discharge).	1: Test the hydronic water system to see if it is dirty, blocked or has a kinked pipe. 2: Check the unit to see if there is a refrigerant leak; check if the pressure of the system is too low when the unit is running.
Freezing protection in winter under standby status	E 12	12 flash	Outside environment temperature is below 2°C in stand by mode.	The system will recover automatically after running antifreeze process.
Water inlet temperature sensor failure	E 13	13 flash	The sensor is open or short circuit	Check or change the sensor
Water supply temperature sensor failure	E 14	14 flash	The sensor is open or short circuit	Check or change the sensor
Cold coil temperature sensor failure	E 15	15 flash	The sensor is open or short circuit	Check or change the sensor
Freezing protection in cooling mode	E 16	16 flash	When the unit is running in cooling mode, the water outlet is cooling too much	The system will recover automatically after running the defrost mode.
Freezing protection of excessive temp.differential of water inlet and water outlet under cooling mode	E 17	17 flash	Water flow volume is not enough, water pressure difference is too low	Check the water flow volume or water system for blockage or kinked pipes.
Phase lacking or phase sequence error of power supply	E 18	18 flash	Power phase protection board is protecting	Check the power protection board setting
Water tank temperature too high protection	E 19	19 flash	During the defrost mode, the water tank temperature is too high	It will return to normal automatically when the water cools down
Auxiliary electric heater overload protection	E 20	20 flash	The auxiliary electric heater overload protection switch is open.	Check whether the auxiliary electric heater working is normal or not.

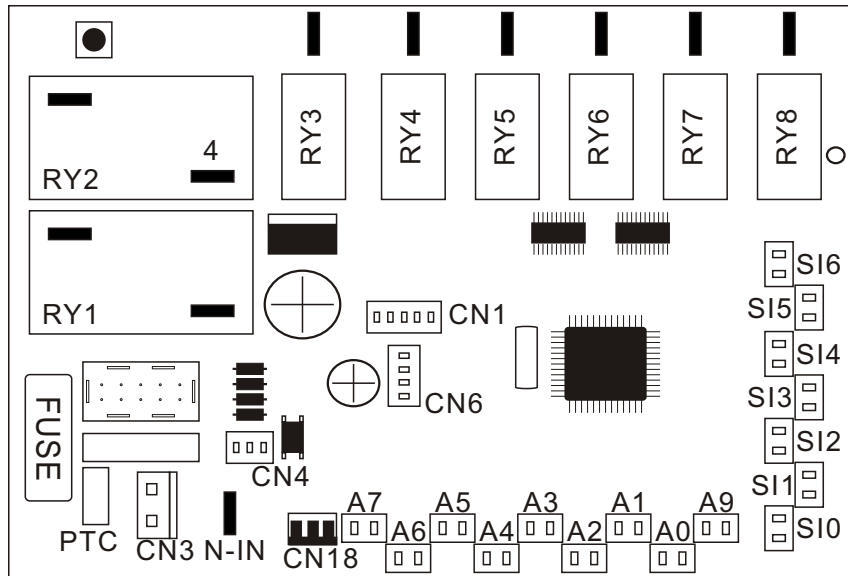
### 3. Judgement and solution of malfunctions

Malfunction	Reason	Solution
Unit does not work	1.Power failure 2.Loose power wire connection 3.Fuse or controller burn-out	1.Turn off power and inspect power supply 2.Identify the cause and rectify 3.Identify the cause and replace with new fuse
The pump is operating, but water isn't circulatory or the noise of pump is too loud	1.Shortage of water or air in the water system 2.Water pump damage 3.Water supply valve not fully open 4.Water filter is blocked	1.Check water supply equipment and replenish system water or remove the air from the water system 2.Change to another pump. 3.Open the valve of the water system 4.Clean the water filter and the pump
Unit heating capacity is low or compressor working too long	1.Shortage of refrigerant or leakage 2.Poor thermal insulation of water system 3.Poor air flow into the air heat exchanger 4.Shortage of water flow	1.Check the system for leakage, fix leak and re-gas 2.Improve thermal insulation of the system pipeline 3.Clean the fin coil with water and improve air flow 4.Check the line strainer on the water inlet and clean it
Compressor discharge pressure too high	1. Water pump is not working 2. There is air in the water system 3. Excessive refrigerant (from repair / re-gas) 4.Heat exchanger not working properly	1. Check / fix power supply to the water pump 2. Open hot water taps, run water until all air expelled 3. Call refrigeration mechanic to reduce refrigerant 4. Call Siddons Service Centre

