



## **Engineering Manual**

**EUROTHERM HP 008-M2**

**EUROTHERM HP012-M2**

**EUROTHERM HP016-M2**

**Solardirekt24 GmbH**

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# 1 General

## 1.1 Unit General Information

### 1.1.1 Appearances

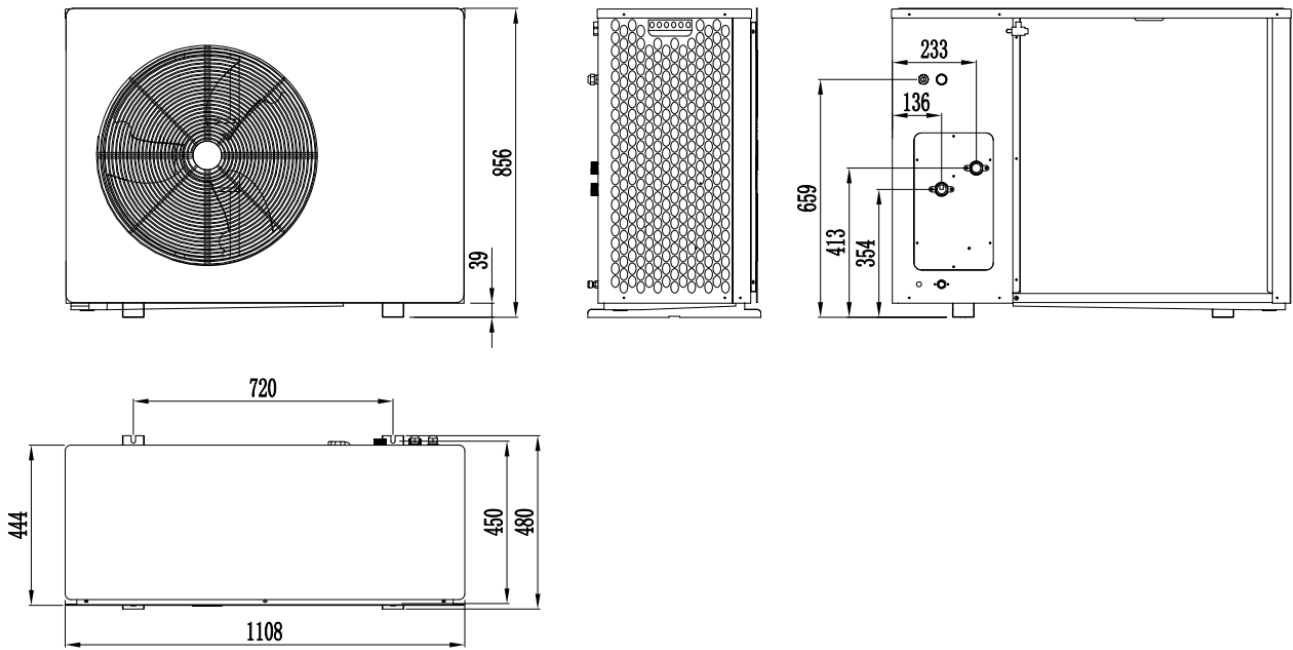
<b>Model</b>	<b>MMHP-008B1/MMHP-012B1/MMHP-016B1/MMHP-012B2/MMHP-016B2</b>
Picture	
<b>Model</b>	<b>MMHP-020B1/MMHP-020B2/MMHP-026B2</b>
Picture	

## 1.1.2 Model Specification

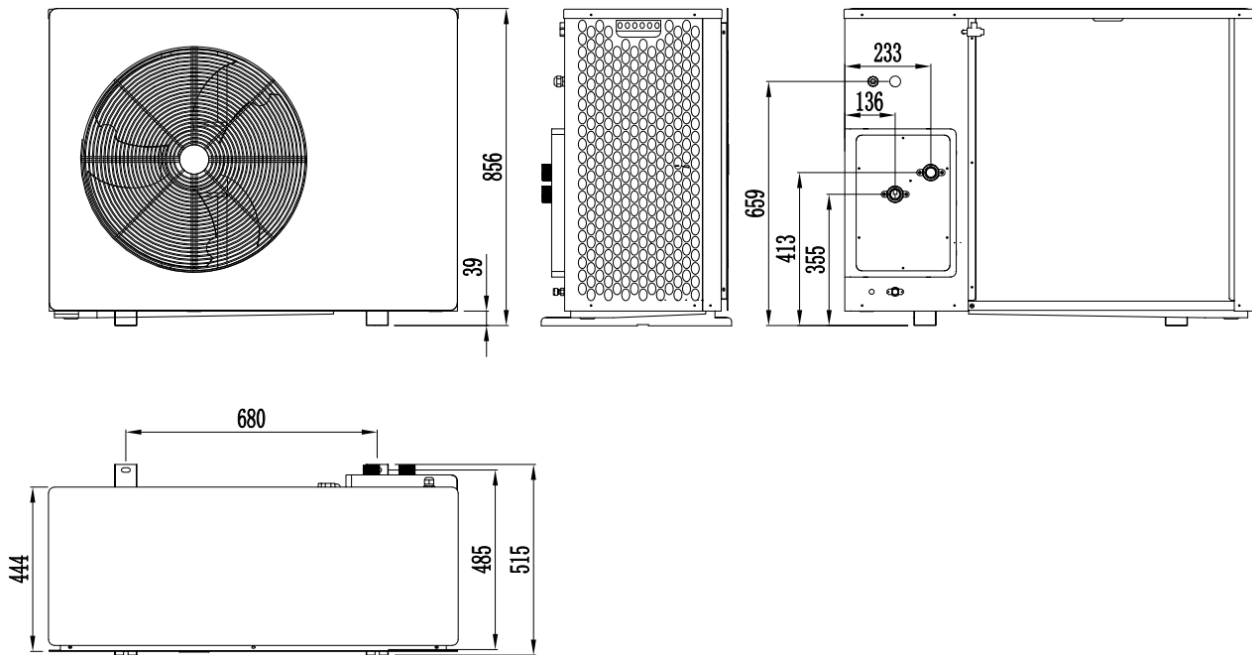
Model			MMHP-008B1	MMHP-012B1	MMHP-012B2	MMHP-016B1	MMHP-016B2	MMHP-020B1	MMHP-020B2	MMHP-026B2
Power Supply			220-240V ~50Hz	220-240V ~50Hz	380-415V/3N~/50 Hz	220-240V ~50Hz	380-415V/3N~/50 Hz	220-240V ~50Hz	380-415V/3N~/50 Hz	380-415V/3N~/50 Hz
Heating <sup>1</sup>	Capacity	KW	2.50-8.30	4.20-12.20	4.20-12.20	5.30-16.50	5.30-16.60	6.20-20.50	6.20-20.50	6.50-26.10
	Input Power	KW	0.57-1.92	0.86-2.88	0.86-2.88	1.15-4.15	1.15-4.15	1.36-5.28	1.36-5.28	1.78-6.45
	Input Current	A	2.53-8.52	3.82-12.77	1.46-4.89	5.10-18.41	1.86-6.70	6.10-23.67	2.31-8.96	2.87-10.35
Heating <sup>2</sup>	Capacity	KW	2.30-7.62	3.85-11.20	3.85-11.20	4.90-15.10	4.90-15.10	6.30-19.90	6.30-19.90	6.90-26.10
	Input Power	KW	0.75-2.61	1.13-3.75	1.13-3.75	1.65-5.25	1.65-5.25	1.65-6.82	1.65-6.82	1.95-8.55
	Input Current	A	3.32-11.58	5.01-16.6	1.92-6.37	7.32-23.30	1.67-8.47	7.40-30.56	2.80-11.58	3.15-13.80
Cooling	Capacity	KW	1.80-7.10	2.60-10.30	2.60-10.30	4.50-13.50	4.50-13.50	5.50-17.50	5.50-17.50	5.20-21.30
	Input Power	KW	0.61-2.43	0.91-3.65	0.91-3.65	1.45-4.85	1.45-4.85	1.65-6.25	1.65-6.25	1.95-8.20
	Input Current	A	2.71-10.78	4.03-16.19	1.55-6.20	6.43-21.52	2.34-7.82	7.40-28.02	2.80-10.61	3.15-13.23
SCOP (Water Temp. At 35°C)			4.92	4.55	4.55	4.58	4.58	4.67	4.67	4.85
SCOP (Water Temp. At 55°C)			3.37	3.41	3.41	3.39	3.39	3.45	3.45	3.42
Rated Input Power		KW	2.71	3.83	3.83	6.2	6.2	7.5	7.5	10
Rated Input Current		A	12	17	6.5	27.5	10.50	35	13	17
Refrigerant Type/Charge/GWP		... /kg	R32/1.25/675	R32/1.8/675	R32/1.8/675	R32/2.8/675	R32/2.8/675	R32/3.5/675	R32/3.5/675	R32/3.5/675
CO <sub>2</sub> Equivalent		/	0.84t	1.21t	1.21t	1.89t	1.89t	2.36t	2.36t	2.36t
Operation Pressure(Low Side)		MPa	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Operation Pressure(High Side)		MPa	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

