

METRAN

INSTALLATION & INSTRUCTION MANUAL

MK3092/MK3093

AIR TO WATER HEAT PUMP

Notice

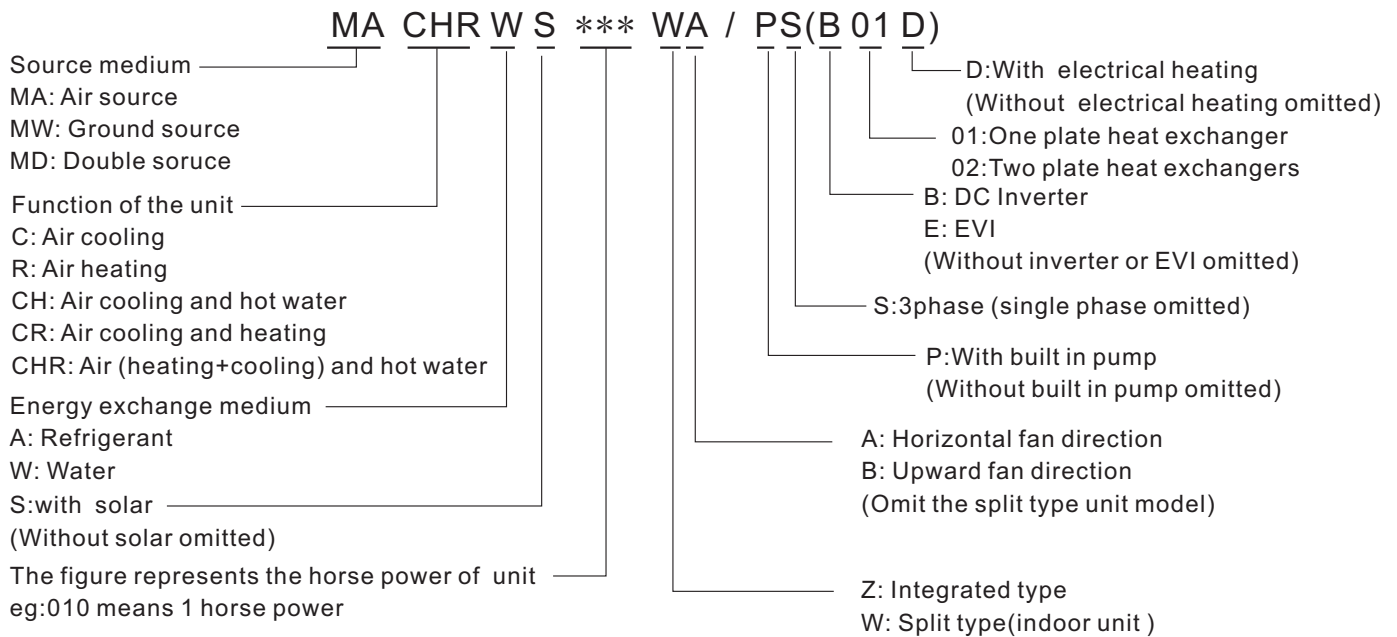
- 1.1 In order to use this product better and safer, please read this instruction carefully before install and operate it. Please pay attention to all the notice in operation and maintenance. Save all manuals and documentation for future reference.
- 1.2 Air to water pump is a special appliance. Improper installation will cause damage and danger. It should be installed and maintained by the professionals. Please contact our authorized local service point for installation and maintenance. Please read and follow this instruction carefully before and during installation.
Remarks:
We will not bear the responsibility for any personal injury or unit damage caused by non-Compliance of the regulations and instruction in this manual.
- 1.3 Please check whether the distribution power capacity, switch and socket are compliance with the requirements of our unit power. Details please refer to the rating label or parameter table in this manual.
- 1.4 The power should be equipped with leakage protection separately.
Power cable should be chosen in accordance with the operation requirements of the unit.
- 1.5 The unit must be grounded safely. Do not use the unit if grounded unsafely.
Do not connect the ground line to the neutral and or tap water pipe.
- 1.6 The wire must be joined in compliance with the requirements of the wiring chart.
Do not alternate and or repair the unit personally.
- 1.7 Do not install the unit closed to inflammable, explosive and naked light spot.
- 1.8 To ensure the unit operate properly, please equipped with a filter in the water input when installation.

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I. Specification

1. Model Nomenclature



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

2.1 Horizontal fan direction type

Model	MACHRWS	015ZA/P(01)	020ZA/P(01)	025ZA/P(01)	030ZA/P(01)	035ZA/P(01)	040ZA/P(01)
Rated Output Water	L/h	105	140	175	225	265	300
Rated Heating Capacity	kW	4.8	6.5	8.0	9.0	10.5	12.0
	BTU/h	16400	22200	27300	30800	35900	41000
Rated Cooling Capacity	kW	3.8	5.0	6.5	7.8	9.1	10.4
	BTU/h	12800	17100	22200	26700	31100	35500
Rated Input Power	kW	1.30	1.80	2.20	2.88	3.36	3.84
Rated Input Current	A	5.9	8.2	10.0	13.1	15.3	17.4
Rated Temp. Of Water Output	°C	55	55	55	55	55	55
Max. Temp. Of Water Output	°C	60	60	60	60	60	60
Power Supply	V/PH/Hz	220/1/50					
Noise	dB(A)	48	48	48	50	54	54
Compressor		Rotary	Rotary	Rotary	Rotary	Rotary	Scroll
Compressor Qty		1	1	1	1	1	1
Fan Qty		1	1	1	1	1	1
Working Temp. Range	°C	-15~45	-15~45	-15~45	-15~45	-15~45	-15~45
Refrigerant Gas Type		R410A					
Water Flow Volume	m ³ /h	1	2	2	2	3	2.8
Circulating Water Out/inlet	inch	1"	1"	1"	1"	1"	1"
Main Unit Net Dimensions(L/M/H)	mm	930/350/550	1005/360/620	1115/470/700	1115/470/945	1115/470/945	1115/470/945
Main Unit Shipping Dimensions (L/M/H)	mm	1035/395/585	1095/405/650	1205/525/725	1205/525/975	1205/525/975	1205/525/975
Net Weight	kg	50	70	90	112	115	125
Shipping Weight	kg	55	80	105	132	135	145

Note: (1)The manual is a technical parameters measured in the following conditions: outdoor dry temperature is 7°C and wet bulb temperature is 6°C, the temperature of water inflow is 15°C and of water outflow is 55°C.
(2)Using in ambient temperature:-15°C~45°C

Model	MACHRWS	045ZA/P(01)	040ZA/PS(01)	045ZA/PS(01)	050ZA/PS(01)	060ZA/PS(01)
Rated Output Water	L/h	340	300	340	380	450
Rated Heating Capacity	kW	13.5	12.0	13.5	15.0	18.0
	BTU/h	46100	41000	46100	51200	61500
Rated Cooling Capacity	kW	11.7	10.0	11.7	13.0	15.6
	BTU/h	40000	34200	40000	44400	53300
Rated Input Power	kW	4.30	3.84	4.30	4.80	5.75
Rated Input Current	A	19.5	6.3	6.6	7.5	9.0
Rated Temp.Of Water Output	°C	55	55	55	55	55
Max.Temp.Of Water Output	°C	60	60	60	60	60
Power Supply	V/PH/Hz	220/1/50	380/3/50			
Noise	dB(A)	54	54	54	54	54
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Qty		1	1	1	1	1
Fan Qty		1	1	1	2	2
Working Temp. Range	°C	-15~45	-15~45	-15~45	-15~45	-15~45
Refrigerant Gas Type		R410A				
Water Flow Volume	m ³ /h	3.2	2.8	3.2	3.5	4.2
Circulating Water Out/inlet	inch	1 "	1 "	1 "	1 "	1 "
Main Unit Net Dimensions(L/M/H)	mm	1115/470/945	1115/470/945	1115/470/945	1115/470/1250	1115/470/1250
Main Unit Shipping Dimensions (L/M/H)	mm	1205/525/975	1205/525/975	1205/525/975	1205/525/1280	1205/525/1280
Net Weight	kg	135	125	135	150	155
Shipping Weight	kg	145	145	155	170	175

Note: (1)The manual is a technical parameters measured in the following conditions: outdoor dry temperature is 7°C and wet bulb temperature is 6°C ,the temperature of water inflow is 15°C and of water outflow is 55°C.
(2)Using in ambient temperature:-15°C~45°C

2.2.Upwards fan direction type

Model	MACHRWS	025ZB/P(01)	030ZB/P(01)	035ZB/P(01)	040WB/P(01)	045ZB/P(01)
Rated Output Water	L/h	175	225	265	300	340
Rated Heating Capacity	kW	8.0	9.0	10.5	12.0	13.5
	BTU/h	27300	30800	35900	41000	46100
Rated Cooling Capacity	kW	6.5	7.8	9.1	10.4	11.7
	BTU/h	22200	26700	31100	35500	30000
Rated Input Power	kW	2.20	2.88	3.36	3.84	4.30
Rated Input Current	A	10.0	13.1	15.3	17.4	19.5
Rated Temp.Of Water Output	°C	55	55	55	55	55
Max.Temp.Of Water Output	°C	60	60	60	60	60
Power Supply	V/PH/Hz	220/1/50				
Noise	dB(A)	50	50	50	50	50
Compressor		Rotary	Rotary	Rotary	Scroll	Scroll
Compressor Qty		1	1	1	1	1
Fan Qty		1	1	1	1	1
Working Temp. Range	°C	-15~45	-15~45	-15~45	-15~45	-15~45
Refrigerant Gas Type		R410A				
Water Flow Volume	m ³ /h	2	2	2.5	2.8	3.2
Circulating Water Out/inlet	inch	1 "	1 "	1 "	1 "	1 "
Main Unit Net Dimensions(L/M/H)	mm	680/680/810	680/680/810	680/680/810	680/680/810	680/680/810
Main Unit Shipping Dimensions (L/M/H)	mm	780/780/910	780/780/910	780/780/910	780/780/910	780/780/910
Net Weight	kg	80	80	85	92	105
Shipping Weight	kg	95	95	100	107	120

Note: (1)The manual is a technical parameters measured in the following conditions: outdoor dry temperature is 7°C and wet bulb temperature is 6°C ,the temperature of water inflow is 15°C and of water outflow is 55°C.
(2)Using in ambient temperature:-15°C~45°C

Model	MACHRWS	045ZB/PS(01)	050ZB/PS(01)	060ZB/PS(01)	080ZB/PS(01)	100ZB/PS(01)
Rated Output Water	L/h	340	380	450	600	750
Rated Heating Capacity	kW	13.5	15.0	18.0	24.0	30.0
	BTU/h	46100	51200	61500	81900	102400
Rated Cooling Capacity	kW	11.7	13.0	15.6	20.8	26.0
	BTU/h	40000	44400	53300	71000	88800
Rated Input Power	kW	4.30	4.80	5.75	7.70	9.60
Rated Input Current	A	6.6	7.5	9.0	12.0	15.0
Rated Temp.Of Water Output	℃	55	55	55	55	55
Max.Temp.Of Water Output	℃	60	60	60	60	60
Power Supply	V/PH/Hz	380/3/50				
Noise	dB(A)	50	50	50	55	55
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Qty		1	1	1	2	2
Fan Qty		1	1	1	2	2
Working Temp. Range	℃	-15~45	-15~45	-15~45	-15~45	-15~45
Refrigerant Gas Type		R410A				
Water Flow Volume	m ³ /h	3.2	3.5	4.2	5.5	7.0
Circulating Water Out/inlet	inch	1 "	1 "	1 "	1-1/4 "	1-1/4 "
Main Unit Net Dimensions(L/M/H)	mm	680/680/810	810/780/1030	810/780/1030	1450/730/1060	1450/730/1260
Main Unit Shipping Dimensions (L/M/H)	mm	780/780/910	910/810/1130	910/810/1130	1545/780/1110	1545/780/1310
Net Weight	kg	105	120	150	250	265
Shipping Weight	kg	120	135	145	275	295

Note: (1)The manual is a technical parameters measured in the following conditions: outdoor dry temperature is 7℃ and wet bulb temperature is 6℃ ,the temperature of water inflow is 15℃ and of water outflow is 55℃.
(2)Using in ambient temperature:-15℃~45℃

Model	MACHRWS	080ZB/P(01)	100ZB/P(01)
Rated Output Water	L/h	600	750
Rated Heating Capacity	kW	24.0	30.0
	BTU/h	81900	102400
Rated Cooling Capacity	kW	20.8	26.0
	BTU/h	71000	88800
Rated Input Power	kW	7.70	9.60
Rated Input Current	A	35.0	43.6
Rated Temp.Of Water Output	℃	55	55
Max.Temp.Of Water Output	℃	60	60
Power Supply	V/PH/Hz	220/1/50	
Noise	dB(A)	55	55
Compressor		Scroll	Scroll
Compressor Qty		2	2
Fan Qty		2	2
Working Temp. Range	℃	-15~45	-15~45
Refrigerant Gas Type		R410A	
Water Flow Volume	m ³ /h	5.5	7.0
Circulating Water Out/inlet	inch	1-1/4 "	1-1/4 "
Main Unit Net Dimensions(L/M/H)	mm	1450/730/1060	1450/730/1260
Main Unit Shipping Dimensions (L/M/H)	mm	1545/780/1110	1545/780/1310
Net Weight	kg	250	265
Shipping Weight	kg	275	295

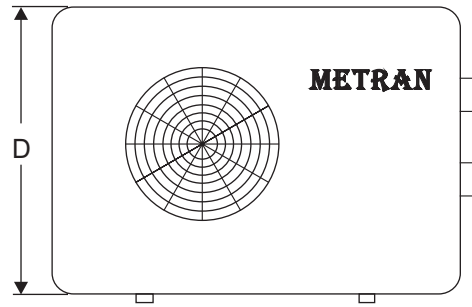
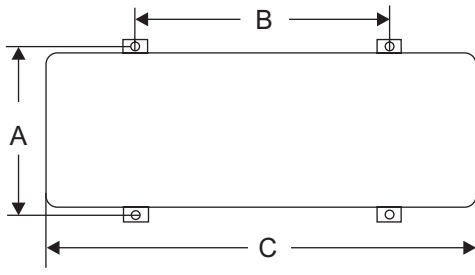
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(2)Using in ambient temperature:-15℃~45℃

2.3. Big horse mode

Model	MACHRWS	120ZA/PS(01)	150ZA/PS(01)	200ZA/PS(01)	250ZA/PS(01)	300ZA/PS(01)
	MACHRWS	120ZB/PS(01)	150ZB/PS(01)	200ZB/PS(01)	250ZB/PS(01)	300ZB/PS(01)
Rated Output Water	L/h	900	1050	1500	1880	2260
Rated Heating Capacity	kW	36.0	45.0	60.0	75.0	90.0
	BTU/h	122900	153600	204800	255900	307100
Rated Cooling Capacity	kW	31.2	37.5	52.0	65.0	78.0
	BTU/h	106500	128000	177500	221800	266200
Rated Input Power	kW	11.50	13.50	19.20	24.00	28.80
Rated Input Current	A	18.0	20.5	30.0	37	44
Rated Temp.Of Water Output	°C	55	55	55	55	55
Max.Temp.Of Water Output	°C	60	60	60	60	60
Power Supply	V/PH/Hz	380/3/50				
Noise	dB(A)	55	55	62	62	62
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Qty		2	2	2	2	2
Fan Qty		2	2	2	2	2
Working Temp. Range	°C	-15~45	-15~45	-15~45	-15~45	-15~45
Refrigerant Gas Type		R410A				
Water Flow Volume	m ³ /h	8.5	10	15.0	18	20
Circulating Water Out/inlet	inch	1-1/4"	2"	2"	2"	2"
Main Unit Net Dimensions(L/M/H)	mm	1450/730/1260	1450/730/1945	2006/1006/1945	2006/1006/1945	2006/1006/1945
Main Unit Shipping Dimensions (L/M/H)	mm	1545/780/1310	1545/780/1310	2400/1206/2145	2400/1206/2145	2400/1206/2145
Net Weight	kg	300	320	700	950	1100
Shipping Weight	kg	325	345	750	1010	1160

Note: (1)The manual is a technical parameters measured in the following conditions: outdoor dry temperature is 7°C and wet bulb temperature is 6°C ,the temperature of water inflow is 15°C and of water outflow is 55°C.
(2)Using in ambient temperature:-15°C~45°C

3. Product appearance and installation dimension

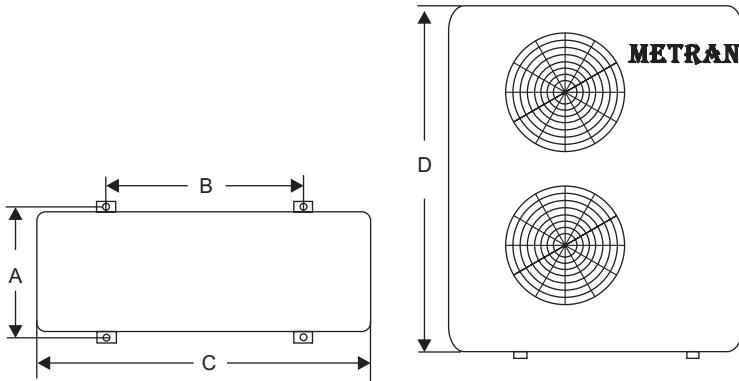


Units: mm

Size \ MACHRWS	010ZA/P(01) 015ZA/P(01)	020ZA/P(01)
A	330	340
B	680	645
C	930	1005
D	550	620

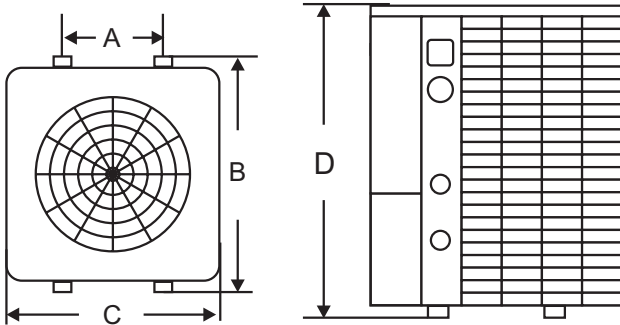
Units: mm

Size \ MACHRWS	025ZA/P(01)	030ZA/P(01)/040ZA/P(S)(01) 035ZA/P(01)/045ZA/P(S)(01)
A	440	440
B	750	750
C	1115	1115
D	700	945