Compressor suction pressure too low	<ol style="list-style-type: none"> <li>1.Shortage of refrigerant or leakage</li> <li>2.Filter or capillary blocked</li> <li>3.Poor condenser heat dissipation</li> </ol>	<ol style="list-style-type: none"> <li>1.Call refrigeration mechanic to check the system for leakage, fix the leak and re-gas the heat pump</li> <li>2.Replace capillary tube or filter</li> <li>3.Clean the heat exchanger.</li> </ol>
Compressor will not turn on	<ol style="list-style-type: none"> <li>1.Power failure</li> <li>2.Compressor contactor malfunctions</li> <li>3.Loose connection</li> <li>4.Overload protection of compressor activates</li> <li>5.Incorrect setting of the return water temperature in the water tank</li> <li>6.Compressor capacitor malfunctions</li> </ol>	<ol style="list-style-type: none"> <li>1.Check the power supply and restore</li> <li>2.Replace the contactor</li> <li>3.Check for loose wires and re-connect</li> <li>4.Check that the current / Amp draw of compressor is within specification, may require replacement of the compressor</li> <li>5.Reset the return water temperature</li> <li>6.Replace the capacitor</li> </ol>
Loud compressor noise	<ol style="list-style-type: none"> <li>1.Liquid refrigerant enters the compressor</li> <li>2.Compressor breaks down</li> </ol>	<ol style="list-style-type: none"> <li>1.Check the cause for flooding of the compresspr and solve the problem</li> <li>2.Replace the compressor</li> </ol>
Blower is out of operation	<ol style="list-style-type: none"> <li>1.The relay or capacitor of the blower breaks down</li> <li>2.The Blower motor seizes or burns out</li> </ol>	<ol style="list-style-type: none"> <li>1.Replace the blower relay or capacitor</li> <li>2.Replace the blower motor</li> </ol>
The compressor is in operation but the unit does not heat	<ol style="list-style-type: none"> <li>1.The refrigerant has leaked out</li> <li>2.Compressor breaks down</li> </ol>	<ol style="list-style-type: none"> <li>1.Check the system for refrigerant leakage and tell tale signs of oil, repair leak and re-gas</li> <li>2. Check the reason and replace the compressor</li> </ol>

# V. Wiring diagram

## 1. MC3013 controller input and output definition

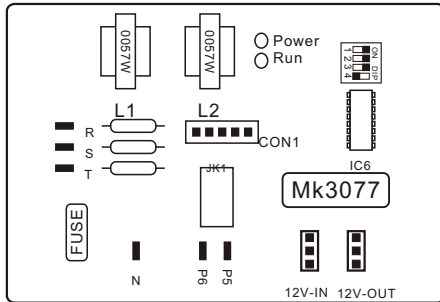


Symbol	Meaning
RY1	Water cycle pump signal output
RY2	Compressor signal output
RY3	Unloading valve output
RY4	Fan signal output
RY5	Four way valve signal output
RY6	Three way valve signal output
RY7	EVI valve signal output
RY8	Auxiliary electric heater output
A7	Hot water tank temperature
A6	Water outlet temperature
A5	Ambient temperature
A4	Discharge temperature
A3	Coil temperature
A2	Suction temperature
A1	Cold coil temperature
A0	Water inlet temperature

Symbol	Meaning
A9	Reserved
SI0	High pressure switch
SI1	Low pressure switch
SI2	Water flow switch
SI3	Power phase and overload switch
SI4	Air conditioning turn on/off switch
SI5	Electric heater overload protection
SI6	Reserved
CN1	Electronic expansion valve
CN3	Transformer input
CN4	Transformer output
N-IN	PCB-power N
CN6	Download program
CN18	Wire controller
4	PCB-power L
FUSE	Fuse

## 2. Power phase sequence protection board setting

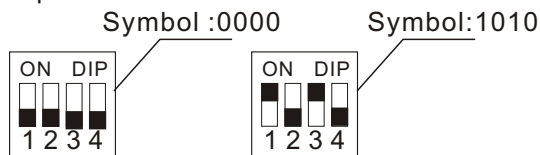
### 2.1. Protection board MK3077 effective for the single system unit



NO .	Symbol	Meaning
1	R	Power input
2	S	Power input
3	T	Power input
4	N	Power input
5	P5	Protection signal output
6	P6	Protection signal output
7	12V-IN	Connect transformer power(12VAC)input
8	12V-OUT	power(12VAC)output

### 2.2. The setting of current protection value

For example:



Symbol	Current value	Symbol	Current value
0011	8A	1010	20A
1101	9A	0010	21A
0101	10A	1100	28A
1001	11A	0100	29A
0001	12A	1000	30A
1110	18A	0000	31A

### 2.3. Every model's factory default value of current protection

Mode	Default
MACHRW050ZA/S(E01)	18A
MACHRW060ZA/S(E01)	18A
MACHRW080ZA/S(E01)	20A
MACHRW100ZA/S(E01)	20A

### 2.4. Power sequence, current protection board failure indication

Run led display	Failure indication	Run led display	Failure indication
1flash 1 off	L1 side overcurrent protection	4flash 1 off	L4 side overcurrent protection
2flash 1 off	L2 side overcurrent protection	5flash 1 off	Power phase sequence protection
3flash 1 off	L3 side overcurrent protection	6flash 1 off	Power phase sequence protection

Explanation of power protection fault and solution:

1: When the unit shows phase order protection, check if the power sequence is correct

A: Check if the detection power sequence is correct, whether there is phase not together.

2: When the unit shows one side with excessive current protection

A: Check if power supply power is too low, or the power cord is too small.

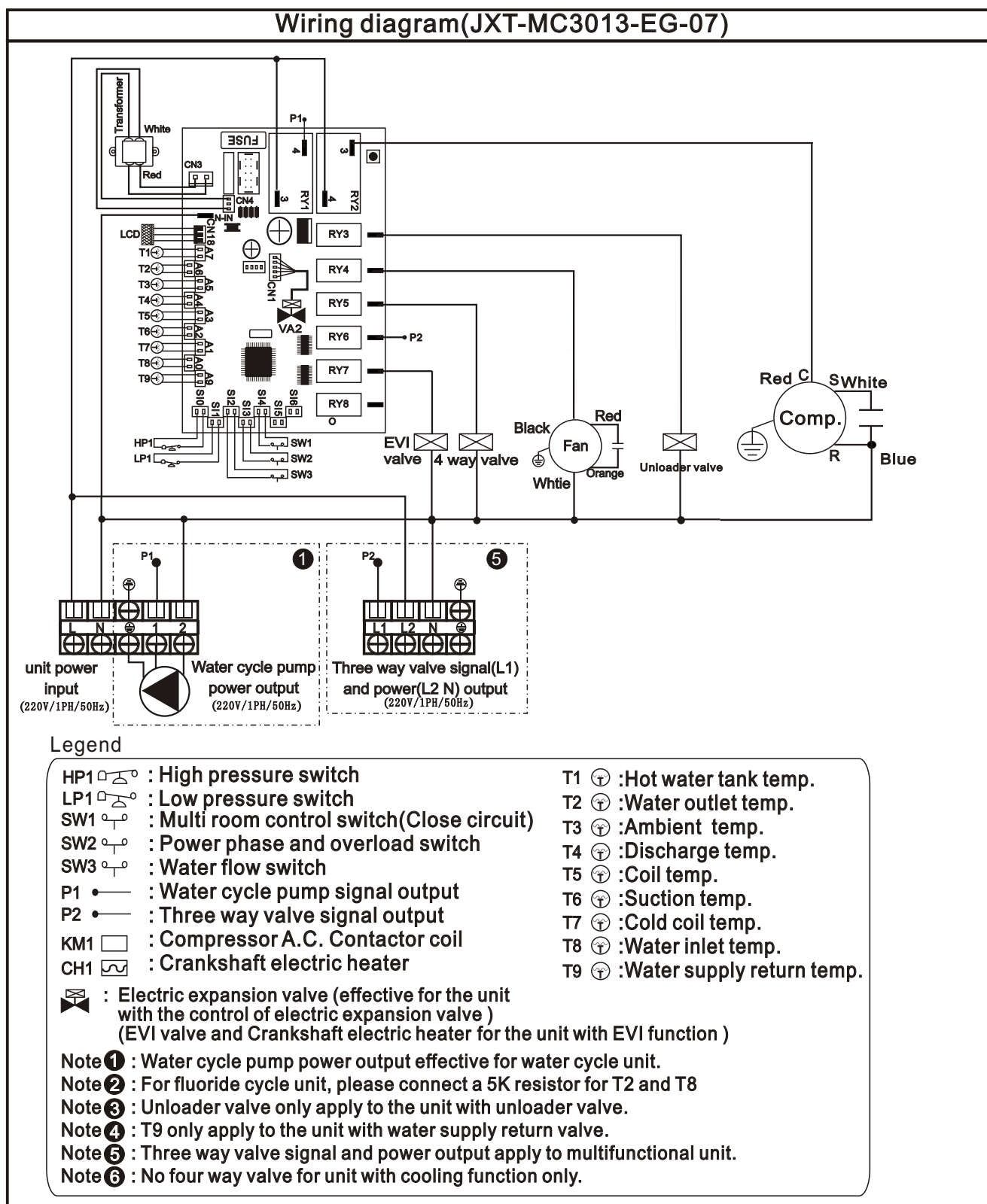
B: Check if the contact of compressor ac contactor is faulty.