### 1.1.3 Unit Dimension

#### 1.1.3.1 MMHP-008B1/MMHP-012B1/MMHP-012B2

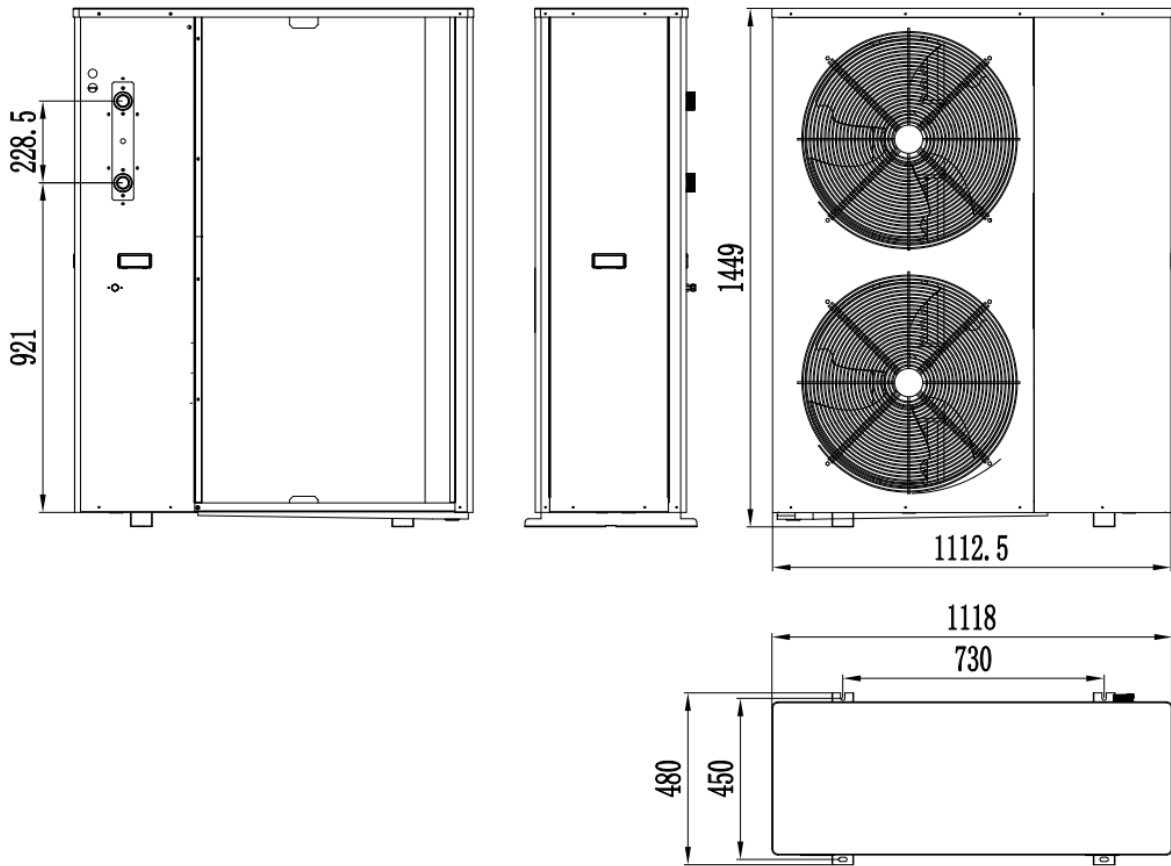


#### 1.1.3.2 MMHP-016B1/MMHP-016B2



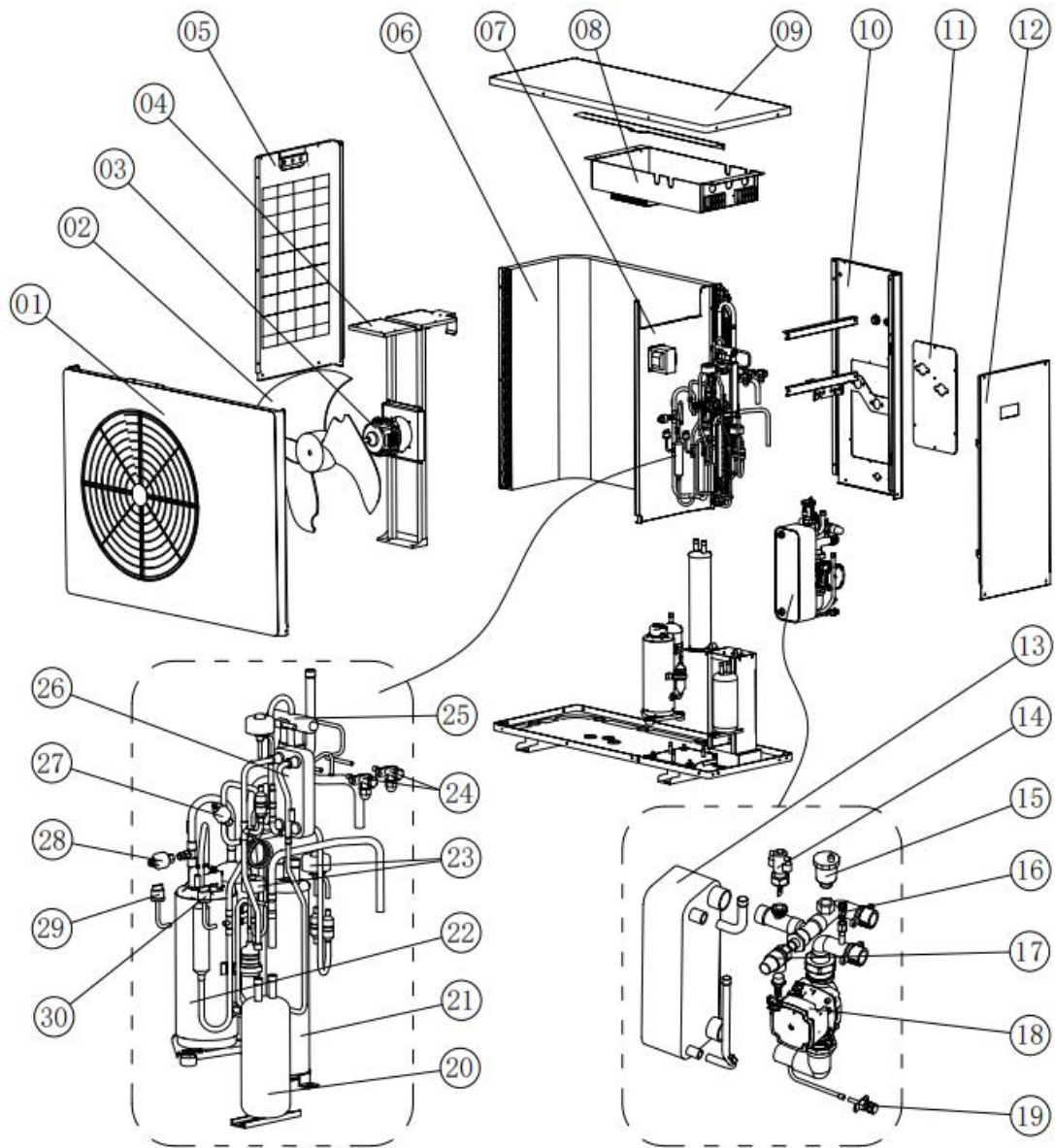


1.1.3.3 MMHP-020B1/MMHP-020B2/MMHP-026B2



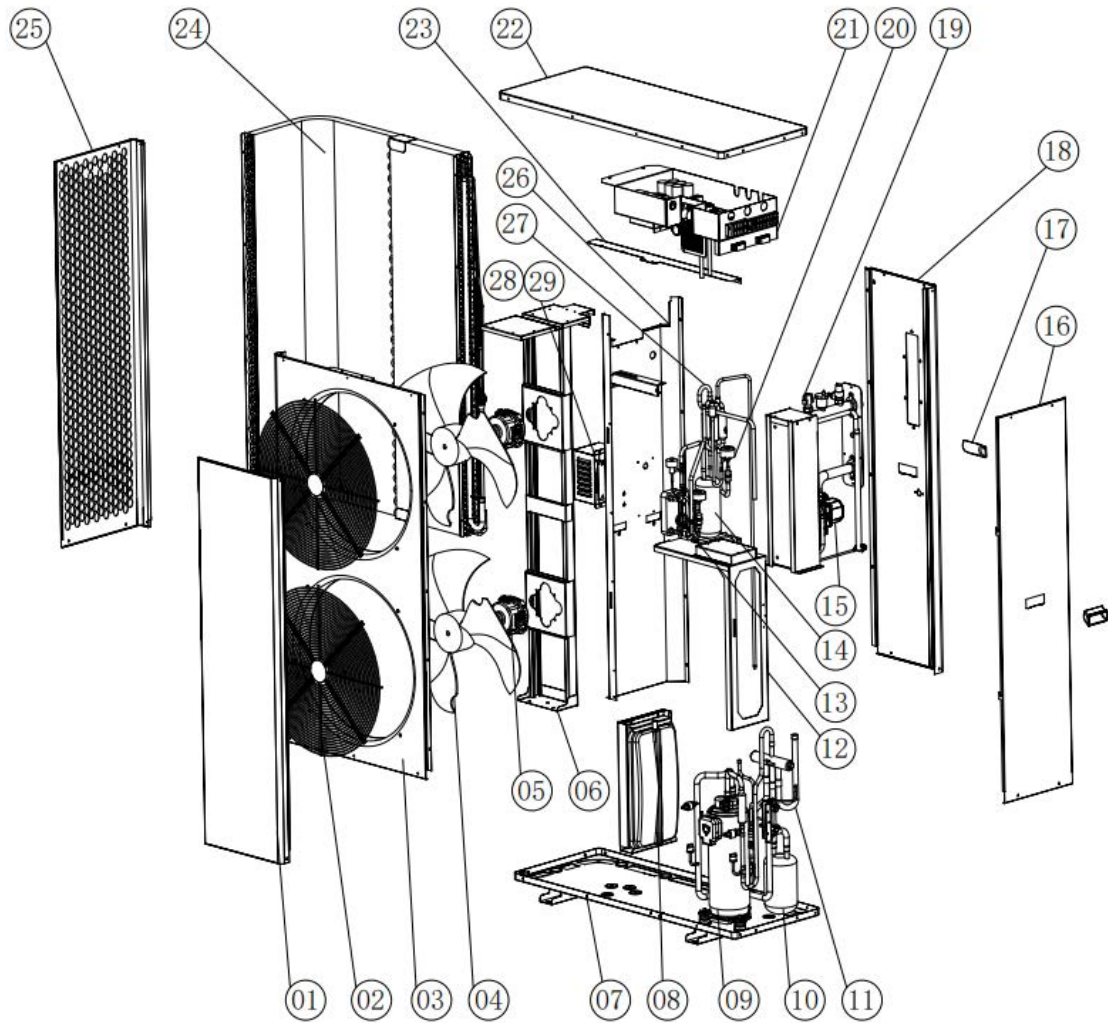
## 1.1.4 Exploded View

### 1.1.4.1 MMHP-008B1/MMHP-012B1/MMHP-012B2/MMHP-016B1/MMHP-016B2




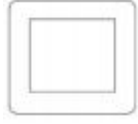


No.	Name	No.	Name	No.	Name
1	Front Panel omponents	11	Repair panel	21	Gas-liquid separator
2	Fan blade	12	Right side panel	22	Compressor
3	DC inverter motor	13	Plate heat exchanger	23	Electronic expansion valve
4	Motor bracket	14	Water flow switch	24	Maintenance of valve
5	Left panel	15	Auto exhaust valve	25	4-way valve
6	Evaporator omponents	16	Manual exhaust valve	26	Intermediate heat exchanger
7	Medium Septum	17	Safety relief valve	27	High pressure sensor
8	Electrical components	18	Water pump	28	Low pressure sensor
9	Top cover	19	Drain valve	29	Low-pressure switch
10	Back side panel	20	Reservoir	30	High-pressure switch