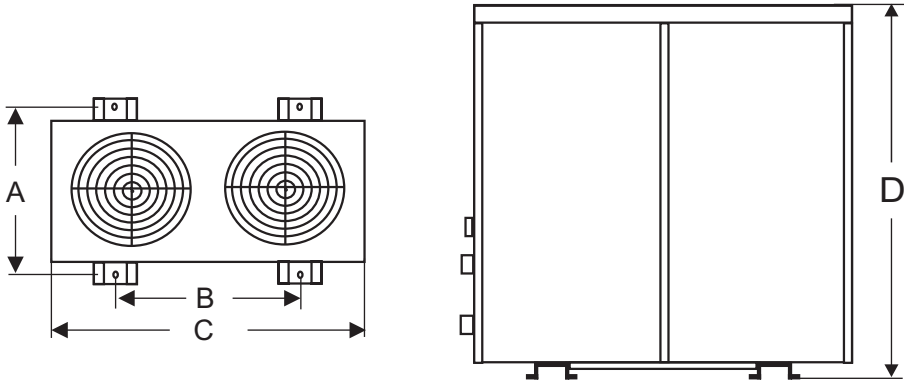
Units: mm

Size \ MACHRWS	050ZA/P(S)(01) 060ZA/P(S)(01)
A	440
B	750
C	1115
D	1250



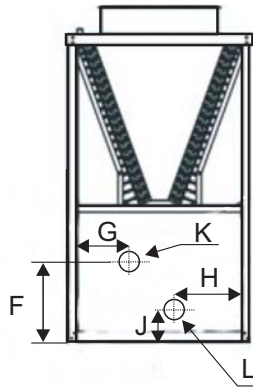
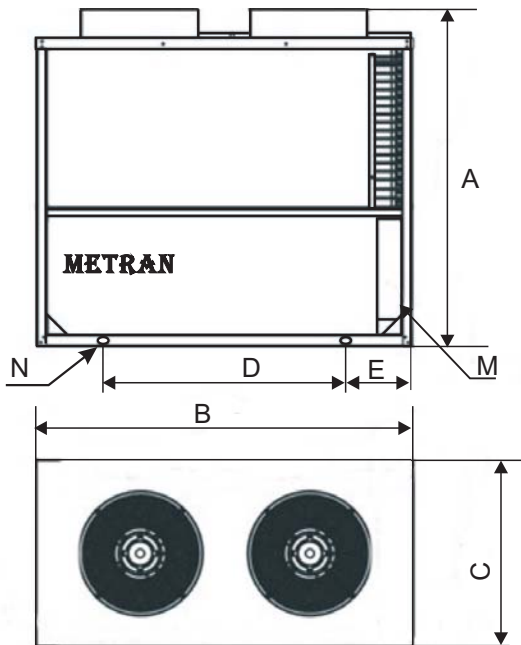
Units: mm

Size \ MACHRWS	025ZB/P(01)/030ZB/P(01)/035ZB/P(01) 040ZB/P(S)(01)/045ZB/P(S)(01)	050ZB/P(S)(01) 060ZB/P(S)(01)
A	300	300
B	685	685
C	680	660
D	810	960



Units: mm

MACHRWS Size	080ZB/P(S)(01)	100ZB/P(S)(01)/120ZB/PS(01) 150ZB/PS(01)
A	708	708
B	750	750
C	1450	1450
D	1060	1260



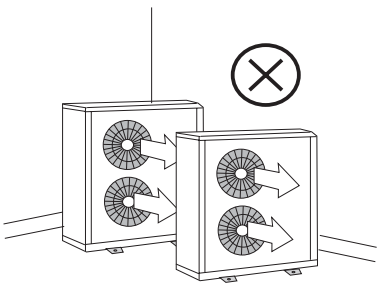
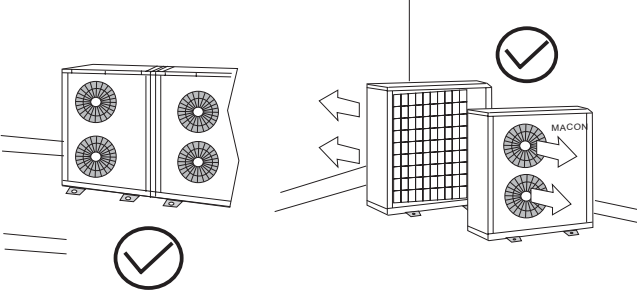
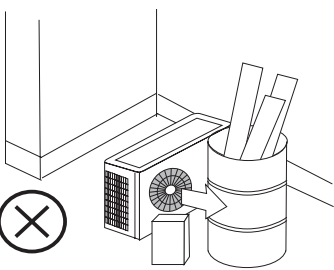
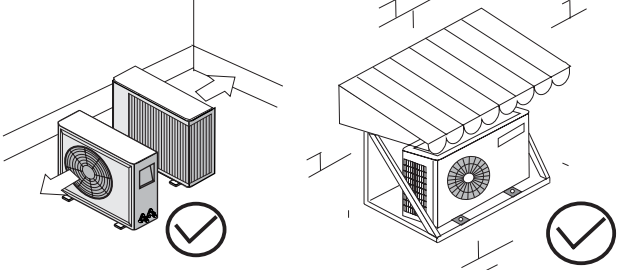
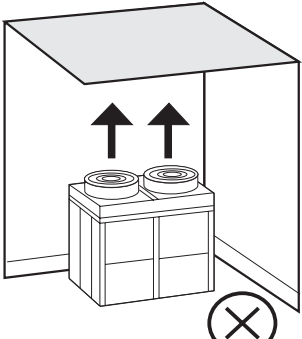
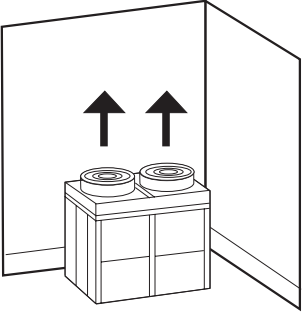
Mode: MACHRWS200ZB/PS(01)

Sign	Meaning	Size(mm)
A	High	1945
B	Length	2006
C	Wide	1006
D	Distance between	1406
E		300
F		325
G		365
H		325
J		85
K		Water outlet
L	Water inlet	2"
M	Electrical box	
N	Starting stents	

II. Installation

1. Unit installation position

To avoid ventilation short, the r unit discharged air should not return when installation.
Please keep enough space around the unit for repair. Right and wrong means as below:

Wrong	Right
	
	
	



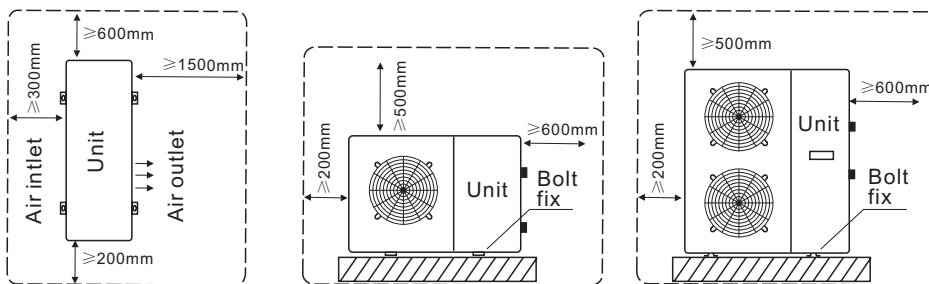
Notice:

1. To get enough air for ventilation of the unit, the installation position should be with good ventilation.
2. The installation position can hold the outdoor unit without noise and shake.
3. No sunlight to the unit. Set an awning if necessary.
4. The water from rain and defrosting can be discharged in the installation position.
5. The unit will not be covered by snow in the installation position.
6. The discharged air will not face strong air in the installation position.
7. Assure the noise caused by the unit ventilation and operation will not affect the neighbour.
8. The installation position will not be affected by garbage, oil and mist.
9. The unit will be damaged under the condition with oil(engine oil), salt(sea area) and sulfide air(near thermal spring and refining factory).

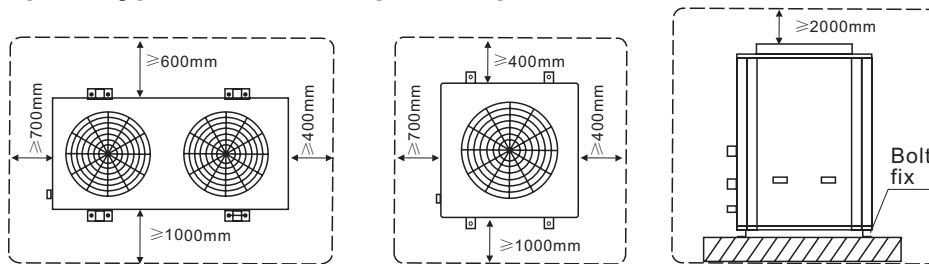
2. Installation requirement

- 2.1. The unit can be installed in the balcony, roof, floor or any other convenient place and reliable load-bearing.
- 2.2. Airiness place.
- 2.3. No heat radiation or other heat source place
- 2.4. Should be set up shed against the snow in winter.
- 2.5. Barrier-free at the air inlet or outlet place.
- 2.6. Outlet against strong winds blowing place.
- 2.7. There should be drainage channels around the machine in order to rule out the condensate.
- 2.8. Control Panel, do not install in the bathroom, so as not to affect the unit work by wet.
- 2.9. Should leave enough space around the machine. As shown below.

A、 Side fan type installation space requirements:



B、 Top fan type installation space requirements:



3. hot water tank(water tank)and buffer tank(water tank) install location select

- 3.1. The water tank can be installed in the outdoor with heat pump outdoor unit, such as balconies, roofs, floors, also can be installed in the room.
- 3.2. Water tank must be standing install, the installation place is a solid foundation, must be bear the weight of the tank when full of water.
- 3.3. Around the water tank , as well as water pipes and hot water pipes should install a valve.
- 3.4. Do not install the water tank, where exist pollute and corrosive gases.

4. The unit and water tank installation

- 4.1. Unit install base is concrete structures, also can be made of steel angle brackets, plus vibration rubber pad placed on the ground or roof, to ensure the unit horizontally.
- 4.2. Installed base design should in accordance with units and water tanks installed size And operational quality.
- 4.3. Directly use expansion bolts to fix unit and water tank to the concrete base.
- 4.4. Around the unit and tank should be drain or outlet.

5. Installation of terminal equipment

- 5.1. Indoor terminal equipment installation (such as: fan coil, radiator heater or floor heating), the equipment should be installed in accordance with relevant regulatory requirements.
- 5.2. In accordance with the requirements of engineering design drawings, installation and construction.
- 5.3. Use a soft connector to connect the unit and fan coil inlet and outlet pipes; install fan coil condensate drain pipe, connect the condensate drain interface, and to ensure smooth drainage of condensate water.

6. Pipe connection

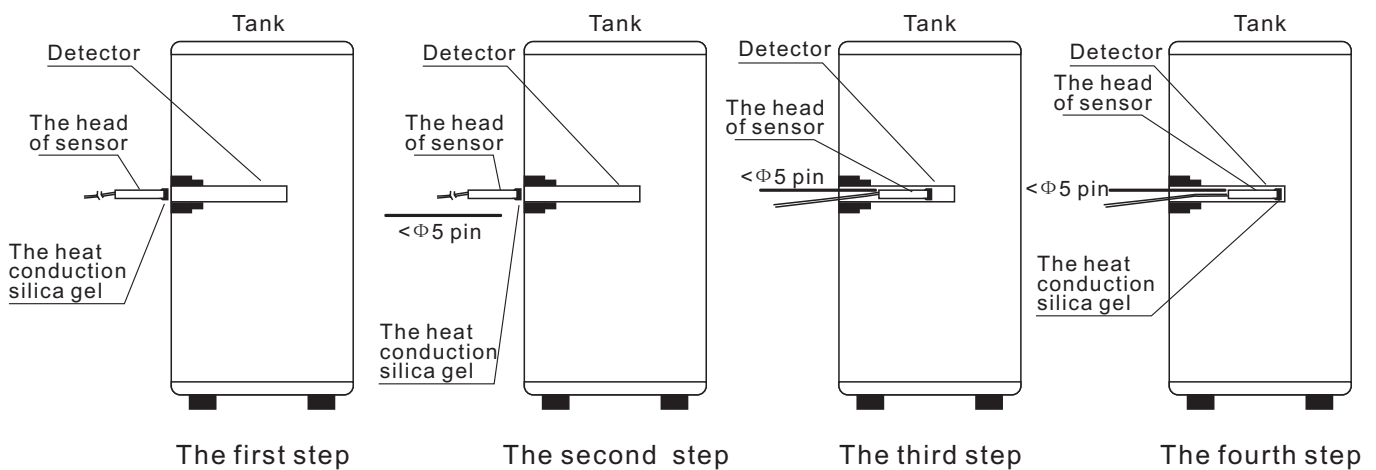
- 6.1. Pipe material selection, can be stainless steel pipe, copper pipe, aluminum water pipe, hot water PPR pipes and so on, according with national health and safety standards, heat-resistant, rust-proof, no scaling pipe.
- 6.2. The choice of pipe sizes can be used the one which matches the heat pump inlet and outlet main pipe, and, respectively connect to heat pump inlet and outlet, and follow the proper construction of plumbing standards.
- 6.3. Water tank outlet pipe and overflow pipe installed in the gutter or outlet position as far as possible, where convenient to drainage.
- 6.4. The unit and the junction to the tank must be installed valve or demolition loose joint, for maintenance use.
- 6.5. Water pipes are arranged reasonably to minimize bending and reduce the pressure loss of water system
- 6.6. The unit air-conditioning side and the hot water side circle inlet must be installed a above 50 mesh water filter to reduce the water system resistance loss.
- 6.7. The unit air-conditioning side and the hot water side which connect to running water must be installed a one-way valve, filter and pressure relief devices (pressure relief devices used on the closed water tank, water tank accessories in general, the parameter value $\leq 0.7\text{MPa}$), in accordance with the flow and valve arrow direction, to avoid flow be obstructed.
- 6.8. The unit hot water side circle outlet connect to tank circle inlet, and the host hot water side circle inlet connect to tank circle outlet, tank hot water supply connect to hot water pipe.
- 6.9. Air-conditioning side buffer tank in series installed on the outlet of the main pipe.
- 6.10. After hot water side and air-conditioning side water system pipes, circulated pipes, hot water supply pipes connected, it must be pipe connection rigorous testing , plus 0.7Mpa pressure testing 24 hours, system pipes connector no leakage and clean and sewage pipes, to ensure that the system clean, no debris. No leakage after the test, then pack the pipe and valve with insulation (including the replenishment pipes and valves).
- 6.11. In order to discharge the water system air clean, avoid air trapping in the pipeline, the water supply return pipe highest point should be set up a automatically exhaust valve.
- 6.12. The water system expansion tank, automatic water valve and stop valve should be installed indoors, to prevent water pipes and valves crack when not use in the winter.
- 6.13. The metal pipe must be used above 50mm thickness of glass fiber or high-density fire retardant PE for thermal insulation and moisture, PPR water pipe can be used 30mm thickness of glass fiber or high-density fire retardant PE for thermal insulation and moisture to prevent cold, heat loss and condensation.

6.14. The unit water inlet and outlet must install a thermometer, water pressure gage, to facilitate inspection when operate.

Note:

- 1) Tubing pipeline should be separate test pressure, must not test with hot water unit or tanks.
- 2) The Water system allows working pressure range: 0.2-0.7 MPa.
- 3) The Water system allows working temperature range: 5-75 °C.
- 4) Water can drain from the pressure relief device drainage pipe, and the pipe keep open to atmosphere.
- 5) The pressure relief device regularly move to remove the calcium carbonate, and prove that the device is not plugged.
- 6) Installation of one-way valves, filters and pressure relief device, valve body arrow as same as flow direction .
- 7) The pressure relief device discharge pipe should be installed in the frost-free environment in A continuous down way.

7. Installation of the temp detector



- 7.1. The first step: Daub the heat conduction silica gel spreads in the front of sensor, and insert into the detector.
- 7.2. The second step: use $\phi 5$ pin to push the detector into the end of the detector against the end of the sensor, and marks on level of the pin and the detector.
- 7.3. The third step: putout the pin, the position of mark to be at the same level with the inlet of detector, check whether the sensor is inserted to the pipe terminal.
- 7.4. The fourth step: the inlet of the detector is sealed with the glass silica gel, and keep the inlet of the detector upwards and uprightness about an hour.

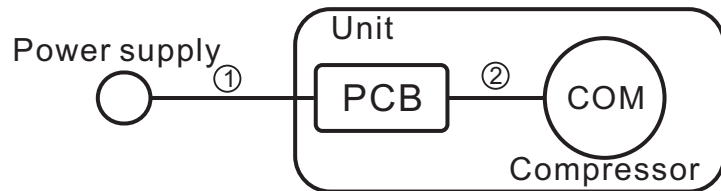
8. Electrical wiring

- 8.1. The unit should use dedicated power supply, power supply voltage line corresponding with rated voltage.
- 8.2. The unit power cable must use copper cable, the cable diameter must ensure that the unit's maximum starting current requirements.
- 8.3. The unit power supply circuit must have a grounding wire, which should connect with a reliable external ground wire, and the external ground wire is effective.

- 8.4. Wiring construction must be installed by professional technicians refer to circuit diagram.
- 8.5. Power lines and signal line layout should be neat, rational, strong and weak lines separate and can not interfere with each other, while not contacted with the connecting pipe and the valve body.
- 8.6. When power lines and control lines parallel, the wires were placed in each tube, also leave appropriate distance between the lines.
- 8.7. Unit electric wire connection: take the unit power line, remote control three core lines, electric heater power line, solar circulated water pump control power line, water tank temperature sensing line, solar collector temperature sensor line, terminal equipments connect to unit lines, through the unit wiring hole set into the electrical box, connect to the appropriate terminals according to wiring diagram, and fix it by the pressure line of board in the electrical box.
- 8.8. Unit control panel Code Mk3079, Fuse specifications: 5A/250V

9. Electrical Wire Selection

9.1. Voltage drop occur may due to the large current draw during compressor starting, and may be result in the compressor is difficult to stat. So we recommend selecting the wire specification from the table below.



9.2. Size Table of Electrical Wire

Starting current (A)	The wiring specifications (mm ²)						
	Markor 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.

9.3 Caution of Ground

The internal motor protector does not protect the compressor against all possible conditions. Please be sure that the system utilizes the ground connection when installed in the field.

9.4 Warning:

To avoid fire, electric shock and other accidents, keep in mind about these tips:

9.4.1. Only use power supply voltage indicated on the label, if you do not know the family of voltage, contact the dealer or local power company.