C: Check if the compressor has a fault, drawing excessing amperage.

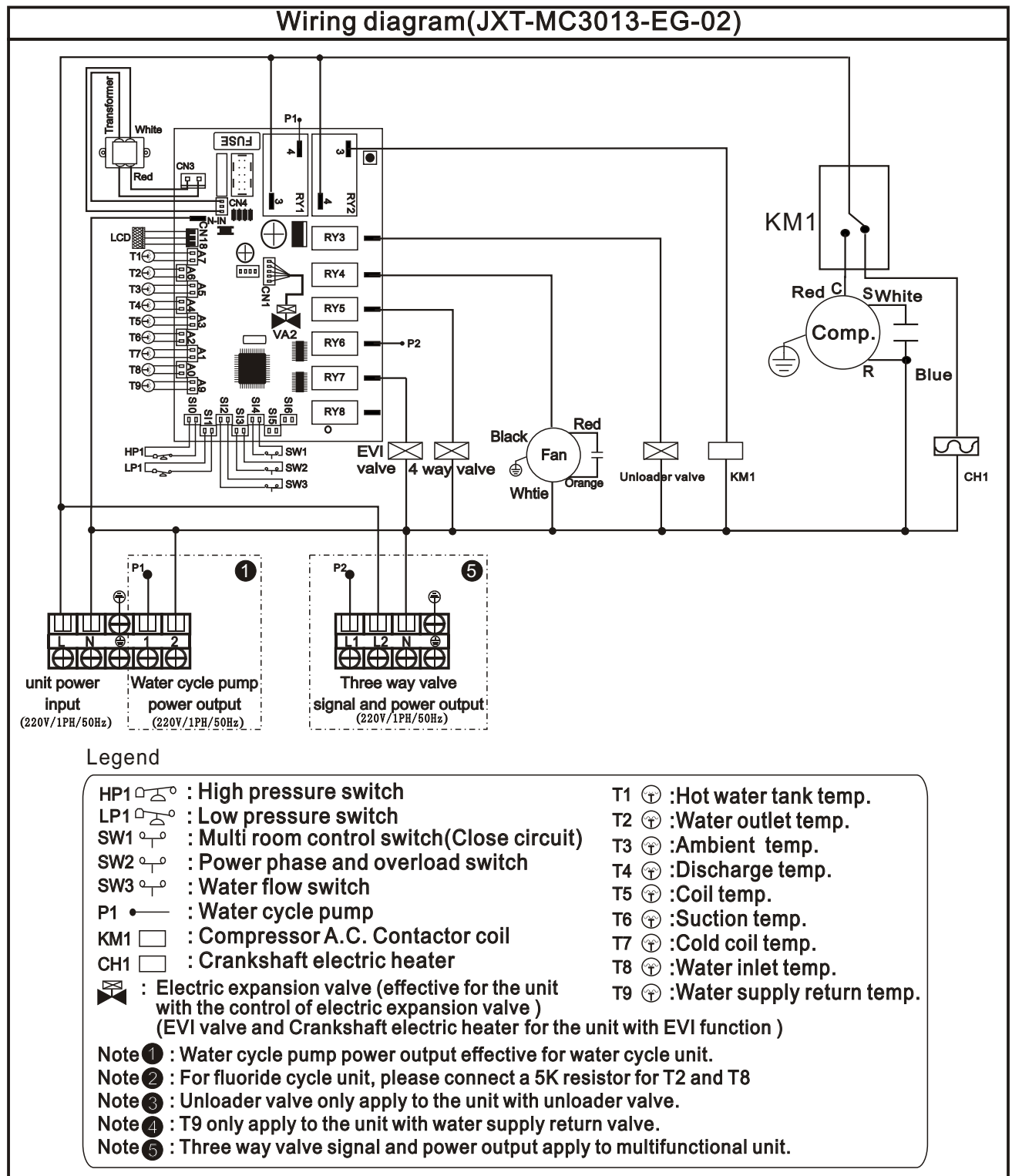
D: Check if the setting of current protection is in accordance with the requirements set value, whether it is too low.