### 1.1.4.2 MMHP-020B1/MMHP-020B2/MMHP-026B2



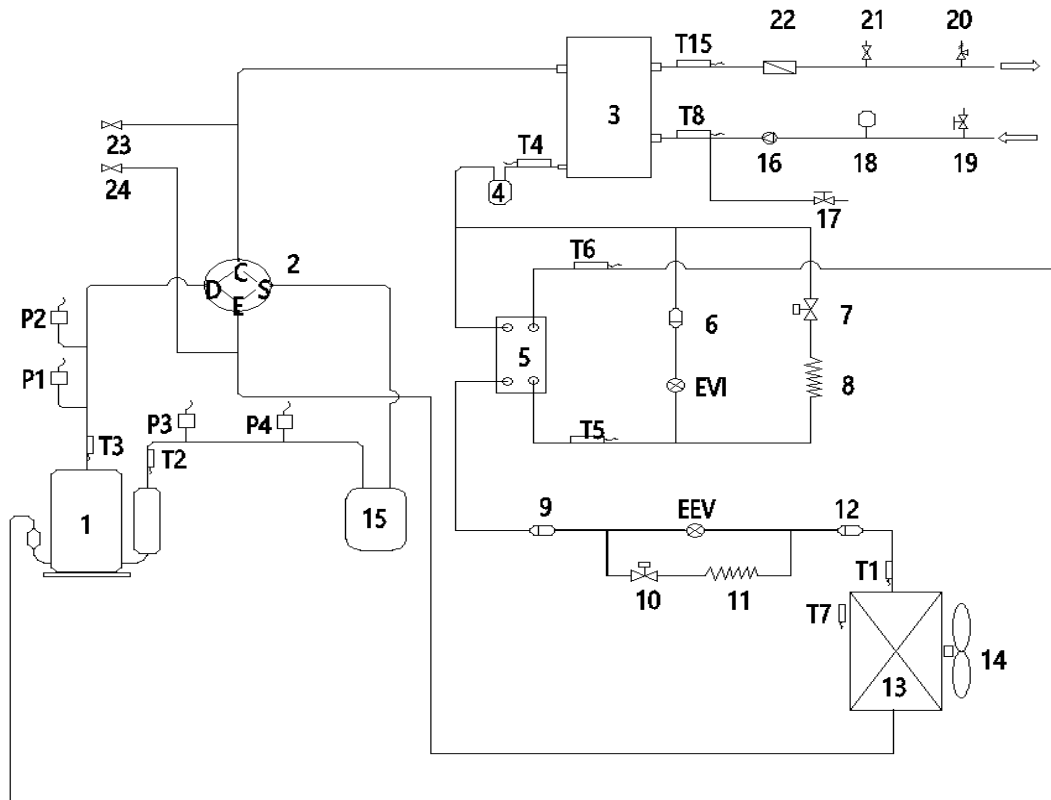
No.	Name	No.	Name	No.	Name
1	Right front panel	11	4-way valve	21	Electrical components
2	Air outlet grille	12	Plate heat exchanger base	22	Top cover
3	Front panel	13	Economizer components	23	Evaporator fixing plate
4	Fan blade	14	Accmulator	24	Evaporator components
5	Dc inverter motor	15	Water pump	25	Left panel
6	Motor bracket	16	Right side panel	26	Middle separated panel
7	Chassis components	17	Draw hands	27	Check valve assembly
8	Expasion tank	18	Back side panel	28	Reactor
9	Compressor	19	Plate heat exchanger	29	Reactance cover
10	Gas-liquid separator	20	EEV		

### 1.1.5 Accessories

Name		Quantity
Operation Manual		1
Wire Controller		1
Temperature Sensor		6
Rubber Mat		4

# 1.2 Unit System Information

## 1.2.1 Running Principle



No.	Name	No.	Name	No.	Name
1	Compressor	14	Fan	T3	Exhaust Temp. Sensor
2	4-Way Valve	15	Gas-liquid separator	T4	Inner Coil Temp. Sensor
3	Plate Heat Exchanger	16	Water Pump	T5	Inlet Temp. Sensor
No.	Name	No.	Name	No.	Name
4	Reservoir	17	Drain Valve	T6	Outlet Temp. Sensor
5	Plate Heat Exchanger	18*	Expansion Tank (not built-in)	T7	Ambient Temp. Sensor
6	Filter 1	19*	Manual Air Vent (not built-in)	T8	Water Inlet Temp. Sensor
7	Spray solenoid valve	20	Safe Valve	T15	Water Outlet Temp. Sensor
8	Spray capillary	21	Air Vent	P1	High Pressure Sensor
9	Filter 2	22	Water Flow Switch	P2	High Pressure Switch
10*	Throttling solenoid valve (not built-in)	23	Maintenance Valve (High Pressure Side)	P3	Low Pressure Sensor
11*	Auxiliary throttle capillary (not built-in)	24	Maintenance Valve (Low Pressure Side)	P4	Low Pressure Switch
12	Filter 3	T1	Coil Temp. Sensor	EEV	EEV
13	Evaporator	T2	Suction Temp. Sensor	EVI	EVI

## 1.2.2 Rated Capacity Table

### 1.2.2.1 MMHP-008B1

Heating Capacity <sup>1</sup>												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			40			45		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	3.40	1.13	3.00	3.25	1.37	2.37	3.19	1.52	2.10	1.66	1.60	1.62
-20	3.94	1.15	3.41	3.78	1.40	2.70	3.70	1.55	2.39	3.12	1.70	2.13
-15	4.61	1.18	3.92	4.42	1.43	3.09	4.32	1.58	2.74	3.62	1.73	2.44
-10	5.16	1.19	4.34	4.59	1.44	3.43	4.84	1.60	3.04	4.23	1.75	2.71
-7	5.47	1.18	4.65	5.24	1.43	3.67	5.13	1.58	3.25	4.74	1.73	2.90
-2	5.69	1.08	5.26	5.45	1.31	4.87	5.34	1.45	3.67	5.02	1.59	3.28
2	5.86	1.03	5.70	5.62	1.25	4.19	5.50	1.38	3.98	5.38	1.51	3.56
7	6.74	1.08	6.24	6.46	1.31	4.93	6.33	1.45	4.36	6.19	1.59	3.90
12	7.01	1.02	6.91	6.72	1.23	5.46	6.58	1.36	4.83	6.44	1.49	4.31
20	7.43	0.91	8.13	7.12	1.11	6.43	6.97	1.23	5.69	6.82	1.34	5.08
27	7.88	0.82	9.58	7.55	1.00	7.57	7.39	1.10	6.70	7.23	1.21	5.98

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Ambient Temperature (°C)	Water Outlet Temperature(°C)								
	50			55			60		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	3.05	1.81	1.69	2.98	1.96	1.52	/	/	/
-20	3.54	1.85	1.92	3.46	2.00	1.73	/	/	/
-15	4.14	1.88	2.20	4.05	2.04	1.99	2.91	2.00	1.45
-10	4.64	1.90	2.44	4.53	2.06	2.21	3.34	2.12	1.58
-7	4.92	1.88	2.61	4.81	2.03	2.36	3.84	2.25	1.71
-2	5.11	1.73	2.95	5.00	1.87	2.67	4.42	2.36	1.87
2	5.27	1.65	3.20	5.15	1.78	2.89	4.51	2.31	1.95
7	6.06	1.73	3.50	5.92	1.87	3.17	5.19	2.22	2.34
12	6.30	1.62	3.88	6.16	1.76	3.51	5.70	2.09	2.73
20	6.68	1.46	4.57	6.53	1.58	4.13	5.93	1.88	3.16
27	7.08	1.32	5.38	6.92	1.42	4.87	6.17	1.69	3.65