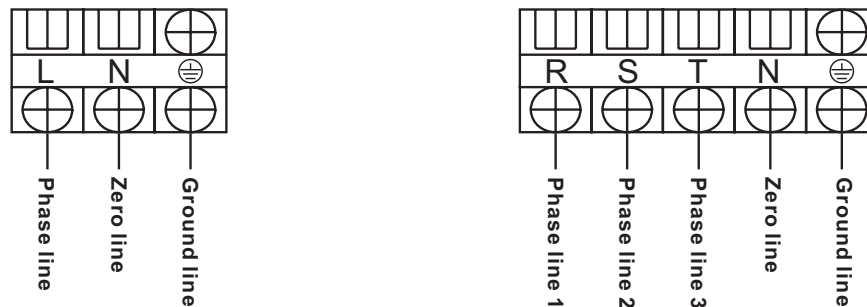
9.4.2. When you use the unit by the maximum current please view the specifications, so make sure your home's power supply (current, voltage and cable) to meet the machine's normal load Requirements.

9.4.3. To protect the power lines. Power lines should be fixed, so that people will not be trip over or the lines damaged by other things. Paying particular attention to plugs, which should be easily plug into the socket, careful the plug position.

9.4.4. Do not overload wall plugs or extension the cable. Line overload can cause fire or electric shock.

9.4.5. To ensure your safety, you must plug the power lines into the socket with a grounded three-phase, and check to ensure your socket is accurate and reliable grounding.

9.5. Power wiring as follows (single unit):



Mode	Host Power	Phase line	Zero line	Ground line	Max. line length (m)	Signal line	Tem. sensor assistance line	Max. line length (m)
050ZA/P(01)	220V/1PH/50Hz	6.0mm ²	6.0mm ²	2.5mm ²	15	0.5mm ²	0.5mm ²	50
080ZB/P(01)		10.0mm ²	10.0mm ²	2.5mm ²	15	0.5mm ²	0.5mm ²	50
100ZB/P(01)		10.0mm ²	10.0mm ²	2.5mm ²	15	0.5mm ²	0.5mm ²	50
040WA/PS(01)	380V/3PH/50Hz	2.5mm ²	2.5mm ²	2.5mm ²	15	0.5mm ²	0.5mm ²	50
080ZB/PS(01)		4.0mm ²	4.0mm ²	4.0mm ²	15	0.5mm ²	0.5mm ²	50
100ZB/PS(01)		6.0mm ²	4.0mm ²	4.0mm ²	15	0.5mm ²	0.5mm ²	50
150ZB/PS(01)		6.0mm ²	4.0mm ²	4.0mm ²	15	0.5mm ²	0.5mm ²	50
200ZB/PS(01)		10.0mm ²	4.0mm ²	4.0mm ²	15	0.5mm ²	0.5mm ²	50

Note:

1. used PVC insulated copper wire for above wiring
2. for installation requires, the line is longer than the maximum line length, please contact the company

10.Trial operation(should be operated by professionals)

10.1 Check before trial operation

- 10.1a Check the pipe system. Check the whole pipe system. Ensure the water volume in the system is full and the air is exhausted completely. Check whether the valve is open throughout the system and the thermal insulating of the pipe is well.
- 10.1b Check the power supply and distribution system. Check whether the power supply voltage is normal, the power distribution accessory screws all tighten, supply power is in compliance with the wiring diagram and the wire is grounded well.
- 10.1c Check the air cooled water chiller. Check whether any screw loose. Check the signal indicator light(green) of the outdoor unit control panel is illuminated normally and the fault indicating lamp(red) is illuminated. Connect the pressure gauge to the freon feed mouth for checking the pressure during operation. Disconnect them after test is ok.

10.2 Trial operation

- 10.2a Turn on the circulating water pump by remote control(refer to “III、Use”) and check whether the water pump operates normally. Observe and determine whether air pipe is exhausted completely, flow switch is closed, hydraulic pressure indicated in the pressure gauge is more than 0.2MPa.Come to next step after confirm the circulating water system works normally.
- 10.2b Press “on/off” in the remote controller, the water pump and fan start immediately. The compressor start after the unit operates for some time. Observe and determine if there’ s any abnormal sound during operation. Stop to check the unit if there’ s abnormal sound. The unit can continue to run only when there’ s no abnormal sound. Check whether the cooling system pressure is normal at the same time.
- 10.2c Check whether the input power and current of the unit are compliance with the parameter in this Instruction. If not, stop to check the unit.
- 10.2d Observe whether the outlet water temperature is normal.
- 10.2e Parameter of the remote controller has been set before leave of the factory. Never alternate them personally.

III. USE

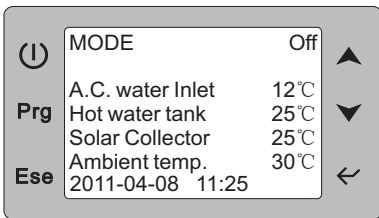
1. Remote controller interface displays as below



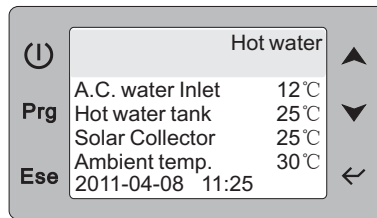
	UNIT ON/OFF	Press this button to control the unit's ON or OFF
Prg	SET	Press this button to enter the main menu interface
Ese	BACK	Press this button to return to the previous screen
	UP	Modify the parameter values or turn to next page
	DOWN	Modification parameter values or turn to next page
	ENTER	Press this button and enter the next parameters interface or enter parameters modification state, and confirm the modification

2. Operation and display

2.1 . Power on(off)/mode display status



Power off

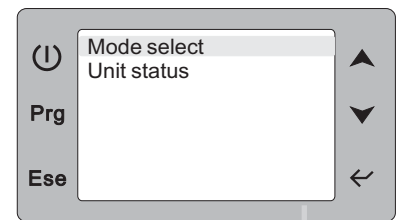
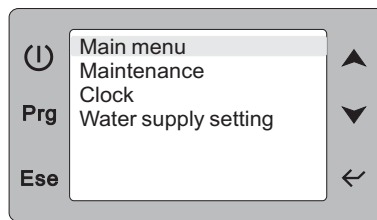
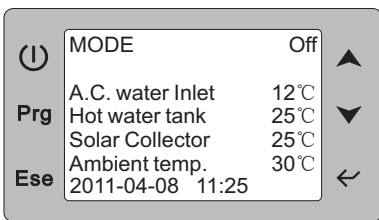


Power on

2.2 Mode of operation

Under the main interface, press: " Prg " enter into parameter setting interface, choose "main menu", press " ← " button, choose "Mode select", press " ← " into the mode setting, press " ▲ ▼ " to view and choose, press " ← " again to go into the modify parameter interface, the corresponding parameter value is flashing, press " ▲ ▼ " to modify the value, press " Ese " return to the previous menu.

(E.g)



Press " Prg " button

Press " ← " button

Press " ← " button you can change the running mode

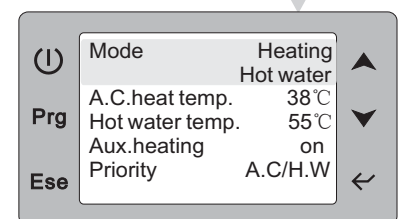
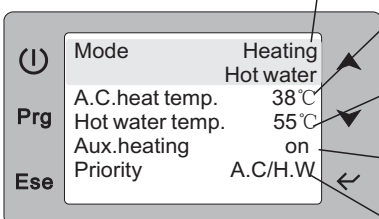
Press " ← " button you can change the set heating temp.

Press " ← " button you can change the set hot water temp.

Press " ← " button you can turn on/off auxiliary electric heater

Press " ← " button you can choose the priority of air condition or hot water.

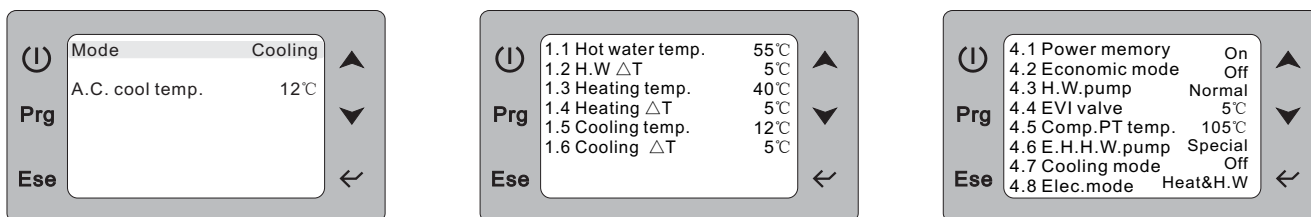
Press " ← " button again



2.3 Mode introduction

There are six selection modes, the following is the mode of display and introduction

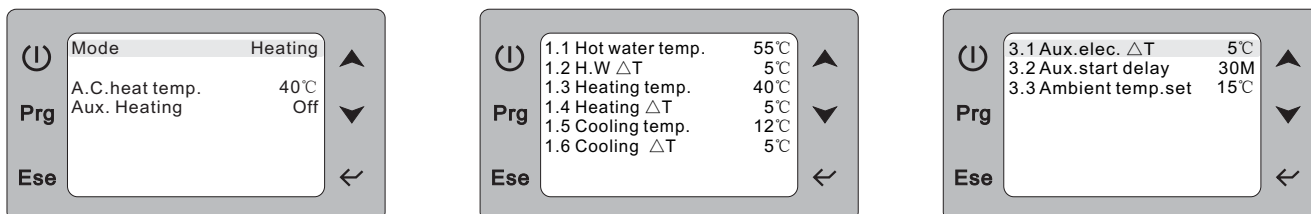
● Cooling mode



The parameter setting of cooling mode

- 1.Parameter 1.5 under air condition side cooling mode,the setting of water inlet temperature .
- 2.Parameter1.6 under air condition side cooling mode,the compressor restart difference temperature.
- 3.Parameter4.7 whether open the cooling function to the user interface
On:open Off: don't open

● Heating mode



The parameter setting of Heating mode

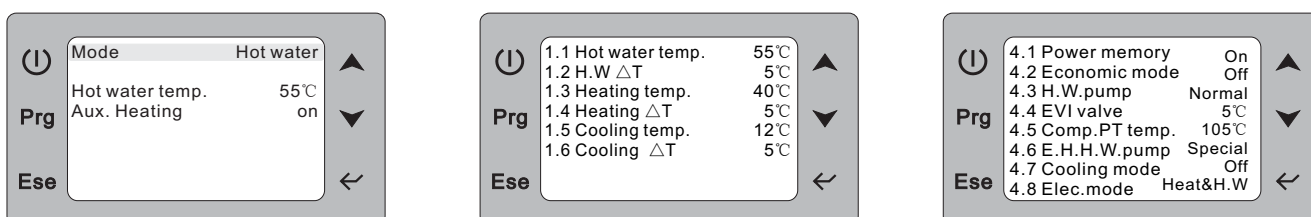
- 1.Parameter 1.3 under air condition side heating mode,the setting of water inlet temperature .
- 2.Parameter 1.4 under air condition side heating mode,the compressor restart difference temperature.
- 3.Note: when Aux.heating is ON, and the electric heater also meet the requirement of parameter3.1~3.3, so then the electric heater can work.

Parameter 3.1 :Under hot water electric heating mode, the electric heating restart difference temperature.

Parameter 3.2: Auxiliary electric heater start delay time (the time to delay after unit power on, the electric heater allows to output).

Parameter 3.3:The auxiliary electric heater start ambient temperature(When the ambient temperature is below the set temperature, the electric heating allows the output) .

● Hot water mode



The parameter setting of hot water mode

1.Parameter 1.1 the setting temperature of hot water.

2.Parameter1.2 hot water mode,the compressor restart difference temperature.

3.Parameter4.3 hot water cycle pump working mode option.

Special:hot water tank temp. reaches the set temperature, the hot water cycle pump keep working.

Normal:hot water tank temp. reaches the set temperature, the hot water cycle pump stop working.

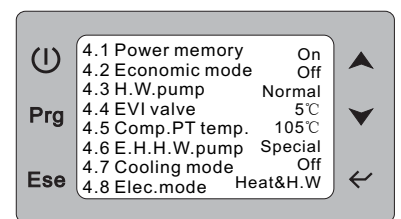
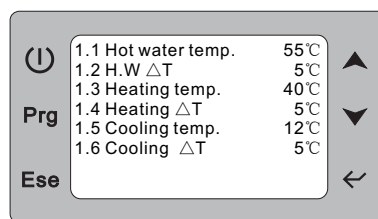
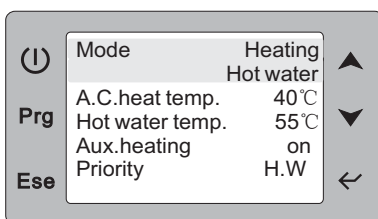
4.Note: when Aux.heating is ON, and the electric heater also meet the requirement of parameter3.1~3.3, so then the electric heater can work.

Parameter 3.1 :Under hot water electric heating mode, the electric heating restart difference temperature.

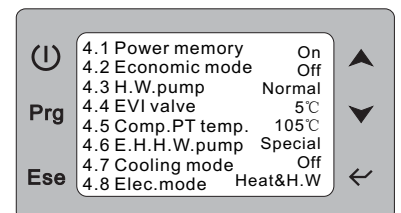
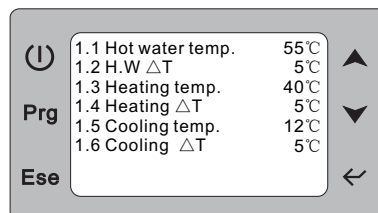
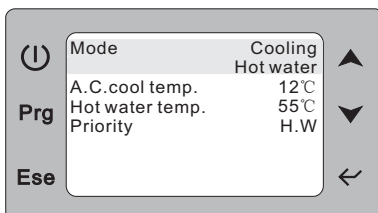
Parameter 3.2: Auxiliary electric heater start delay time (the time to delay after unit power on, the electric heater allows to output).

Parameter 3.3:The auxiliary electric heater start ambient temperature(When the ambient temperature is below the set temperature, the electric heating allows the output) .

● Heating+Hot water mode



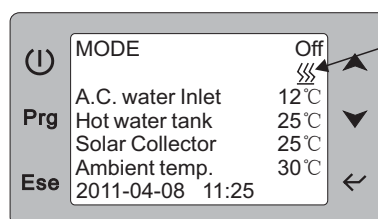
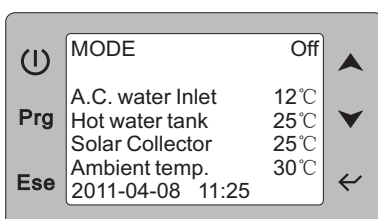
● Cooling+Hot water mode



Note:Parameter4.7 whether open the cooling function to the user interface

On:open Off: don't open

● Manual operation electric heater mode



Legend:

This icon means the manual electric heating model is in operation

Press “ ← ” button for 5 s
(turn on the mode)

The parameter setting of Manual operation electric heater mode

1.Parameter4.6 when the unit running manual electric heating mode the hot water cycle pump working way.

Special:the hot water cycle pump required output.

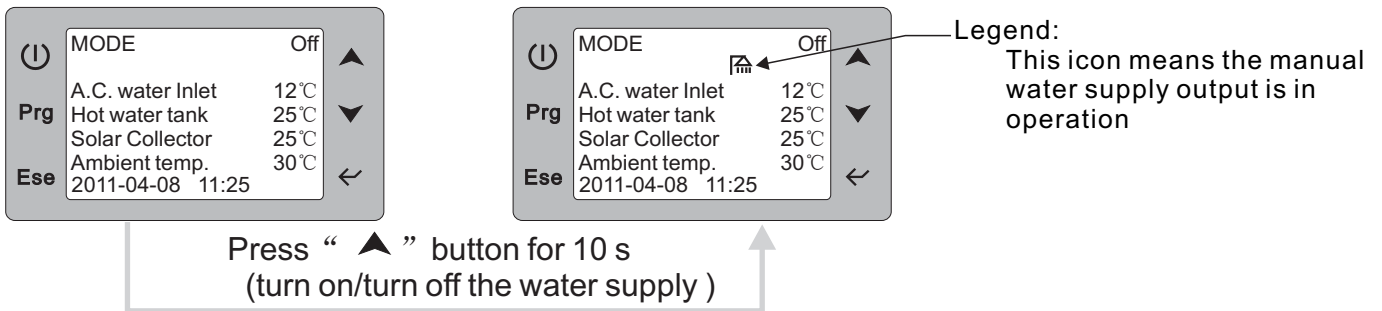
Normal:the hot water cycle pump not required output.

2.Parameter4.8 the application of manual electric heater

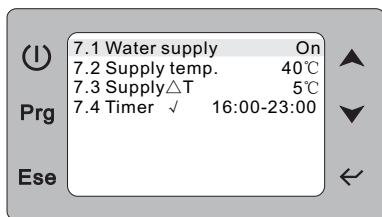
Heat: air condition heating auxiliary electric heater

Heat&H.W: air condition heating and hot water auxiliary electric heater

Manual operation water supply function



Automatic water supply function



Parameter 7.1 whether turn on the automatic constant temp. water supply function, ON means turn on (work with parameter 7.4,) OFF means turn off

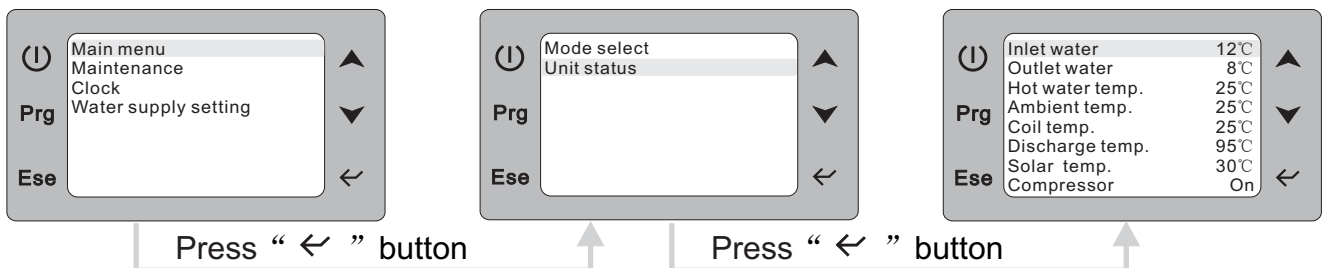
Parameter 7.2 the water supply return temp. setting

Parameter 7.3 the temp. difference between the water supply return temp. and the setting temp.