### 3. Wiring diagram

#### 3.1 Wiring diagram JXT-MC3013-EG-07 effective for the mode of MACHRW020ZA/P(E01), MACHRW020ZA/P(01)



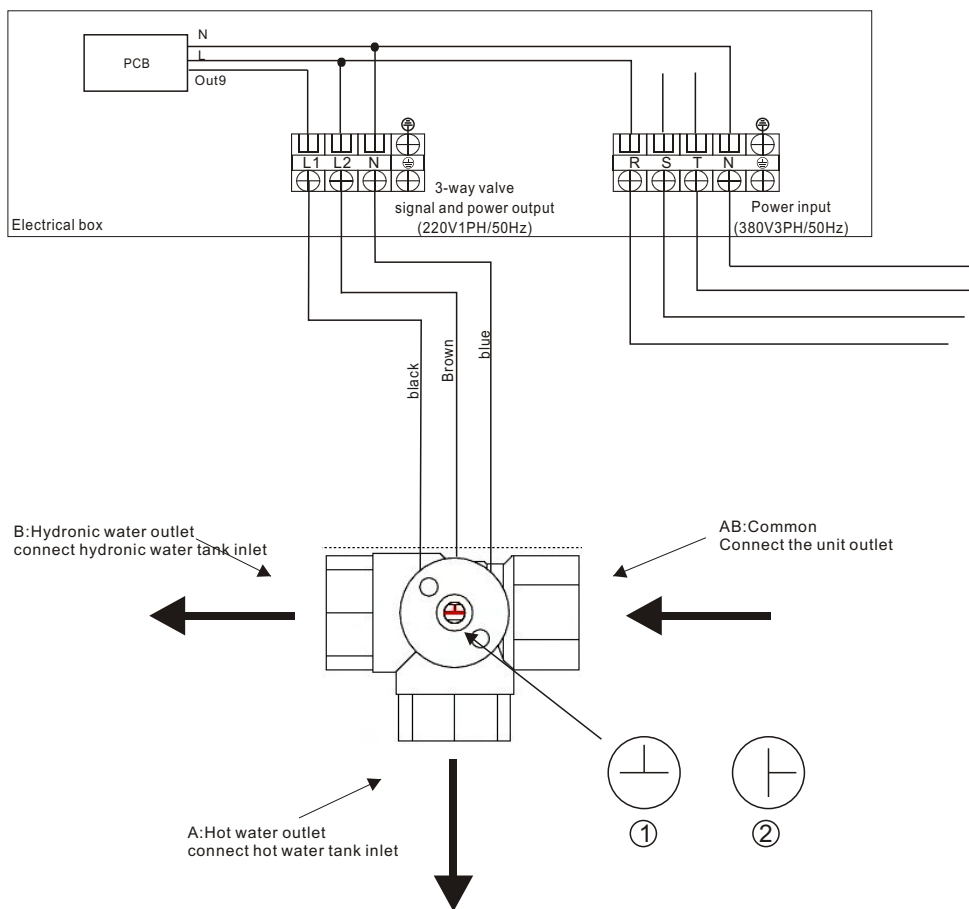
3.2 Wiring diagram JXT-MC3013-EG-02 effective for the mode of MACHRW025ZA/P(E01)  
MACHRW030ZA/P(01) MACHRW030ZA/P(E01)





## 4. Three way valve wiring diagram

Model for the WRA-6320A, WRA-6310A, WRA-6302A wiring instructions ( unit for the three-phase power )



### Notes:

- 1: Check whether the model of electric three-way valve is similar that shown above.
- 2: Check whether electric three-way valve T port is as shown in figure (1).  
If not, Please adjust the 3-way valve T port with forceps as shown in figure (1).
- 3: Electric three-way valve has three wires:  
Brown line for single-phase power supply firewire input.  
Blue line for single-phase power supply zero line input.  
Black line is the signal line, when the black line is connected to the single-phase power supply firewire input, the three-way valve will rotate anti-clockwise by 90 degrees.
- 4: When the PCB is the R-phase power supply, the three-way valve power output L2 terminals must receive R-phase
- 5: Setting for the three way valve:  
When the unit is running hot water mode, T for the three way valve is shown in figure (2) and the water will flow in from AB, and flow out from A.  
When the unit is running in air conditioning mode, T for the three way valve is shown in figure (1) and the water will flow in from AB, and flow out from B.









Code:MC3013-04

# **AIR TO WATER MULTIFUNCTION HEAT PUMP**