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Cooling Capacity <sup>1</sup>									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	7.25	1.68	4.32	7.91	1.60	4.93	8.70	1.51	5.76
20	6.77	1.71	3.95	7.39	1.64	4.52	8.13	1.54	5.27
25	6.33	1.75	3.62	6.91	1.67	4.14	7.60	1.57	4.83
30	5.92	1.78	3.32	6.46	1.70	3.79	7.10	1.61	4.42
35	5.53	1.82	3.04	6.03	1.74	3.47	6.64	1.64	4.05
40	4.87	1.80	2.70	5.31	1.72	3.09	5.84	1.62	3.60
45	3.99	1.73	2.31	4.35	1.65	2.64	4.79	1.56	3.08

1.Test Standard: EN14511

### 1.2.2.2 MMHP-012B1/MMHP-012B2

Heating Capacity <sup>1</sup>												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			40			45		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	5.68	2.09	2.72	5.33	2.40	2.22	5.17	2.58	2.00	5.00	2.76	1.81
-20	6.59	2.13	3.09	6.18	2.45	2.53	5.99	2.63	2.28	5.80	2.81	2.06
-15	7.71	2.17	3.55	7.23	2.50	2.90	7.01	2.68	2.61	6.79	2.87	2.37
-10	8.63	2.19	3.94	8.10	2.52	3.21	7.85	2.71	2.90	7.60	2.90	2.62
-7	9.15	2.17	4.22	8.59	2.50	3.44	8.32	2.68	3.10	8.06	2.87	2.81
-2	9.52	2.00	4.76	8.93	2.30	3.89	8.66	2.47	3.51	8.38	2.64	3.18
2	9.80	1.90	5.17	9.20	2.18	4.22	8.92	2.34	3.80	8.63	2.51	3.44
7	11.27	1.99	5.66	10.58	2.29	4.62	10.26	2.46	4.17	9.93	2.63	3.77
12	11.72	1.87	6.26	11.00	2.15	5.11	10.67	2.31	4.61	10.33	2.47	4.17
20	12.43	1.69	7.37	11.66	1.94	6.02	11.31	2.08	5.43	10.95	2.23	4.92
27	13.17	1.52	8.68	12.36	1.74	7.09	11.98	1.87	6.39	11.60	2.00	5.79

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Water Outlet Temperature(°C)										
Ambient Temperature (°C)	50			55			60			
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	
-25	4.84	2.94	1.65	4.68	3.12	1.50	4.52	3.31	1.37	
-20	5.61	3.00	1.87	5.42	3.18	1.71	5.24	3.37	1.55	
-15	6.57	3.05	2.15	6.35	3.24	1.96	6.13	3.44	1.78	
-10	7.36	3.09	2.38	7.11	3.27	2.17	6.87	3.47	1.98	
-7	7.80	3.05	2.55	7.53	3.24	2.32	7.28	3.44	2.12	
-2	8.11	2.81	2.89	7.83	2.98	2.63	7.57	3.16	2.39	
2	8.35	2.67	3.13	8.07	2.83	2.85	7.80	3.01	2.59	
7	9.61	2.80	3.43	9.28	2.97	3.12	8.97	3.16	2.84	
12	9.99	2.64	3.79	9.65	2.80	3.45	9.32	2.97	3.14	
20	10.59	2.37	4.46	10.23	2.52	4.07	9.88	2.67	3.70	
27	11.22	2.13	5.26	10.84	2.26	4.79	10.48	2.40	4.36	

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Cooling Capacity <sup>1</sup>									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	11.19	2.62	4.27	12.21	2.50	4.88	13.43	2.36	5.70
20	10.46	2.67	3.91	11.41	2.55	4.47	12.55	2.41	5.22
25	9.78	2.73	3.58	10.67	2.60	4.10	11.73	2.45	4.78
30	9.14	2.78	3.28	9.97	2.66	3.75	10.97	2.50	4.38
35	8.54	2.84	3.01	9.32	2.71	3.44	10.25	2.56	4.01
40	7.52	2.81	2.67	8.20	2.68	3.05	9.02	2.53	3.56
45	6.16	2.70	2.28	6.72	2.58	2.61	7.39	2.43	3.04

1.Test Standard: EN14511

### 1.2.2.3 MMHP-016B1/MMHP-016B2

Heating Capacity <sup>1</sup>												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			40			45		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	7.49	2.69	2.78	7.43	3.36	2.21	7.40	3.77	1.96	7.37	4.19	1.76
-20	8.69	2.75	3.16	8.62	3.43	2.52	8.59	3.85	2.23	8.55	4.27	2.00
-15	10.17	2.80	3.63	10.09	3.49	2.89	10.04	3.93	2.56	10.00	4.36	2.30
-10	11.39	2.83	4.02	11.30	3.53	3.20	11.25	3.96	2.84	11.20	4.40	2.55
-7	12.07	2.80	4.31	11.97	3.49	3.43	11.92	3.93	3.04	11.88	4.36	2.73
-2	12.55	2.58	4.87	12.45	3.21	3.87	12.40	3.61	3.43	12.35	4.01	3.08
2	12.93	2.45	5.28	12.83	3.05	4.20	12.77	3.43	3.72	12.72	3.981	3.34
7	14.87	2.57	5.78	14.75	3.21	4.60	14.69	3.60	4.08	14.63	4.00	3.66
12	15.47	2.42	6.40	15.34	3.01	5.09	15.28	3.39	4.51	15.22	3.76	4.05
20	16.39	2.18	7.53	16.26	2.71	5.99	16.19	3.05	5.31	16.13	3.38	4.77
27	17.38	1.96	8.87	17.24	2.44	7.06	17.17	2.74	6.26	17.10	3.04	5.62

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Heating Capacity <sup>1</sup>									
Ambient Temperature (°C)	Water Outlet Temperature(°C)								
	50			55			60		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	7.34	4.60	1.60	7.31	5.02	1.46	7.28	5.47	1.33
-20	8.51	4.69	1.81	8.48	5.12	1.66	8.44	5.58	1.51
-15	9.96	4.79	2.08	9.92	5.22	1.90	9.88	5.69	1.74
-10	11.16	4.84	2.31	11.11	5.27	2.11	11.07	5.75	1.93
-7	11.83	4.79	2.47	11.78	5.22	2.26	11.73	5.69	2.06
-2	12.30	4.40	2.79	12.25	4.80	2.55	12.20	5.23	2.33
2	12.67	4.18	3.03	12.62	4.56	2.77	12.57	4.97	2.53
7	14.57	4.39	3.32	14.51	4.79	3.03	14.45	5.22	2.77
12	15.15	4.13	3.67	15.09	4.50	3.35	15.03	4.91	3.06
20	16.06	3.72	4.32	16.00	4.05	3.95	15.93	4.42	3.61
27	17.03	3.34	5.09	16.96	3.65	4.65	16.89	3.97	4.25