Parameter 7.4 the automatic constant temp. water supply time setting (work with parameter 7.1)

3.System State parameter checking:

On the main interface,press “Prg” enter into parameter setting interface,choose "Main menu "press “←” button,choose "Unit status",press “←” into the mode setting,press “▲▼” to view the paramter, press “Ese” return to the previous menu.



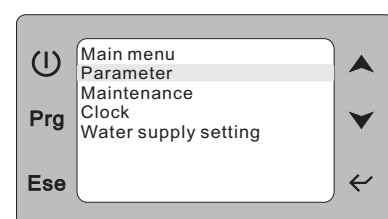
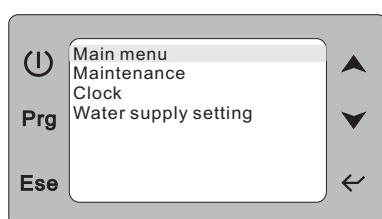
Unit State parameters

Display	Status	Means
Inlet water	12°C	Water inlet temp.
Outlet water	8°C	Water outlet temp.
Hot water temp.	25°C	Hot water tank temp.
Ambient temp.	28°C	Ambient temp.
Coil 1temp.	25°C	System 1 coil temp.
Coil 2temp.	25°C	System 2 coil temp.

Display	Status	Means
Discharge 1 temp.	85°C	System 1 discharge temp.
Discharge 2 temp.	85°C	System 2 discharge temp.
Solar temp.	30°C	Solar collector temp.
Return temp.	40°C	Water supply return temp.
Compressor 1	On	System 1 compressor On/off
Compressor 2	On	System 2 compressor On/off
4way-valve	On	System 4-way valve on/off
H.W.pump	On	Hot water pump On/off
A.C. Pump	On	Air condition water pump on/off
Solar pump	On	Solar water cycle pump on/off
Fan motor	On	Fan motor on/off
3way-valve	On	3-way valve on/off
Aux.electric	On	Auxiliary electric heater on/off
Unload valve	On	System unload valve on/off
EVI valve	On	System EVI valve on/off
Supply output	On	Supply output on/off
H.W.flow sw	Close	Hot water side water flow switch
A.C.flow sw	Close	Air condition side water flow switch
Sys.1 HP sw	Close	System 1 high pressure switch
Sys.1LP sw	Close	System 1 low pressure switch
Sys.2 HP sw	Close	System 2 high pressure switch
Sys.2 LP sw	Close	System 2 low pressure switch
On/off sw	Close	Unit turn on/off switch
Mode sw	Close	Unit mode switch
Electric sw	Open	Turn on/off auxiliary electric mode
A.C.on/off sw	Close	Air condition turn on/off switch
Phase PT sw	Close	Power phase protection
Aux.elec.PT sw	Close	Auxiliary electric protection switch

4. System parameter setting:

On the main interface, press the button “ Prg ” enter into page2 (picture 1), press “ Prg ” for 5 second until hear the “beep” , one more parameter (parameter) appear, press “ ▲ ▼ ” to view the parameter, choose “Parameter” and press “ ← ” to enter the parameters setting interface, press “ ▲ ▼ ” to view the parameter, press “ ← ” to enter the parameters setting interface, press “ ▲ ▼ ” to view the parameter, press “ ← ” to enter the system parameters setting interface, corresponding parameter flashing, press “ ▲ ▼ ” to modify, press “ Ese ” to return previous menu.



Press “ Prg ” button for 5 second until hear the “beep”

4.1 Detailed description of the function parameters

Parameters 1.0 select “Temp.setting”

⏻	1.1 Hot water temp.	55°C	▲
	1.2 H.W. ΔT	5°C	
Prg	1.3 Heating temp.	40°C	▼
	1.4 Heating ΔT	5°C	
	1.5 Cooling temp.	12°C	
Ese	1.6 Cooling ΔT	5°C	←

Parameter 1.1: Under hot water mode the setting of water tank temperature.

Parameter 1.2: Under hot water mode, the compressor restart difference temperature.

Parameter 1.3: Under heating mode, the setting of water inlet temperature .

Parameter 1.4: Under heating mode, the compressor restart difference temperature.

Parameter 1.5: Under Cooling mode, the setting of water inlet temperature .

Parameter 1.6: Under Cooling mode, the compressor restart difference temperature.

Parameters 2.0 select “Defrost”

⏻	2.1 Def. cycle	40M	▲
	2.2 Def. inlet temp.	-7°C	
Prg	2.3 Def. outlet temp.	13°C	▼
	2.4 Def. max. time	8M	
Ese			←

Parameter 2.1: Cycle defrost cycle time setting.

Parameter 2.2: Into the defrost state conditions. When the coil temperature is below this parameter setting, the conditions are met.

parameter 2.3: Exit defrost state condition 1, when the coil temperature is higher than the set value of this parameter, the condition is met.

parameter 2.4: out defrost state condition 2, when the defrost time is running larger than this parameter setting the time, conditions are met.

Parameters 3.0 select “Aux-heating”

⏻	3.2 Aux.start delay	30M	▲
	3.3 Ambient temp.set	15°C	
Prg			▼
Ese			←

Parameter 3.1: The auxiliary electric heater restart difference temperature.

Parameter 3.2: Auxiliary electric heater start delay time (the time to delay after unit power on, the electric heater allows to output).

Parameter 3.3: The auxiliary electric heater start ambient temperature (When the ambient temperature is below the set temperature, the electric heating allows the output) .

Parameters 4.0 select “Systems”

⏻	4.1 Power memory	On	▲
	4.2 Economic mode	Off	
	4.3 H.W.pump	Normal	
Prg	4.4 EVI valve	5°C	▼
	4.5 Comp.PT temp.	105°C	
	4.6 E.H.H.W.pump	Special	
	4.7 Cooling mode	Off	
Ese	4.8 Elec.mode	Heat&H.W	←

Parameter 4.1: Power-down memory options parameters.

On: with memory Off: without memory

Parameter 4.2: Whether turn on the economic mode.

Parameter 4.3: Hot water cycle pump working way.

Normal: when the hot water tank temperature reach the setting temperature the hot water pump stop working.

Special: when the hot water tank temperature reach the setting temperature the hot water pump keep working.

Parameter 4.4: The setting of ambient temperature to turn on the EVI valve.

Parameter 4.5: Compressor discharge temperature too high protection exhaust temperature setting.

Parameter 4.6 When the unit running manual electric heating mode the hot water cycle pump working way.

Special: the hot water cycle pump required output.

Normal: the hot water cycle pump not required output.

Parameter 4.7 Whether open the cooling function to the user interface

On: open Off: don't open

Parameter 4.8 The application of manual electric heater

Heat: air condition heating auxiliary electric heater

Heat+H.W: air condition heating and hot water auxiliary electric heater

Parameter 4.9 System number select

1: single system 2: double system

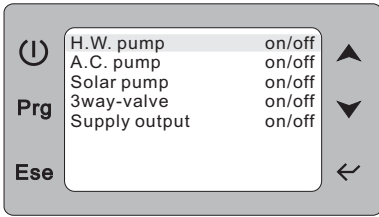
Parameter 4.10 Unit stop temp. (the temp. setting of ambient temp. too low protection)

Parameters 5.0 select “Solar setting”

⏻	5.1 Solar start ΔT	6°C	▲
	5.2 Solar stop ΔT		
Prg			▼
Ese			←

Parameter 5.1: Solar pump starts difference temperature set. The difference temperature of solar collectors measured values and hot water tank measured temperature.

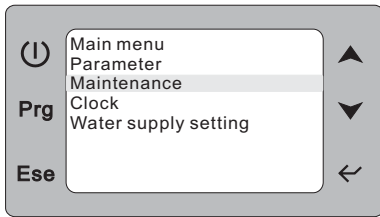
Parameters 6.0 select “Water pump testing”



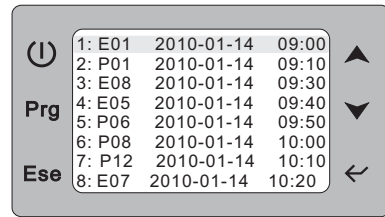
Parameter 6.0: This parameter is used by engineers debugging parameters, you can manually open the air-conditioning pumps, water pumps, solar water pump 3way-valve and supply output parameter.

5. The maintenance time inquires

In the interface ,press “ Prg ” to enter parameter setting interface,choose "Maintenance" and press “ ← ” to enter Maintenance time inquires, press “ ▲ ▼ ” to turn a choice, and press “ Ese” key returns the last menu.



Picture1



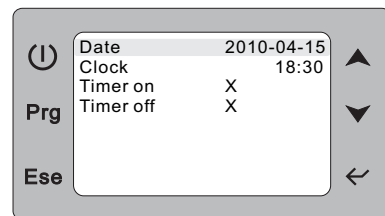
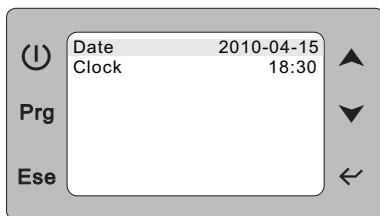
Picture2

NOTE:In the picture 2 interface,press the “ prg ” button for 5 seconds ,the fault record will remove.

6. Date/ time/ timing on and off settings

In the main interface, press “Prg ” key to enter the parameter setting interface, select Clock, press “ ← ” key to enter the time setting / timing on or off interface, press the “ ▲ ▼ ” key to turn options:

Note: Press “ Prg ” button for 5 seconds, when you hear the “beep” sound, you can see the page to add Timer on and Timer off select column.



Press “ Prg ” button for 5 second until hear the “beep”

6.1 . When you select "Date", press “ ← ” key, the date of the year setting flash, press the “ ▲ ▼ ” key to modify Year, then press “ ← ” key again, the month setting flash,press the “ ▲ ▼ ” key to modify the month, click the “ ← ” key again, Day flash, press the “▲ ▼ ” key to modify the day, then press “ ← ” key to confirm and exit, press the “ Ese ” button to return the layer menu.

6.2. When you select "Clock", press the “ ← ” key, the time hourly position flash, press the “▲ ▼ ” key to modify hour value, then press “ ← ” key, minutes flash, press the “▲ ▼ ” key to modify the minute value, press the “ ← ” key again confirm and exit, press the “ Ese ” to return the layer menu.

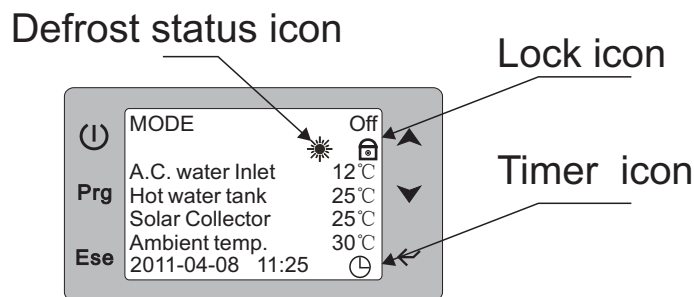
6.3. When you select "Timer on", press the “←” key, regular on or off setting flash, press “▲▼” key to modify the boot time whether on / off, appear "√" symbol when choose on, and show regular boot time settings, click the “←” key, regular on or off hour value setting flash, press the “▲▼” key to modify the value, then press “←” key, regular on or off minute value setting flash, press “▲▼” key to modify the value, press “←” key to confirm and exit, press the “Ese” "Ese" to return the layer menu.

7. Lock button/Defrost status/ “Fahrenheit” and “Celsius” change:

A: Display Lock: Under the main interface :Press “Prg” for 5s, the interface will show the “🔒” icon as shown in figure .then, all buttons on the display are locked, but it can be unlocked after pressing “Prg” for 5s again.

B:Defrost status :When the unit are running heating or hot water mode, if the main interface is showing the “❄️” icon as shown in figure ,that means the unit are running the defrost status

C: “Fahrenheit” and “Celsius” change: Under the Celsius status, press “Ese” for 10 s can changed “Fahrenheit” ,it will change to Celsius again when press “Ese” for 10s.



8. Fault code display

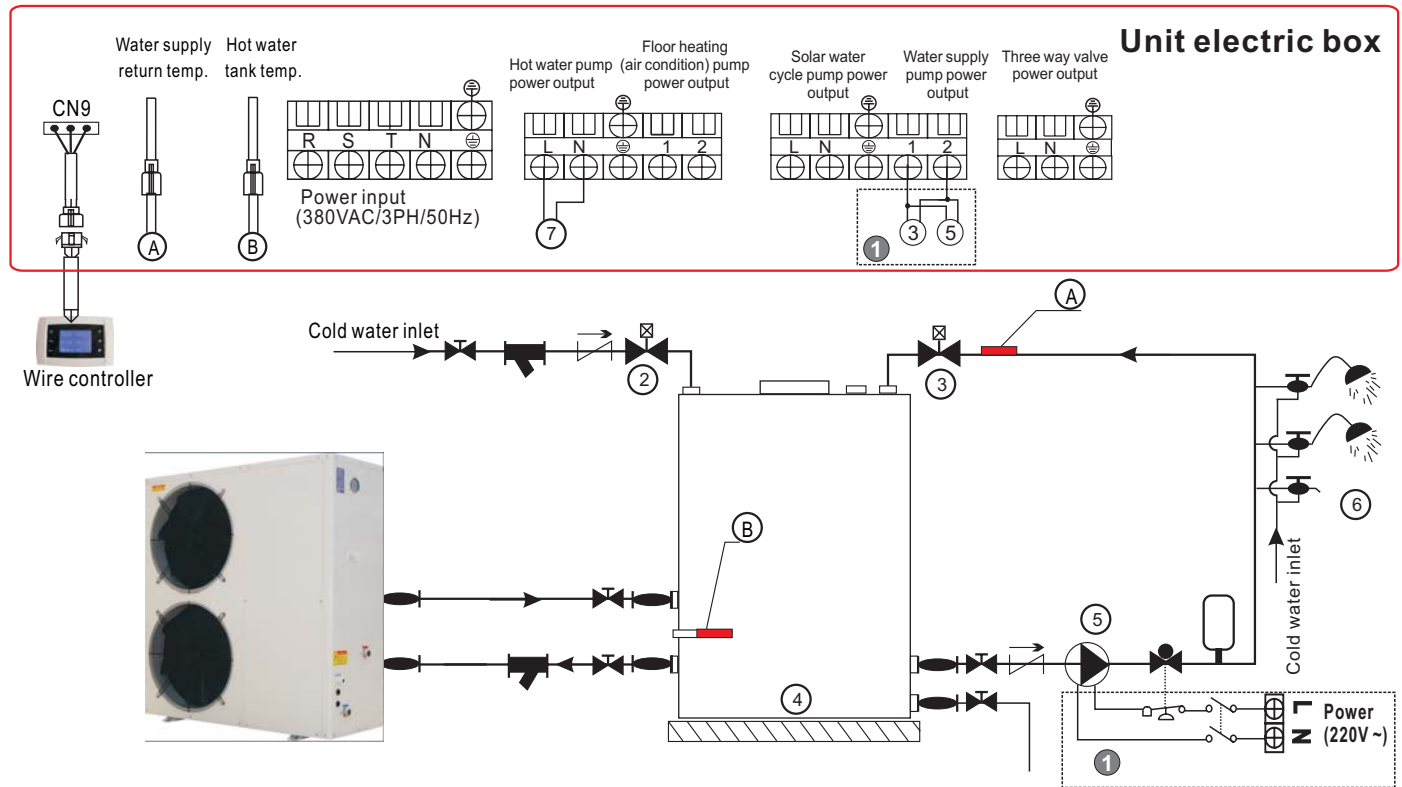
When a fault, unit controller display automatically corresponding fault code and the fault reasons. When fault resolution, fault display automatically eliminate or after re-power to eliminate.

9. Parameter Table

Display code1	Display code2	Setting data explanation or working state	Parameter setting range	Default	Remarks
Parameter					
1.0 Temp.setting	1.1 Hot water temp.	The setting temp.of hot water mode	10℃ ~60℃	55℃	Adjustable
	1.2 H.W. ΔT	Hot water mode,the compressor restart difference temperature	1℃ ~15℃	5℃	Adjustable
	1.3 Heating temp.	The setting temp.of heating mode	15℃ ~60℃	40℃	Adjustable
	1.4 Heating ΔT	Heating mode,the compressor restart difference temperature	1℃ ~15℃	5℃	Adjustable
	1.5 Cooling temp.	The setting temp.of cooling mode	8℃ ~28℃	12℃	Adjustable
	1.6 Cooling ΔT	Cooling mode,the compressor restart difference temperature	1℃ ~15℃	5℃	Adjustable
2.0 Defrost	2.1 Def. Cycle	defrosting cycle setting	30min~90min	40min	Adjustable
	2.2 Def. inlet temp.	Start defrosting coil temperature setting	-30℃-0℃	-7℃	Adjustable
	2.3 Def. outlet temp.	Exit defrost temperature setting	1℃ ~30℃	13℃	Adjustable
	2.4 Def. Max. Time	Defrost time setting	1min~12min	8min	Adjustable
3.0 Aux-heating	3.1 Aux.elec. ΔT	Auxiliary electric heating mode, the electric restart difference temp.	1℃ ~15℃	5℃	Adjustable
	3.2 Aux.start delay	Auxiliary electric heater start delay	3min~90min	30min	Adjustable
	3.3 Ambient temp.set	Auxiliary electric heater start to work when ambient temperature lower than the setting value	-20℃ ~45℃	15℃	Adjustable
4.0 Systems	4.1 Power memory	Power-down memory options parameters.	ON/OFF	ON	ON: with OFF: without
	4.2 Economic mode	Whether turn on the economic mode parameters.	ON/OFF	OFF	ON: automatic OFF: manual
	4.3 H.W.pump	Hot water pump working way	Special/Normal	Special	Special: turn on Normal: turn off
	4.4 EVI valve	The setting of turn on EVI valve (effective for the EVI unit)	-20℃~ 30℃	5℃	Adjustment
	4.5 Comp.PT temp.	Compressor discharge temp.too high protection setting.	30℃~ 125℃	105℃	Adjustment
	4.6 E.H.H.W.pump	Electric heating mode, hot water pump working way.	Special/Normal	Special	Adjustment
	4.7 Cooling mode	Wether open the cooling function to the interface of user	ON/OFF	Off	Adjustment
	4.8 Elec.mode	The use of manual electric heating mode	Heat/Heat&H.W	Heat&H.W	Adjustment
	4.9 System number	System number select	1:signle system 2:double system	1	Adjustment
	4.10 Unit stop temp.	The temp.setting of ambient temp. Too low protection	-30℃~ 10℃	-15℃	Adjustment
5.0 Solar setting	5.1 Solar start ΔT	Solar start temperature difference setting	1℃~ 20℃	6℃	Adjustment
6.0 Water pump testing	H.W. Pump	Hot water pump testing	ON/OFF	OFF	Adjustment
	A.C. pump	Air conditioner pump testing	ON/OFF	OFF	Adjustment
	Solar pump	Solar pump testing	ON/OFF	OFF	Adjustment
	3way-valve	3way-valve testing	ON/OFF	OFF	Adjustment
	Supply output	Supply output testing	ON/OFF	OFF	Adjustment
7.0 Water supply testing	Water supply	Turn on /turn off the automatic water supply function	On: turn on Off: turn off	OFF	Adjustment
	Supply temp.	The setting temperature of water supply return temp.	30℃~ 55℃	40℃	Adjustment
	Supply ΔT	The water supply pump restart work difference temperature	2℃~ 30℃	5℃	Adjustment
	Timer	The automatic water supply function time setting	00:00~ 24:00	✕	Adjustment