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Cooling Capacity <sup>1</sup>									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	16.38	4.16	3.94	17.87	3.97	4.50	19.66	3.74	5.25
20	15.31	4.24	3.61	16.71	4.05	4.12	18.38	3.82	4.81
25	14.31	4.33	3.30	15.61	4.13	3.78	17.17	3.90	4.41
30	13.38	4.42	3.03	14.59	4.22	3.46	16.05	3.98	4.03
35	12.50	4.51	2.77	13.64	4.31	3.17	15.00	4.06	3.70
40	11.00	4.47	2.46	12.00	4.26	2.82	13.20	4.02	3.28
45	9.02	4.29	2.10	9.84	4.09	2.40	10.82	3.86	2.81

1.Test Standard: EN14511



### 1.2.2.4 MMHP-020B1/MMHP-020B2

Heating Capacity <sup>1</sup>												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			40			45		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	9.53	3.50	2.73	9.46	4.36	2.17	9.42	4.90	1.92	9.38	5.44	1.73
-20	11.06	3.57	3.10	10.97	4.45	2.47	10.93	5.00	2.19	10.88	5.55	1.96
-15	12.94	3.64	3.56	12.83	4.54	2.83	12.78	5.10	2.51	12.73	5.66	2.25
-10	14.49	3.67	3.94	14.37	4.58	3.14	14.32	5.15	2.78	14.26	5.71	2.50
-7	15.36	3.64	4.22	15.24	4.54	3.36	15.18	5.10	2.98	15.12	5.66	2.67
-2	15.97	3.35	4.77	15.85	4.17	3.80	15.78	4.69	3.37	15.72	5.20	3.02
2	16.45	3.18	5.18	16.32	3.96	4.12	16.26	4.45	3.65	16.19	4.94	3.28
7	18.92	3.34	5.67	18.77	4.16	4.51	18.70	4.68	4.00	18.62	5.19	3.59
12	19.68	3.14	6.27	19.52	3.91	4.99	19.44	4.40	4.42	19.36	4.88	3.97
20	20.86	2.82	7.39	20.69	3.52	5.88	20.61	3.96	5.21	20.53	4.39	4.67
27	22.11	2.54	8.70	21.93	3.17	6.92	21.85	3.56	6.14	21.76	3.95	5.51

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Water Outlet Temperature(°C)									
Ambient Temperature (°C)	50			55			60		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	9.34	5.98	1.56	9.31	6.51	1.43	9.27	7.10	1.31
-20	10.84	6.09	1.78	10.79	6.64	1.62	10.75	7.24	1.48
-15	12.68	6.22	2.04	12.63	6.78	1.86	12.58	7.39	1.70
-10	14.20	6.28	2.26	14.14	6.85	2.07	14.09	7.46	1.89
-7	15.05	6.22	2.42	14.99	6.78	2.21	14.93	7.39	2.02
-2	15.66	5.72	2.74	15.59	6.23	2.50	15.53	6.80	2.29
2	16.13	5.43	2.97	16.06	5.92	2.71	16.00	6.46	2.48
7	18.55	5.70	3.25	18.47	6.22	2.97	18.40	6.78	2.71
12	19.29	5.36	3.60	19.21	5.85	3.29	19.13	6.37	3.00
20	20.44	4.83	4.24	20.36	5.26	3.87	20.28	5.74	3.54
27	21.67	4.34	4.99	21.58	4.74	4.56	21.50	5.16	4.16

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Cooling Capacity <sup>1</sup>									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	20.82	4.94	4.21	22.71	4.72	4.81	24.98	4.45	5.61
20	19.45	5.04	3.86	21.22	4.82	4.41	23.34	4.54	5.14
25	18.18	5.15	3.53	19.83	4.91	4.04	21.82	4.63	4.71
30	16.99	5.25	3.23	18.54	5.01	3.70	20.39	4.73	4.31
35	15.88	5.36	2.96	17.32	5.12	3.39	19.06	4.82	3.95
40	13.97	5.31	2.63	15.24	5.07	3.01	16.77	4.78	3.51
45	11.46	5.09	2.25	12.50	4.86	2.57	13.75	4.59	3.00

1.Test Standard: EN14511

### 1.2.2.5 MMHP-022B2

Heating Capacity <sup>1</sup>												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			40			45		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	12.13	4.83	2.51	12.08	5.79	2.09	12.05	6.36	1.89	12.03	6.94	1.73
-20	14.08	4.93	2.86	14.01	5.90	2.37	13.98	6.49	2.15	13.95	7.07	1.97
-15	16.47	5.02	3.28	16.40	6.02	2.72	16.36	6.62	2.47	16.32	7.22	2.26
-10	18.45	5.07	3.63	18.36	6.08	3.02	18.32	6.68	2.74	18.28	7.29	2.51
-7	19.55	5.02	3.89	19.47	6.02	3.23	19.42	6.62	2.93	19.38	7.22	2.69
-2	20.33	4.62	4.40	20.24	5.54	3.65	20.20	6.09	3.32	20.16	6.64	3.04
2	20.94	4.39	4.77	20.85	5.26	3.96	20.81	5.78	3.60	20.76	6.31	3.29
7	24.09	4.61	5.22	23.98	5.53	4.34	23.93	6.07	3.94	23.88	6.62	3.61
12	25.05	4.33	5.78	24.94	5.19	4.80	24.88	5.71	4.36	24.83	6.22	3.99
20	26.55	3.90	6.81	26.44	4.67	5.66	26.38	5.14	5.13	26.32	5.60	4.70
27	28.14	3.51	8.02	28.02	4.21	6.66	27.96	4.62	6.05	27.90	5.04	5.53

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Water Outlet Temperature(°C)									
Ambient Temperature (°C)	50			55			60		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	12.00	7.51	1.60	11.98	8.08	1.48	11.95	8.70	1.37
-20	13.92	7.66	1.82	13.89	8.25	1.68	13.86	8.88	1.56
-15	16.29	7.81	2.08	16.25	8.41	1.93	16.22	9.05	1.79
-10	18.24	7.89	2.31	18.20	8.49	2.14	18.16	9.14	1.99
-7	19.34	7.81	2.48	19.30	8.41	2.29	19.25	9.05	2.13
-2	20.11	7.19	2.80	20.07	7.74	2.59	20.02	8.33	2.40
2	20.72	6.83	3.03	20.67	7.35	2.81	20.62	7.91	2.61
7	23.82	7.17	3.32	23.77	7.72	3.08	23.72	8.31	2.85
12	24.78	6.74	3.68	24.72	7.25	3.41	24.67	7.81	3.16
20	26.26	6.07	4.33	26.20	6.53	4.01	26.15	7.03	3.72
27	27.84	5.46	5.10	27.78	5.88	4.73	27.72	6.33	4.38