IV. Installation sketch

1. Hot water mode installation drawing



Legend:

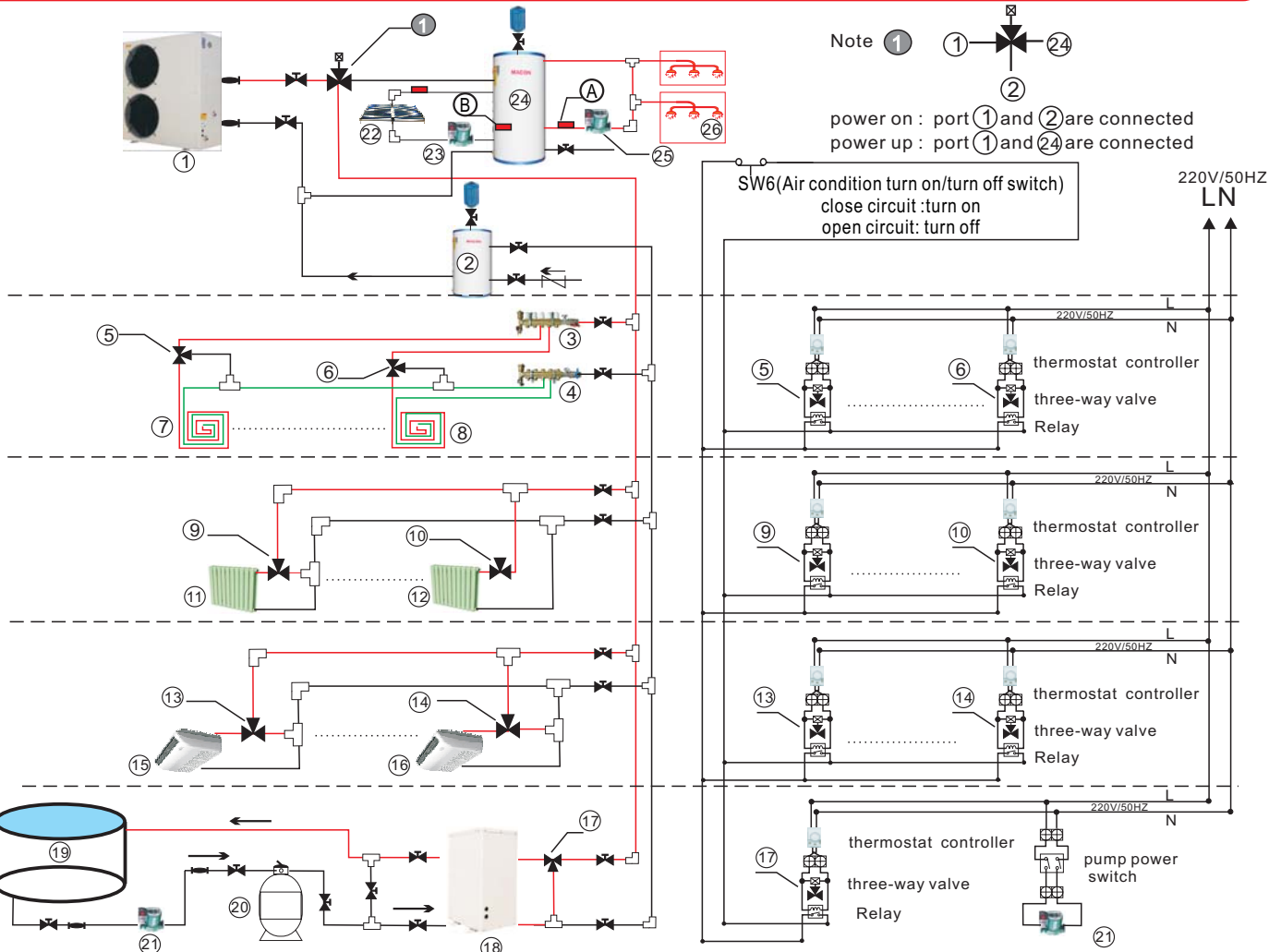
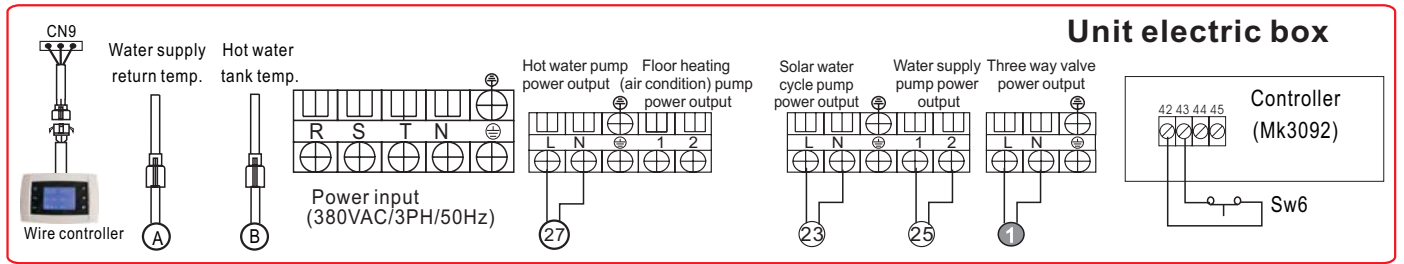
	Globe valves		Shower head	(A)	Water supply return temp.
	Electric driven two-way valve	(1)	Unit	(B)	Hot water tank temp.
	Check valve	(2)	Water filling valve		
	Water pressure switch	(3)	Water supply return valve		
	Air-break switch	(4)	Open wide type hot water tank		
	Water temp. sensor	(5)	Water supply cycle pump		
	Expansion Tank	(6)	Bath room		
		(7)	Hot water cycle pump		

The parameter setting for domestic hot water model:

Parameter				
1.1 Hot water temp.	The setting temp.of hot water mode	10°C ~60°C	55°C	Adjustable
1.2 H.W. ΔT	Hot water mode,the compressor restart difference temperature	1°C ~15°C	5°C	Adjustable
4.3 H.W.pump	Hot water pump working way	Special/Normal	Normal	Special: turn on Normal: turn off
7.1 Water supply	Turn on /turn off the automatic water supply function	On: turn on Off: turn off	On	Adjustable
7.2 Supply temp.	The setting temperature of water supply return temp.	30°C ~ 55°C	40°C	Adjustable
7.3 SupplyΔT	The water supply pump restart work difference temperature	2°C ~ 30°C	5°C	Adjustable
7.4 Timer	The automatic water supply function time setting	00:00~ 24:00	16:00~ 23:00	Adjustable

NOTE ①:When the water supply system with water pressure switch , use the water pressure switch control water supply pump independently , as shown in figure, if do not installed water pressure switch ,then connect the water supply pump to water supply output port

3. Hot water & Heating mode Hot water & cooling mode installation drawing



- | | | |
|-------------------------------|-----------------------------------|--|
| Flexible connectors | ⑤ Room 1 electric three way valve | ①⑦ Swimming pool three-way valve |
| Globe valves | ⑥ Room 2 electric three way valve | ①⑧ Water to water exchange |
| Electric driven two-way valve | ⑦ Room 1 floor heating | ①⑨ Swimming pool |
| Electric three-way valve | ⑧ Room 2 floor heating | ①⑩ Sand cylinder filter |
| Check valve | ⑨ Room 3 electric three way valve | ①⑪ Swimming pool side water cycle pump |
| Thermostat | ⑩ Room 4 electric three way valve | ①⑫ Solar |
| Expansion Tank | ⑪ Room 3 Radiators | ①⑬ Solar water pump |
| Hot water cycle pump | ⑫ Room 4 Radiators | ①⑭ Hot water tank |
| ① Unit | ⑬ Room 5 electric three-way valve | ①⑮ Water supply pump |
| ② Buffer tank | ⑭ Room 6 electric three-way valve | ①⑯ Bath room |
| ③ Water distribution device | ⑮ Room 5 fan coil | ①⑰ Hot water cycle pump |
| ④ Water collection device | ⑯ Room 6 fan coil | |

V.Maintenance and repair

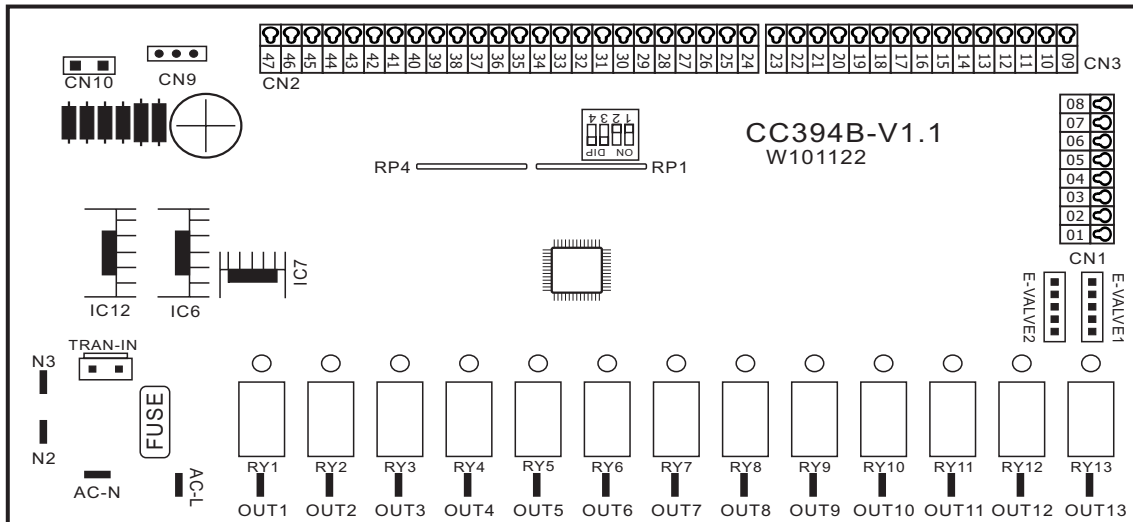
1.Malfunction Indicating Table. Determine and solve the malfunction by malfunction code as below:

1.1.operate display fault code mode:

Wire Controller	Malfunction	Reason	Resolution
E01	Hot water tank temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
E02	Water inlet temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
E03	Water outlet temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
E04	System1 Coil sensor failure	The sensor is open or short circuit	Check or change the sensor
E05	System 2 Coil sensor failure	The sensor is open or short circuit	Check or change the sensor
E06	Outdoor environment temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
E07	Water supply return temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
E08	System 1 discharge sensor failure	The sensor is open or short circuit	Check or change the sensor
E09	System 2 discharge sensor failure	The sensor is open or short circuit	Check or change the sensor
E10	Communication failure	Wire controller and The PCB connection failure.	Check the wire connection
E11	Solar collector temp. Sensor failure	The sensor is open or short circuit	Check or change the sensor
P01	Phase failure protection	Power supply phase failure /lacking	Check whether power supply phase failure or lacking, if failure, please connect it in according to the proper way.
P02	Electric heater auxiliary overheating & dry heating protection	The overheat protection is opened	Check whether the water flow and electric heating is working normal then push the reset button on the overheat protection switch.
P03	Hot water flow switch protection	No water/little water in water system.	Check the water flow volume, water pump is failure or not.
P04	Air condition (Floor heating) side water flow switch protection	No water/little water in water system.	Check the water flow volume, water pump is failure or not.
P05	System 1 high pressure protection	System 1 high pressure switch protection	Check whether the pressure switch and system return route failure.
P06	System 1 low pressure protection	System 1 low pressure switch protection	Check whether the pressure switch and system return route failure.
P07	System 2 high pressure protection	System 2 high pressure switch protection	Check whether the pressure switch and system return route failure.
P08	System 2 low pressure protection	System 2 low pressure switch protection	Check whether the pressure switch and system return route failure.
P09	3 times of excessive temp. differentials of inlet water and outlet water in 30minutes	Water flow volume not enough, water pressure difference is too low	Check the water flow volume, or water system is blocked or not.
P10	Antifreezing protection in winter	when the outdoor temp. below 0℃ under standby model	after the antifreezing procedure ,unit will return to the original state automatically
P11	System 1 discharge temp. too high protection	1.whether gas of system leak or not 2.the tank temp. Be set too high	1 check the refrigerent amount in the system 2 check whether the tank temp. Setting value too high
P12	System 2 discharge temp. too high protection	1.whether gas of system leak or not 2.the tank temp. Be set too high	1 check the refrigerent amount in the system 2 check whether the tank temp. Setting value too high

VI. Wiring diagram

1. Mk3092 PCB input and output port definition

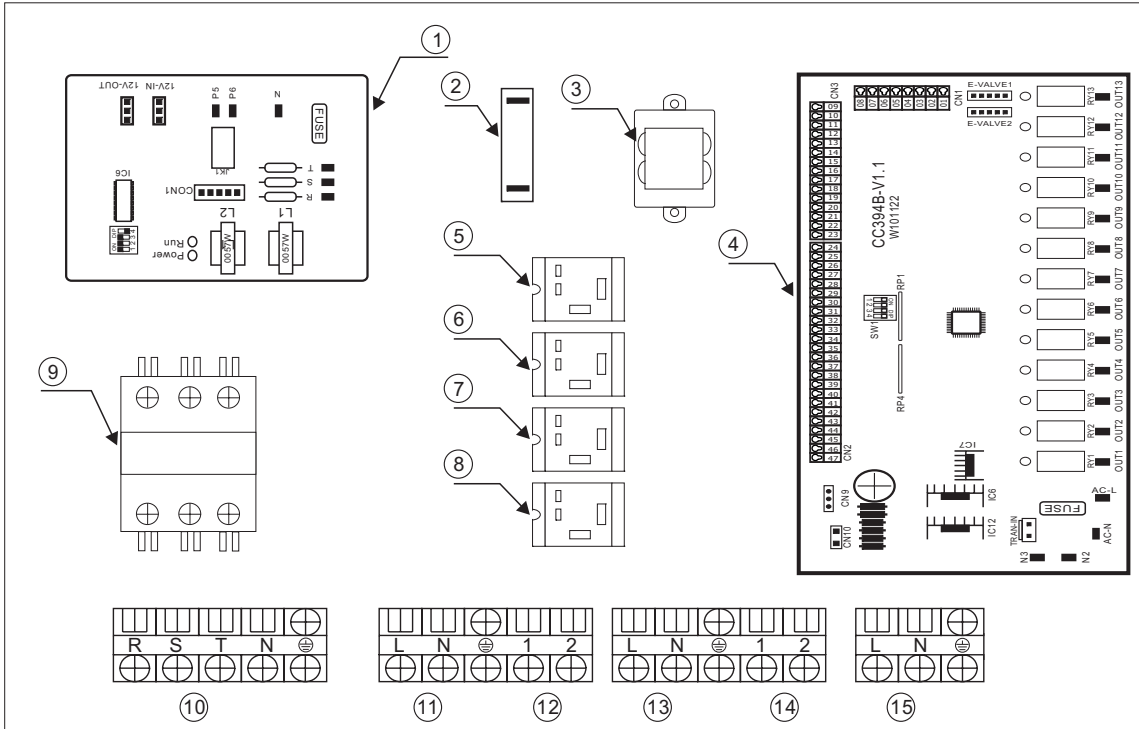


NO.	Symbol	Meaning	NO.	Symbol	Meaning
01	CN1	System 1 coil temp.	34	CN2	Hot water flow switch
02		GND	35		GND
03		System 1 discharge temp.	36		Air condition side water flow switch
04		GND	37		GND
05		System 2 coil temp.	38		System 2 high-pressure switch
06		GND	39		GND
07		System 2 discharge temp.	40		System 2 low-pressure switch
08		GND	41		GND
09	CN3	GND	42		Hot water electric heating protection switch
10		Water supply return water temp.	43		GND
11		GND	44		Turn on/off air heating/cooling switch ④
12		Outlet water temp.	45		GND
13		GND	46		Phase sequence protection
14		Inlet water temp.	47	GND	
15		GND		OUT1	Compressor of system 1
16		Solar collector temp.		OUT2	Compressor of system 2
17		GND		OUT3	Fan motor
18		Ambient temp.		OUT4	Unload valve
19		GND		OUT5	4 way valve 1
20	Hot water tank temp.		OUT6	Hot water cycle pump	
21	GND		OUT7	Floor heating(air condition) water cycle pump	
22	Reservation		OUT8	Solar water cycle pump	
23	GND		OUT9	Hot water auxiliary electric heating	
24	CN2	Turn on/turn off switch ③	OUT10	Three-way valve	
25		GND	OUT11	EVI valve(effective for the EVI unit)	
26		Mode switch ②	OUT12	Compressor crankshaft heater	
27		GND	OUT13	Water supply output	
28		Turn on/off aux.ele heater switch ①	AC-L	Power Input	
29		GND	AC-N	Power Input	
30		System 1 high-pressure switch	N2	Power Input(AC-N)	
31		GND	N3	Power Input(AC-N)	
32		System 1 low-pressure switch	TRAN-IN	Transformer input	
33		GND	CN9	Wire controller	
		CN10	Transformer output		

- NOTE ① : Closed circuit: turn on the manual electric heater mode.
Open circuit : turn off the manual electric heater mode
- NOTE ② : Only effective when have not connected to the wire controller
Closed circuit: hot water+cooling mode.
Open circuit : hot water + heating mode
- NOTE ③ : Useful when use dual energy for stopping compressor
Closed circuit: turn on
Open circuit : turn off
- NOTE ④ :Air condition turn on/off switch
Short circuit: turn on the air condition mode(cooling or heating)
Open circuit: turn off the air condition mode(cooling or heating)

2. The electrical box of internal structure

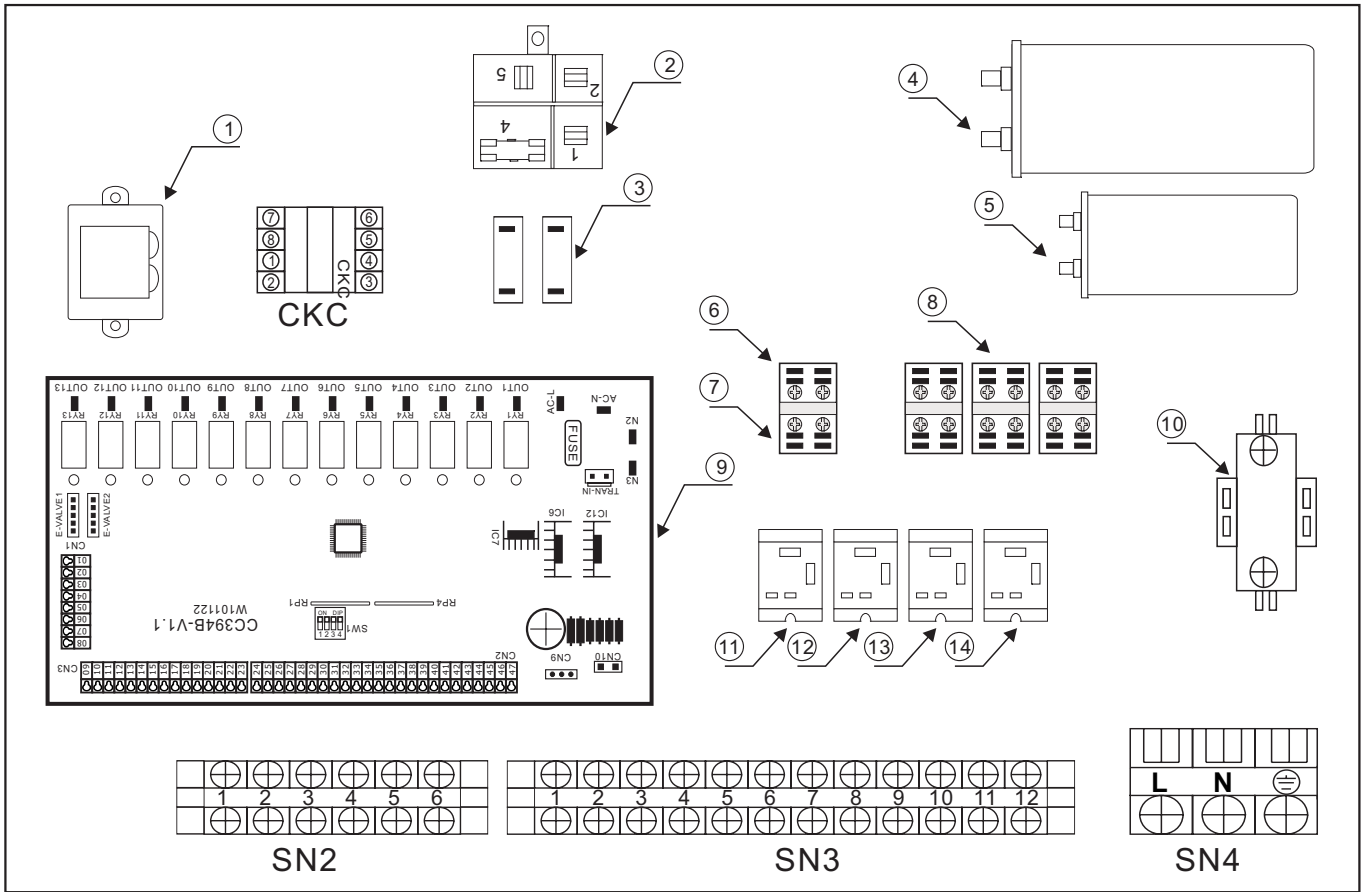
2.1 Mode:MAHRW040WA/PS(01)



NO.	Sign	Meaning
1	MK3077	Phase sequence current protection board
2		Fan capacitance
3		Transformer
5	KA1	Water supply cycle pump power relay
6	KA2	Solar water cycle pump power relay
7	KA3	Air condition (floor heating) pump relay
8	KA4	Hot water cycle pump relay

NO.	Sign	Meaning
9	KM1	Compressor A.C.contactor
10		Power input(380VAC/3PH/50Hz)
11		Hot water pump power output
12		Air concition pump power output
13		Solar water cycle pump power output
14		Water supply pump power output
15		Three -way valve power output
16		

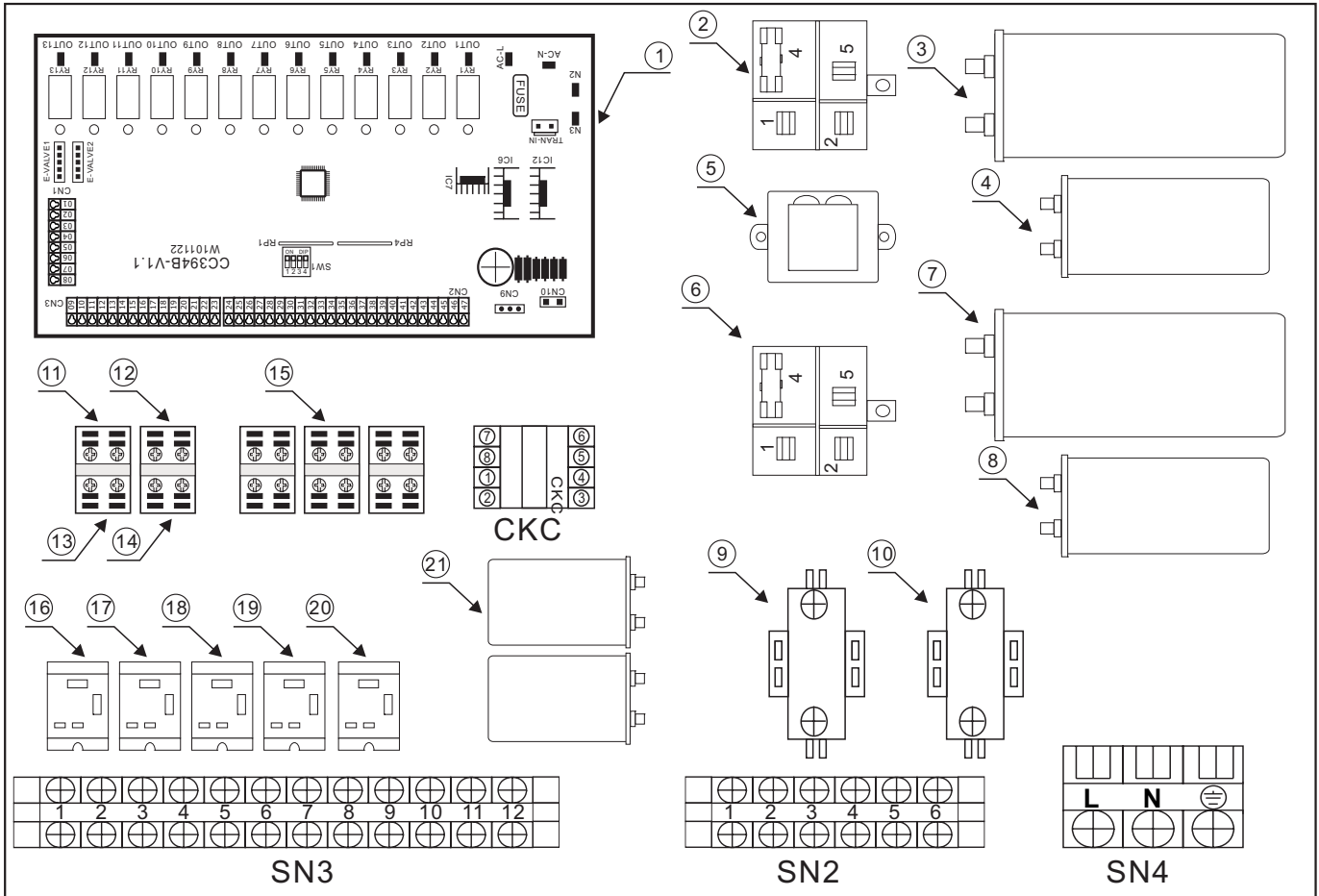
2.2 Mode:MACHRWS050ZA/P(01)



NO.	Sign	Meaning
1	TC	Transfer(220VAC/12VAC)
2		Soft starting relay
3		Fan motor capacitor
4		Compressor starting capacitance
5		Compressor running capacitance
6		Fan power public terminals-L
7		Power 220VAC (public terminals -L)
8		Power 220VAC (public terminals -N)
9	Mk3092	Controller
10	KM1	(System 1)compressor A.C. contactor
11	KA2	Solar water cycle pump relay
12	KA4	Floor heating water cycle pump relay
13	KA5	Water supply signal relay
14	KA6	Hot water cycle pump relay
1	CKC	Low water level
2		Power-N input
3		High water level
4		Middle water level
5		Reservation
6		Filling water valve power-L signal output
7		Power-L input
8		Power-L input

NO.	Sign	Meaning
1	SN2	Low water level
2		High water level
3		Middle water level
4		Unit turn on/off switch
5		Air condition (turn on/off) switch
6		GND
1	SN3	Filling water valve signal output
2		Three-way valve signal output
3		Public terminals-N
4		Solar water pump signal output
5		Floor water pump signal output
6		Public terminals-N
7		GND
8		Water supply signal output
9		Public terminals-N
10		Hot water pump signal output
11		Public terminals-N
12		GND
	SN4	Unit power input (220VAC/1PH/50Hz)

2.3 Mode:MACHRWS080ZB/P(01) MACHRWS100ZB/P(01)

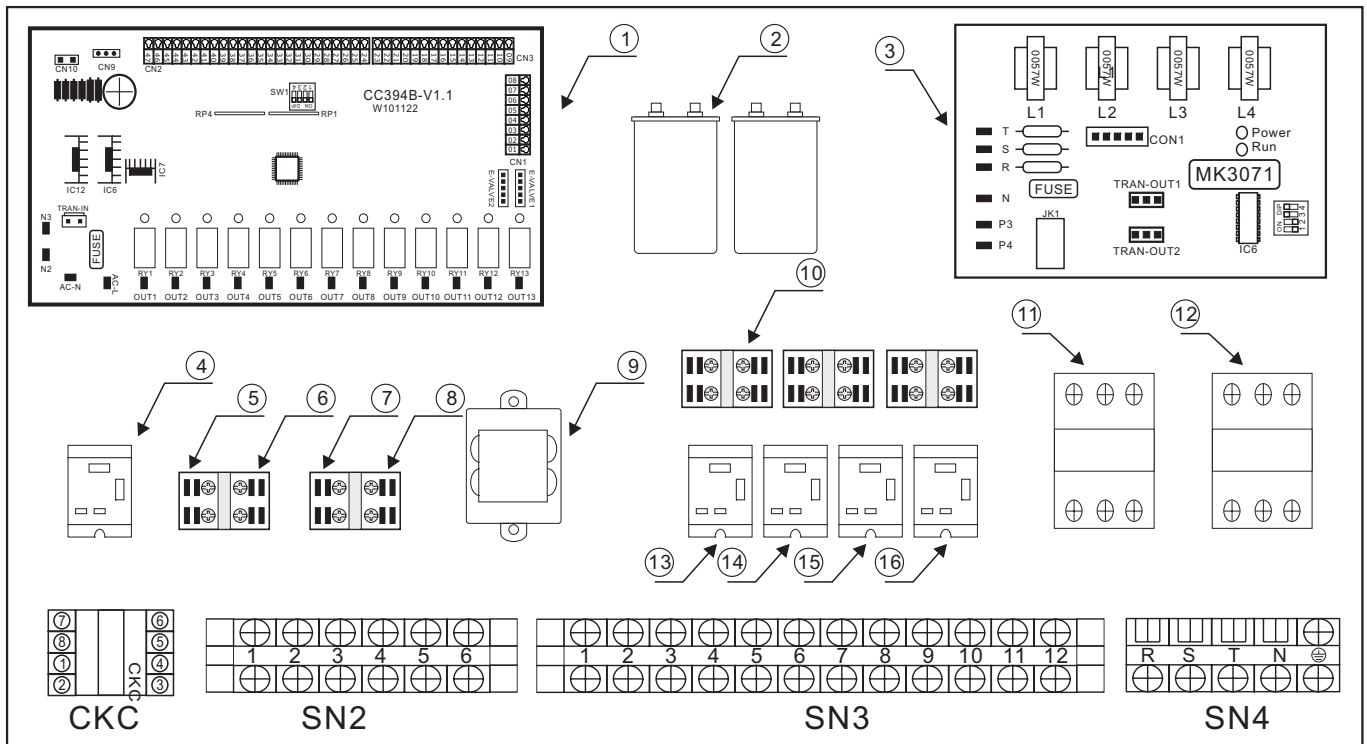


NO.	Sign	Meaning
1	Mk3092	Controller
2		System 1Soft starting relay
3		System 1compressor starting capacitance
4		System 1compressor running capacitance
5	TC	Transfer(220VAC/12VAC)
6		System 2Soft starting relay
7		System 2compressor starting capacitance
8		System 2compressor running capacitance
9	KM1	(System 1)compressor A.C.contactor
10	KM2	(System 2)compressor A.C.contactor
11		Crankshaft heater power public terminals-L
12		4-way valve power public terminals-L
13		Fan power public terminals-L ①
14		Power 220VAC (public terminals -L)
15		Power 220VAC (public terminals -N)
16	KA1	Fan power relay ①
17	KA2	Solar water pump power relay
18	KA4	Floor heating water cycle pump relay
19	KA5	Water supply signal relay
20	KA6	Hot water cycle pump relay
21		Fan motor capacitor

NOTE ① :Only effect for the heat pump which's power capacity is 10 horsepower or bigger 10 horsepower

NO.	Sign	Meaning
1	CKC	Low water level
2		Power-N input
3		High water level
4		Middle water level
5		Reservation
6	SN2	Filling water valve power-L signal output
7		Power-L input
8		Power-L input
1		Low water level
2		High water level
3		Middle water level
4	SN3	Unit turn on/off switch
5		Air condition (turn on/off) switch
6		GND
1		Filling water valve signal output
2		Three-way valve signal output
3		Public terminals-N
4		Solar water pump signal output
5		Floor water pump signal output
6		Public terminals-N
7		GND
8		Water supply signal output
9		Public terminals-N
10	Hot water pump signal output	
11	Public terminals-N	
12	GND	
	SN4	Unit power input (380VAC/3PH/50Hz)

2.4 Mode:MACHRWS080ZB/PS(01) MACHRWS100ZB/PS(01) MACHRWS150ZB/PS(01)

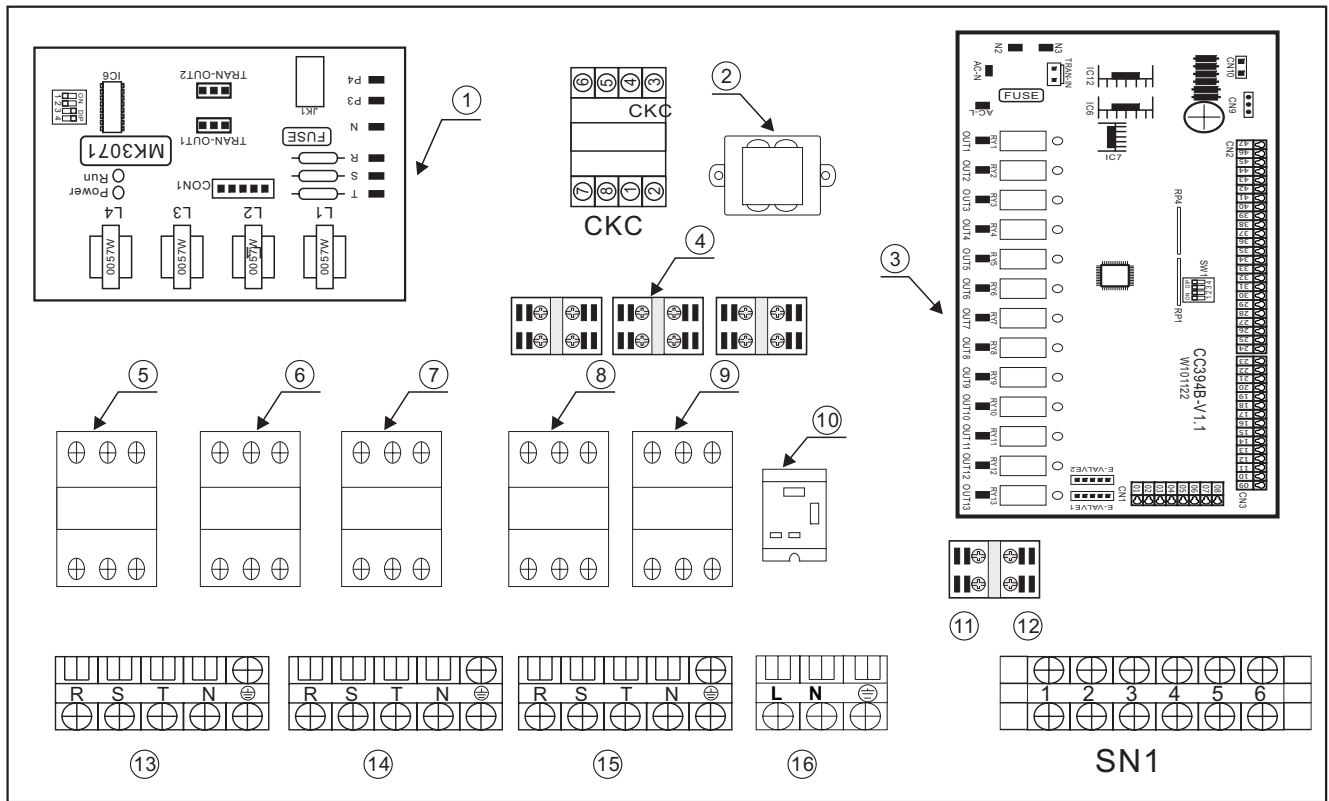


NO.	Sign	Meaning
1	Mk3092	Controller
2		Fan motor capacitor
3	MK3071	Phase sequence current protection board
4	ka1	Fan power relay ①
5		Fan power public terminals-L ①
6		Crankshaft heater power public terminals-L
7		4-way valve power public terminals-L
8		Power 220VAC (public terminals -L)
9	TC	Transfer(220VAC/12VAC)
10		Power 220VAC (public terminals -N)
11	KM1	(System 1)compressor A.C.contactor
12	KM2	(System 2)compressor A.C.contactor
13	KA2	Solar water cycle pump relay
14	KA4	Floor heating water cycle pump relay
15	KA5	Water supply signal relay
16	KA6	Hot water cycle pump relay
1	CKC	Low water level
2		Power-N input
3		High water level
4		Middle water level
5		Reservation
6		Filling water valve power-L signal output
7		Power-L input
8		Power-L input