1.Test Standard: EN14511

Notes : Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Cooling Capacity <sup>1</sup>									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	26.79	6.59	4.06	29.23	6.30	4.64	32.15	5.94	5.42
20	25.04	6.73	3.72	27.32	6.42	4.25	30.05	6.06	4.96
25	23.40	6.87	3.41	25.53	6.55	3.89	28.08	6.18	4.54
30	21.87	7.01	3.12	23.86	6.69	3.57	26.24	6.31	4.16
35	20.44	7.15	2.86	22.30	6.83	3.27	24.53	6.44	3.81
40	17.99	7.08	2.54	19.62	6.76	2.90	21.58	6.37	3.39
45	14.75	6.80	2.17	16.09	6.49	2.48	17.70	6.12	2.89

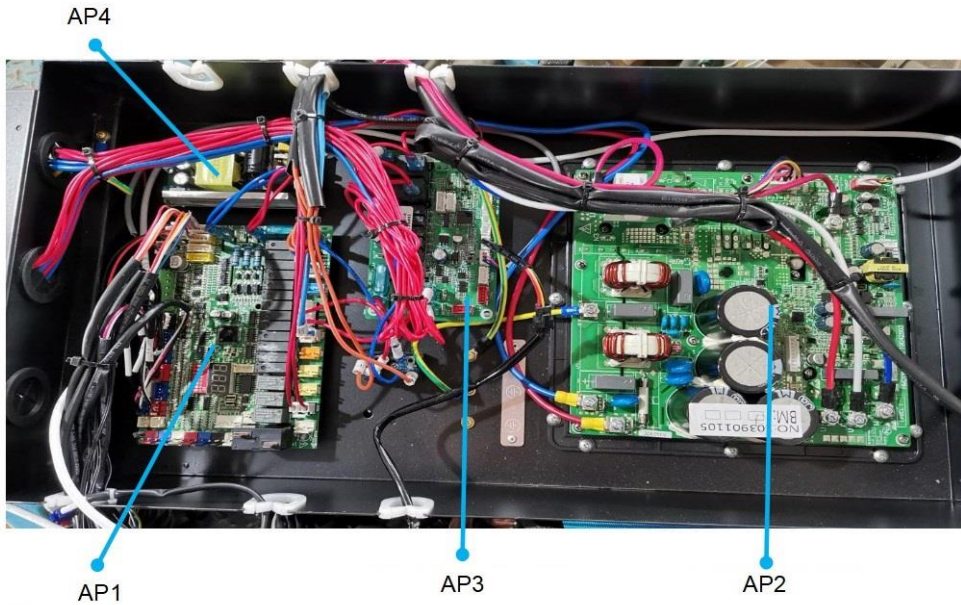
1.Test Standard: EN14511





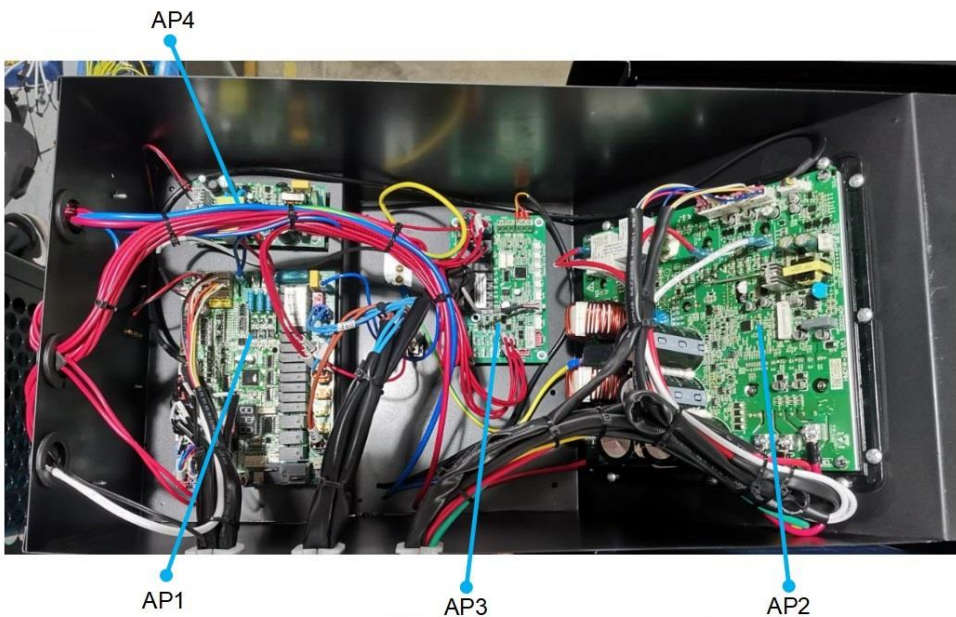
### 1.3.2 Electrical Layout

#### 1.3.2.1 MMHP-008B1/MMHP-012B1/MMHP-016B1



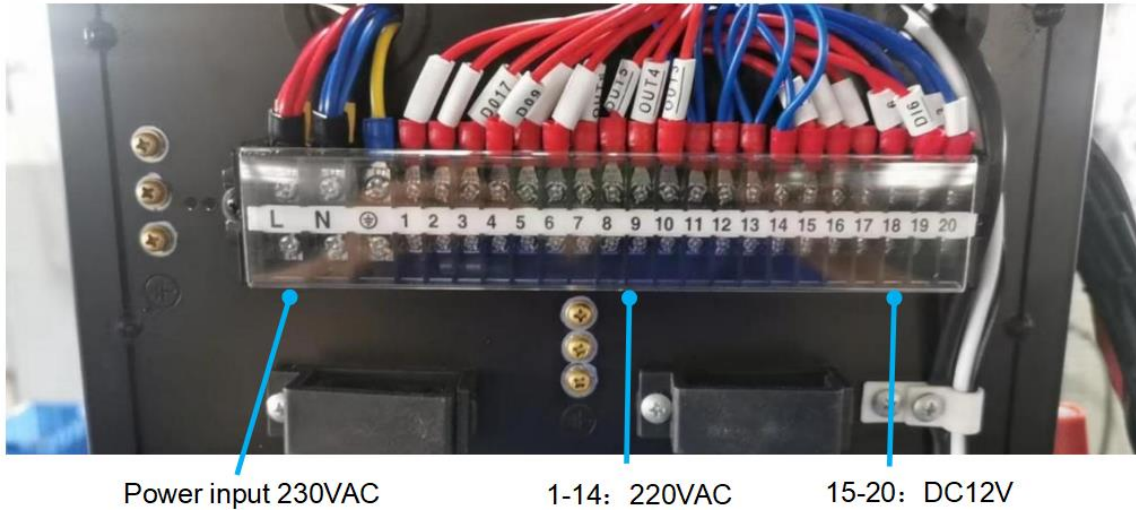
No.	Description
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board