NO.	Sign	Meaning
1	SN2	Low water level
2		High water level
3		Middle water level
4		Unit turn on/off switch
5		Air condition (turn on/off) switch
6		GND
1	SN3	Filling water valve signal output
2		Three-way valve signal output
3		Public terminals-N
4		Solar water pump signal output
5		Floor water pump signal output
6		Public terminals-N
7		GND
8		Water supply signal output
9		Public terminals-N
10		Hot water pump signal output
11		Public terminals-N
12		GND
	SN4	Unit power input (380VAC/3PH/50Hz)

NOTE ① :Only effect for the heat pump which's power capacity is 10 horsepower or bigger 10 horsepower

2.5 Mode:MACHRWS200ZB/PS(01)

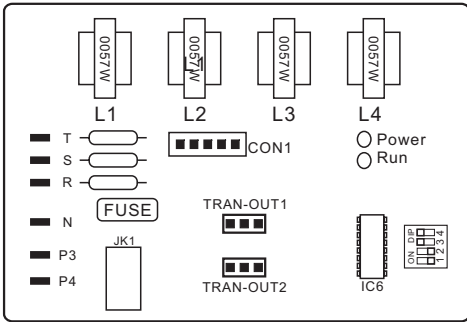


NO.	Sign	Meaning
1	MK3071	Phase sequence current protection board
2	TC	Transfer(220VAC/12VAC)
3	Mk3092	Controller
4	/	Public terminals-N
5	KM1	(System 1)compressor A.C.contactor
6	KM2	(System 2)compressor A.C.contactor
7	KM3	Fan power A.C.contactor
8	KM4	Hot water cycle pump A.C.contactor
9	KM5	Water supply cycle pump A.C.contactor
10	KA1	Water supply cycle pump signal relay
11	/	Crankshaft heater power public terminals-L
12	/	4-way valve power public terminals-L
13	/	Unit power input (380VAC/3PH/50Hz)
14	/	Hot water cycle pump output
15	/	Water supply cycle pump output
16	/	Water filling valve output

NO.	Sign	Meaning
1	SN1	Low water level
2		High water level
3		Middle water level
4		Unit turn on/off switch
5		Air condition (turn on/off) switch
6		GND
1	CKC	Low water level
2		Power-N input
3		High water level
4		Middle water level
5		Reservation
6		Filling water valve power-L signal output
7		Power-L input
8		Power-L input

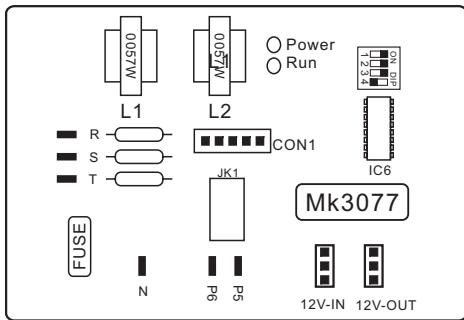
3. Power sequence, current protection board setting

3.1.Mk3071 power protection board input and output port definition



NO .	Symbol	Meaning
1	T	Power input
2	S	Power input
3	R	Power input
4	N	Power input
5	P3	Signal output
6	P4	Signal output
7	TRAN-OUT1	Connect transformer output (12VAC)
8	TRAN-OUT2	Connect PCB(MK3079) transformer output

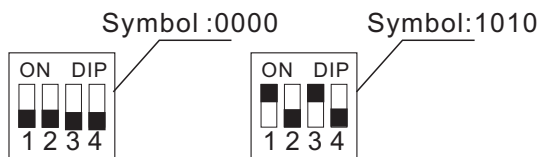
3.2.Mk3077 power protection board input and output port definition



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	power(12VAC)input
8	12V-OUT	power(12VAC)output

3.3.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

3.4.Every model's factory default value of current protection .

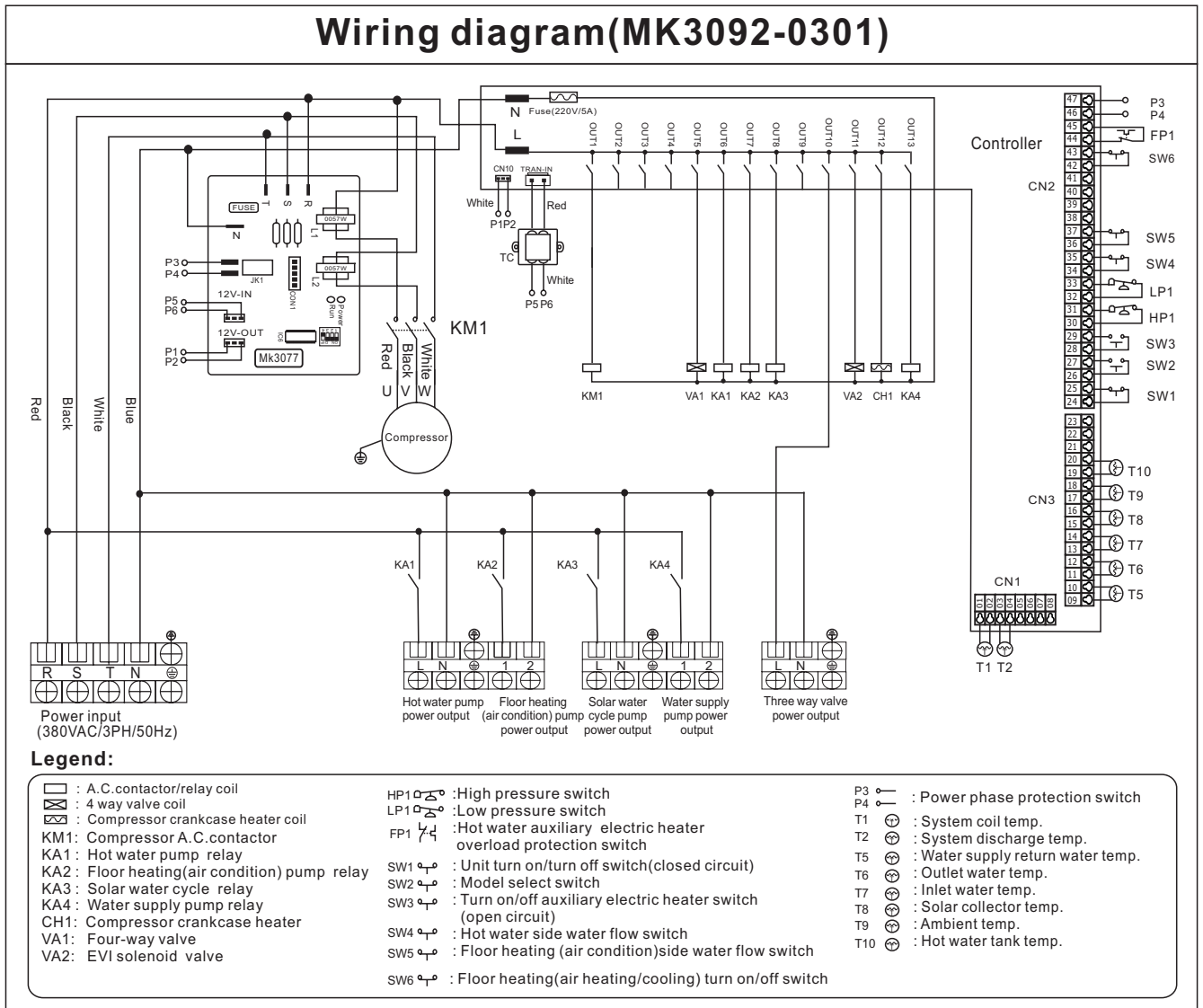
Mode	Default	Mode	Default	Mode	Default
MACHRW040ZA/PS(01)	12A	MACHRW100ZB/PS(01)	18A	MACHRW200ZB/PS(01)	20A
MACHRW080ZB/PS(01)	12A	MACHRW150ZB/PS(01)	18A		

3.5 . Failure indication

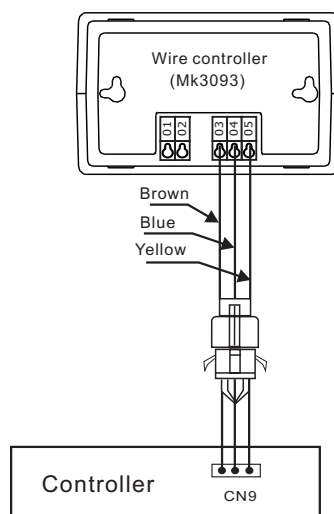
Run led display	Failure indication	Run led display	Failure indication
1flash 1 off	L1 side overcurrent protection	4flash 1 off	L4 side overcurrent protection
2flash 1 off	L2 side overcurrent protection	5flash 1 off	Power phase sequence protection
3flash 1 off	L3 side overcurrent protection	6flash 1 off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

4. Unit wiring diagram

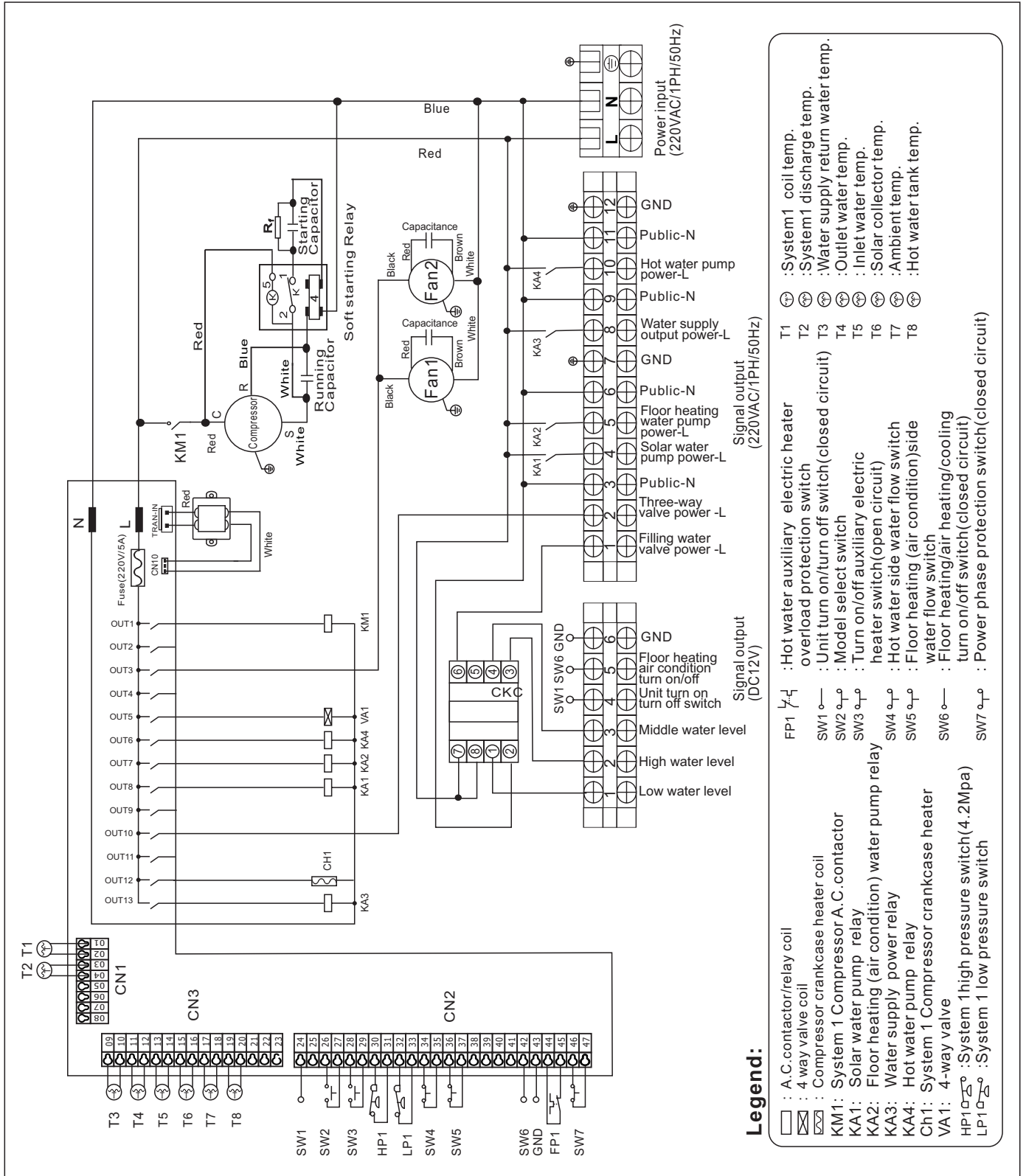
4.1 Mode: MACHRWS040ZA/PS(01)



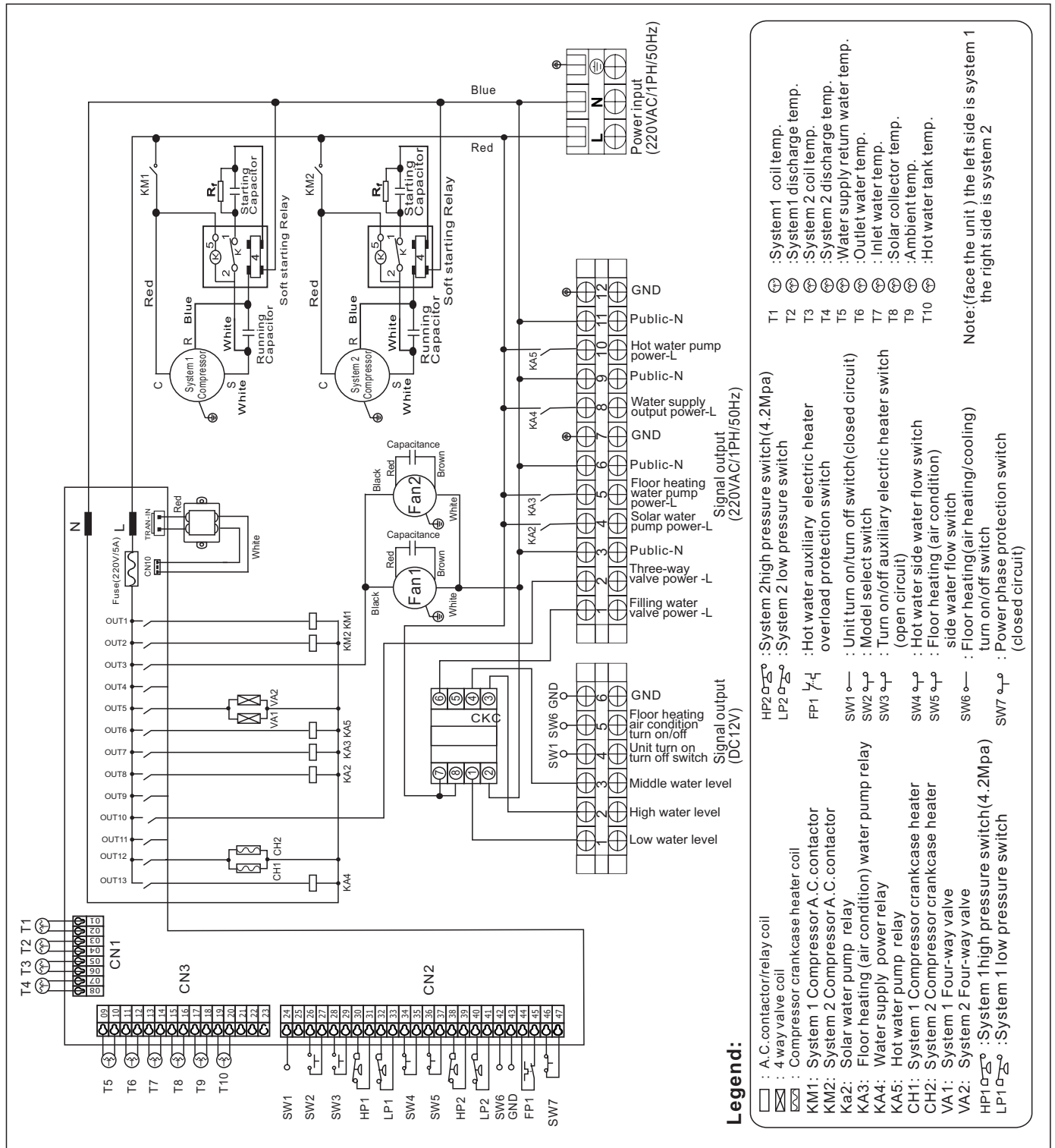
Note: Wiring diagram for wire controller and PCB



4.2 Mode: MACHRWS050ZA/P(01)



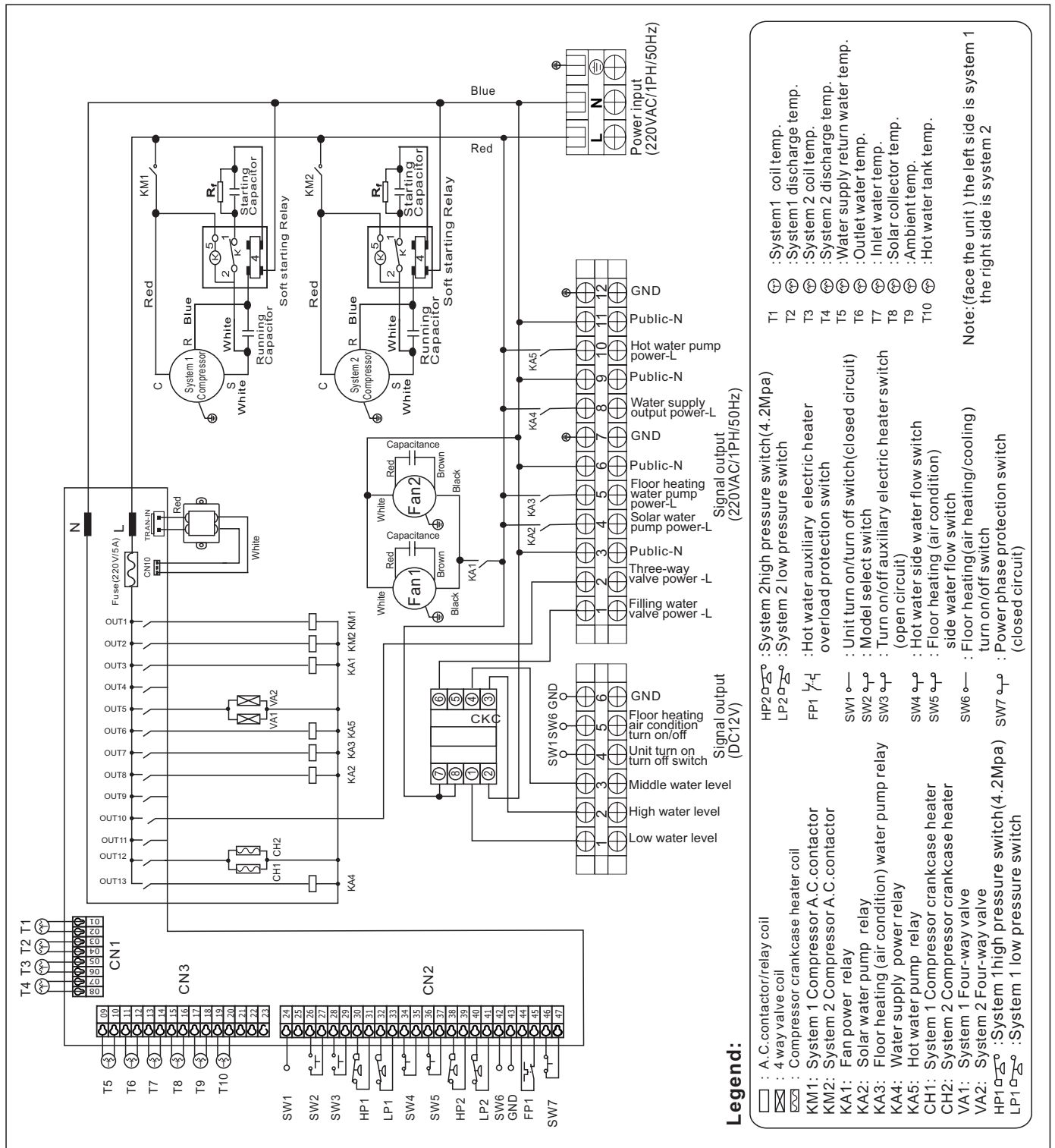
4.3 Mode: MACHRS080ZB/P(01)



Legend:

- : A.C. coil/relay coil
 - : 4-way valve coil
 - : Compressor crankcase heater coil
 - : System 1 Compressor A.C. contactor
 - : System 2 Compressor A.C. contactor
 - : Solar water pump relay
 - : Floor heating (air condition) water pump relay
 - : Water supply power relay
 - : Hot water pump relay
 - : System 1 Compressor crankcase heater
 - : System 2 Compressor crankcase heater
 - : System 1 Four-way valve
 - : System 1 high pressure switch(4.2Mpa)
 - : System 1 low pressure switch
 - : System 2 high pressure switch(4.2Mpa)
 - : System 2 low pressure switch
 - : Hot water auxiliary electric heater overload protection switch
 - : Unit turn on/turn off switch (closed circuit)
 - : Model select switch
 - : Turn on/off auxiliary electric heater switch (open circuit)
 - : Hot water side water flow switch
 - : Floor heating (air condition) side water flow switch
 - : Floor heating(air heating/cooling) turn on/off switch
 - : Power phase protection switch (closed circuit)
 - : System 1 coil temp.
: System 1 discharge temp.
: System 2 coil temp.
: System 2 discharge temp.
: Water supply return water temp.
: Outlet water temp.
: Inlet water temp.
: Solar collector temp.
: Ambient temp.
: Hot water tank temp.
- Note: (face the unit) the left side is system 1 the right side is system 2

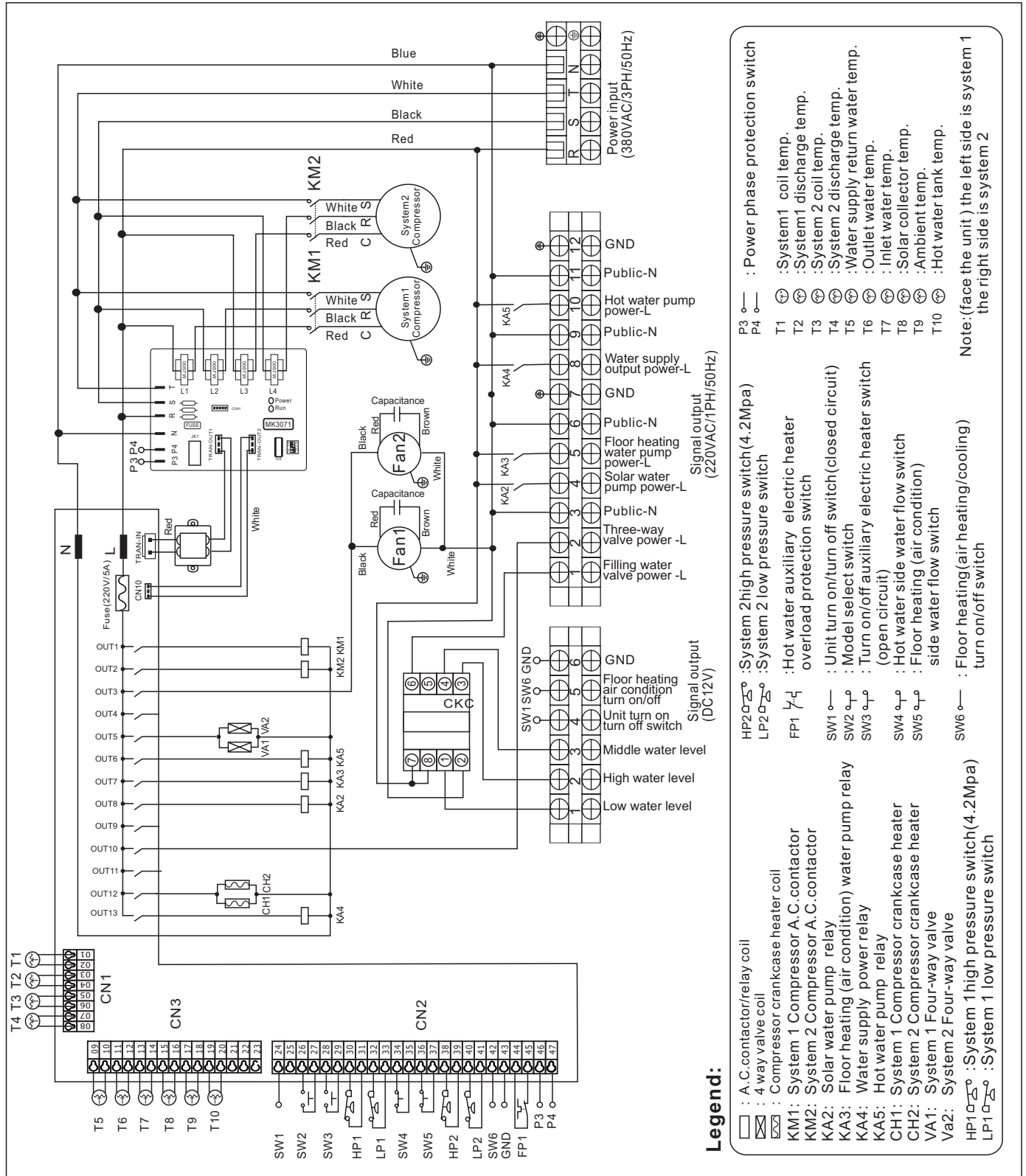
4.4 Mode: MACHRWS100ZB/P(01)



Legend:

- : A.C. contactor/relay coil
 - : 4-way valve coil
 - : Compressor crankcase heater coil
 - : System 1 Compressor A.C. contactor
 - : System 2 Compressor A.C. contactor
 - : Fan power relay
 - : Solar water pump relay
 - : Floor heating (air condition) water pump relay
 - : Water supply power relay
 - : Hot water pump relay
 - : System 1 Compressor crankcase heater
 - : System 2 Compressor crankcase heater
 - : System 1 Four-way valve
 - : System 2 Four-way valve
 - : System 1 high pressure switch(4.2Mpa)
 - : System 1 low pressure switch
 - : A.C. contactor/relay coil
 - : Compressor crankcase heater coil
 - : System 1 Compressor A.C. contactor
 - : System 2 Compressor A.C. contactor
 - : Fan power relay
 - : Solar water pump relay
 - : Floor heating (air condition) water pump relay
 - : Water supply power relay
 - : Hot water pump relay
 - : System 1 Compressor crankcase heater
 - : System 2 Compressor crankcase heater
 - : System 1 Four-way valve
 - : System 2 Four-way valve
 - : System 1 high pressure switch(4.2Mpa)
 - : System 1 low pressure switch
 - : System 2 high pressure switch(4.2Mpa)
 - : System 2 low pressure switch
 - : Hot water auxiliary electric heater overload protection switch
 - : Unit turn on/turn off switch(closed circuit)
 - : Model select switch
 - : Turn on/off auxiliary electric heater switch (open circuit)
 - : Hot water side water flow switch
 - : Floor heating (air condition) side water flow switch
 - : Floor heating (air heating/cooling) turn on/off switch
 - : Power phase protection switch (closed circuit)
- : System 1 coil temp.
 : System 1 discharge temp.
 : System 2 coil temp.
 : System 2 discharge temp.
 : Water supply return water temp.
 : Outlet water temp.
 : Inlet water temp.
 : Solar collector temp.
 : Ambient temp.
 : Hot water tank temp.
- Note:(face the unit) the left side is system 1 the right side is system 2

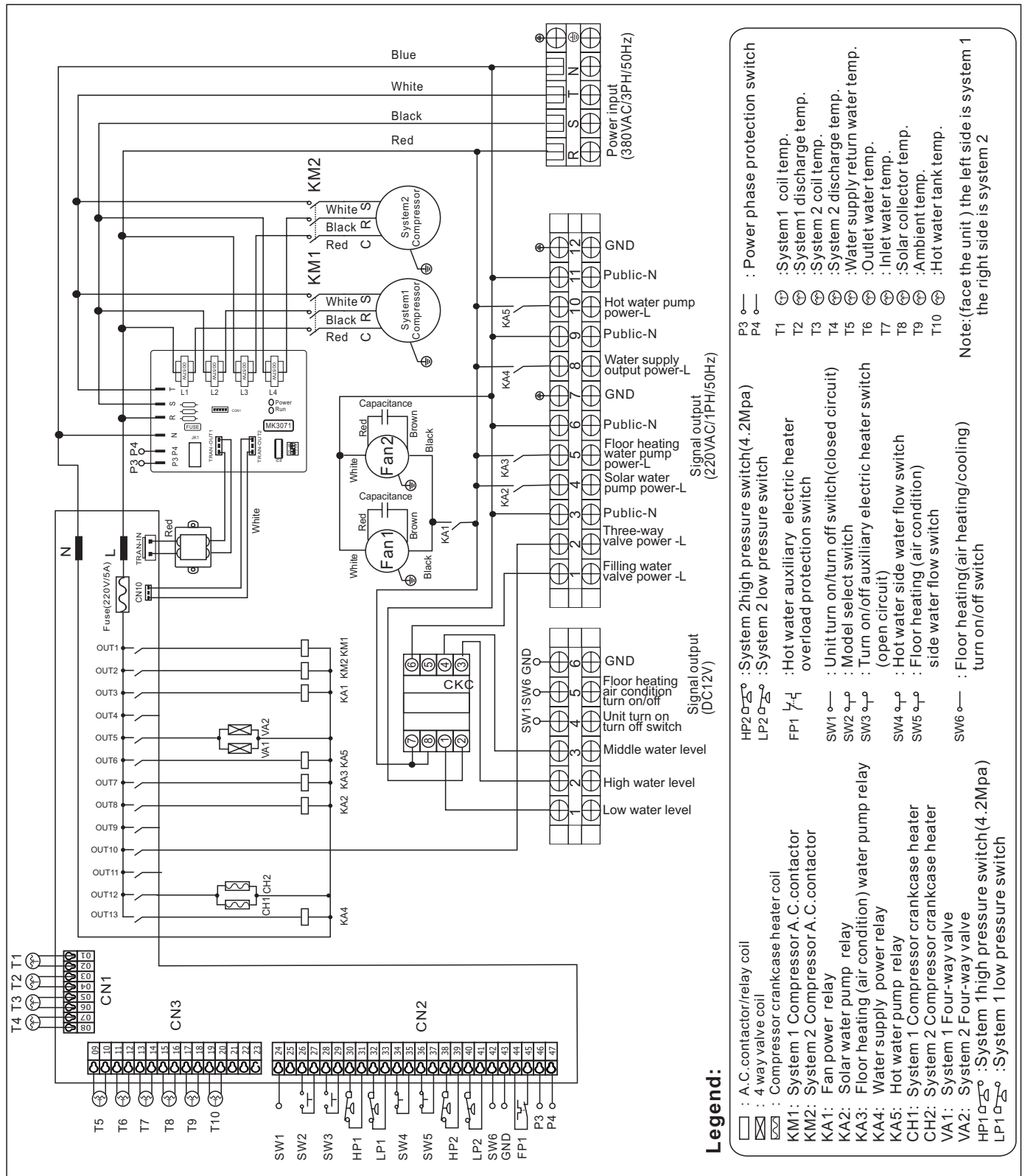
4.5 Mode: MACHRWS080ZB/PS(01)



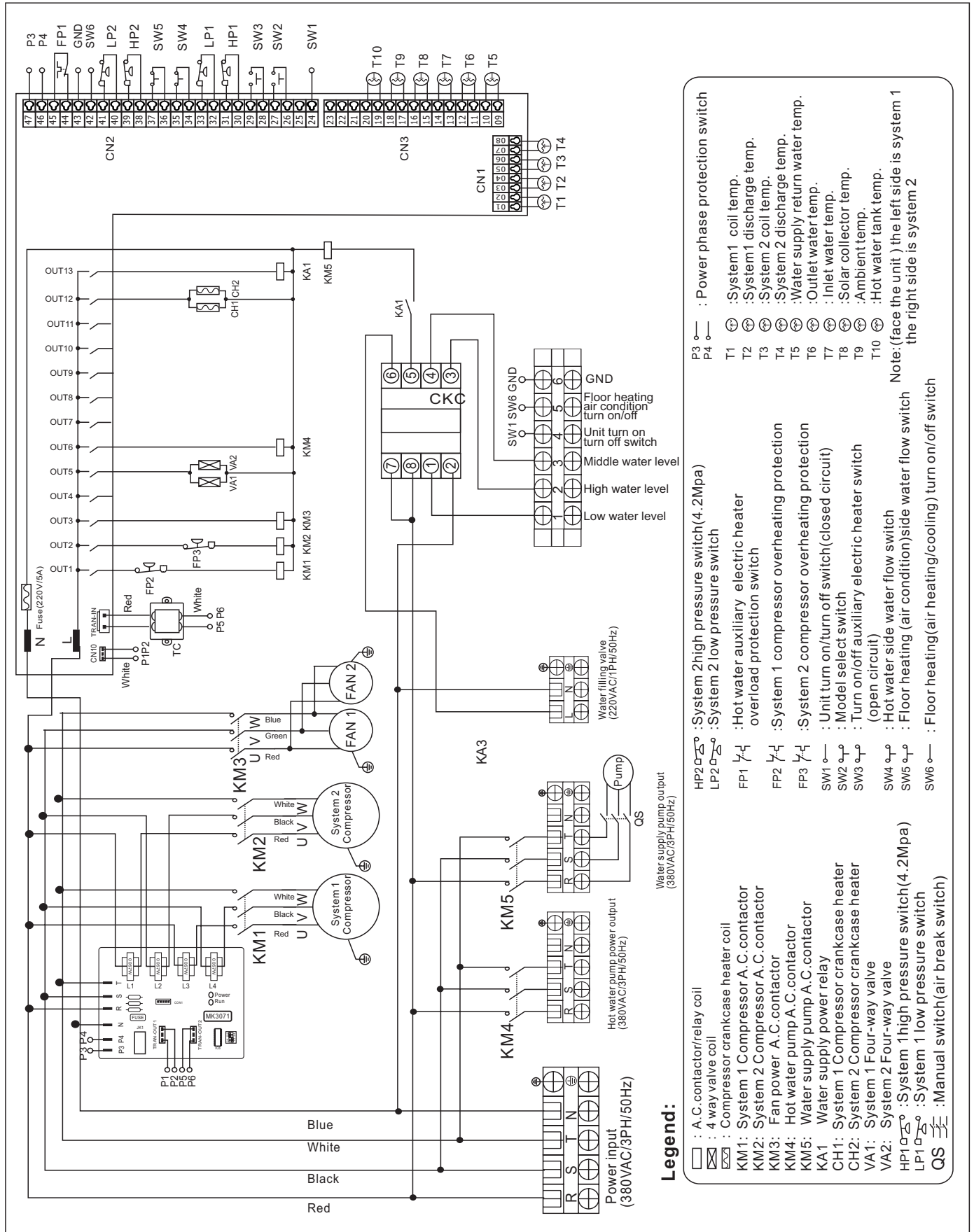
Legend:

- : A.C. contactor/relay coil
 - : 4 way valve coil
 - : Compressor crankcase heater coil
 - : System 1 Compressor A.C. contactor
 - : System 2 Compressor A.C. contactor
 - : Solar water pump relay
 - : Floor heating (air condition) water pump relay
 - : Water supply power relay
 - : Hot water pump relay
 - : System 1 Compressor crankcase heater
 - : System 2 Compressor crankcase heater
 - : System 1 Four-way valve
 - : System 2 Four-way valve
 - : System 1 high pressure switch(4.2Mpa)
 - : System 1 low pressure switch
 - : System 2 high pressure switch(4.2Mpa)
 - : System 2 low pressure switch
 - : Hot water auxiliary electric heater overload protection switch
 - : Unit turn on/turn off switch(closed circuit)
 - : Model select switch
 - : Turn on/off auxiliary electric heater switch (open circuit)
 - : Hot water side water flow switch
 - : Floor heating (air condition) side water flow switch
 - : Floor heating(air heating/cooling) turn on/off switch
 - : Power phase protection switch
 - : Power phase protection switch
 - : System 1 coil temp.
 - : System 1 discharge temp.
 - : System 2 coil temp.
 - : System 2 discharge temp.
 - : Water supply return water temp.
 - : Outlet water temp.
 - : Inlet water temp.
 - : Solar collector temp.
 - : Ambient temp.
 - : Hot water tank temp.
- Note: (face the unit) the left side is system 1 the right side is system 2

4.6 Mode: MACHRWS100ZB/PS(01) MACHRWS150ZB/PS(01)



4.7 Mode: MACHRWS200ZB/PS(01)



METRAN

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