#### 1.3.2.2 MMHP-020B1

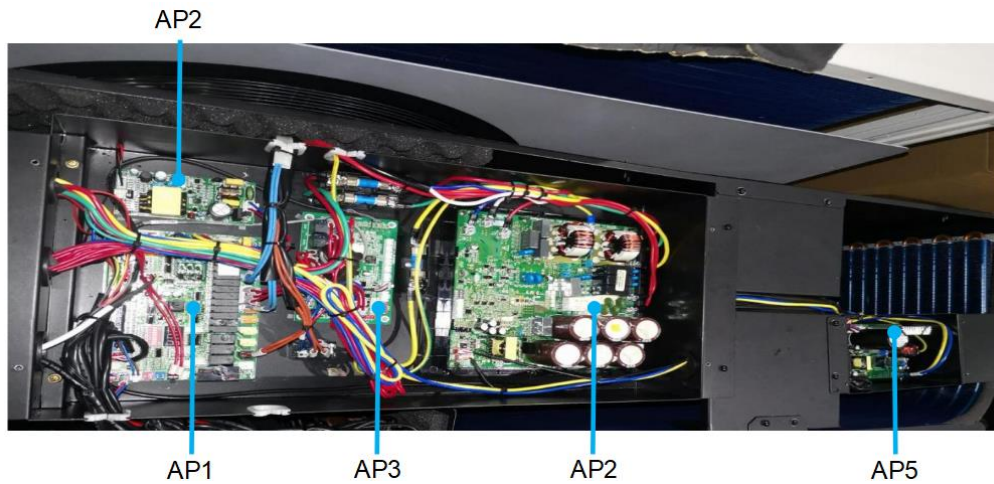


No.	Description
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board

### 1.3.2.3 MMHP-008B1/MMHP-012B1/MMHP-016B1/MMHP-020B1

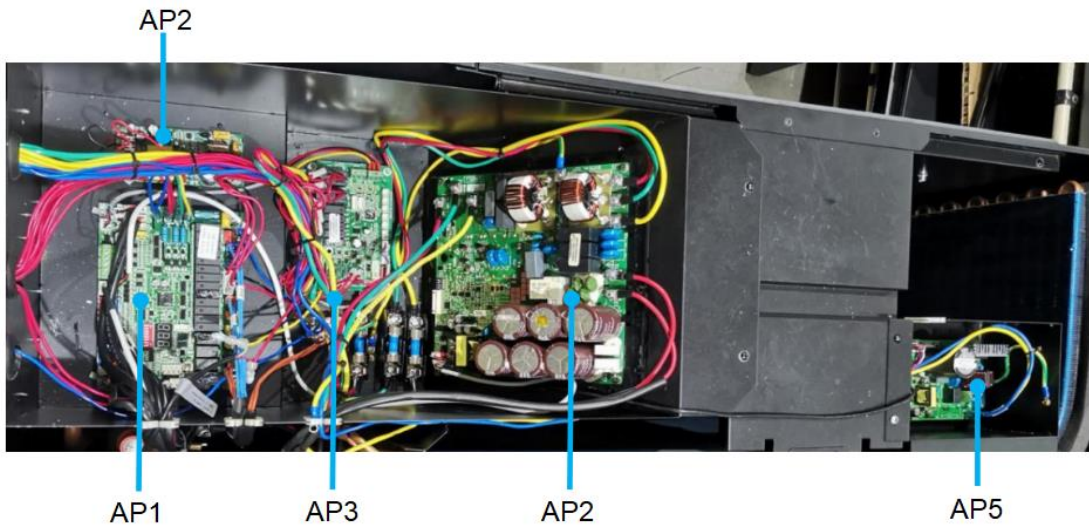


### 1.3.2.4 MMHP-012B2/MMHP-016B2



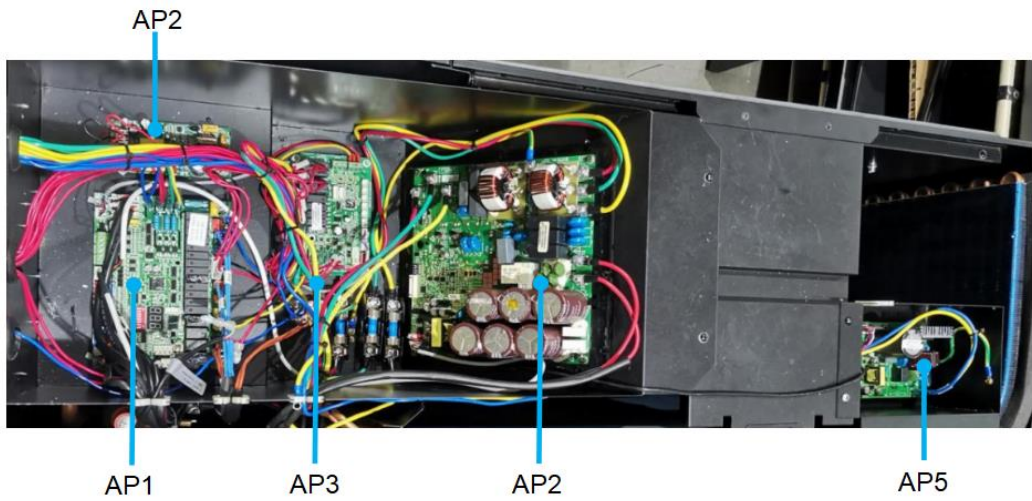
No.	Description
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board
AP5	Fan Driver Board

### 1.3.2.5 MMHP-020B2



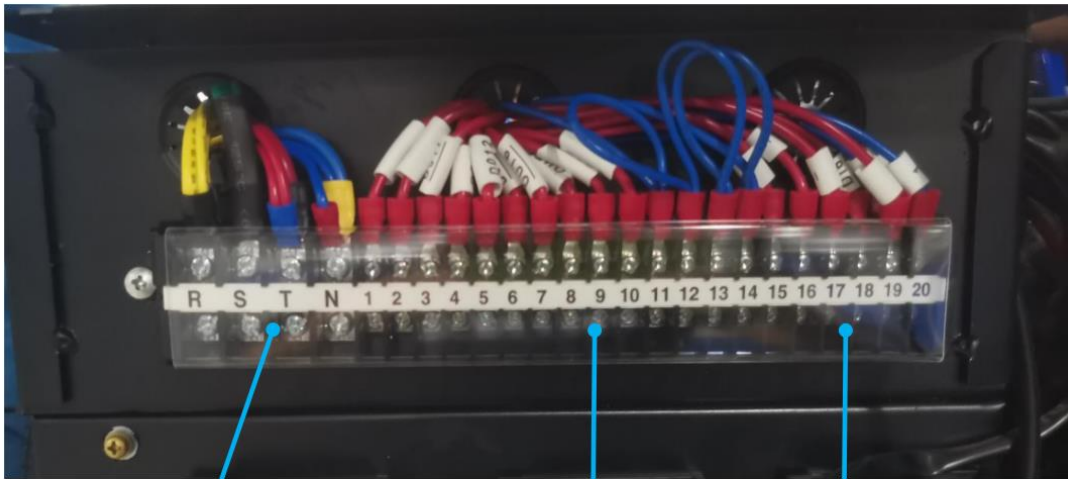
No.	Description
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board
AP5	Fan Driver Board

### 1.3.2.6 MMHP-026B2



No.	Description
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board
AP5	Fan Driver Board

1.3.2.7 MMHP-008B1/MMHP-012B1/MMHP-016B1/MMHP-020B1



Power input 400VAC

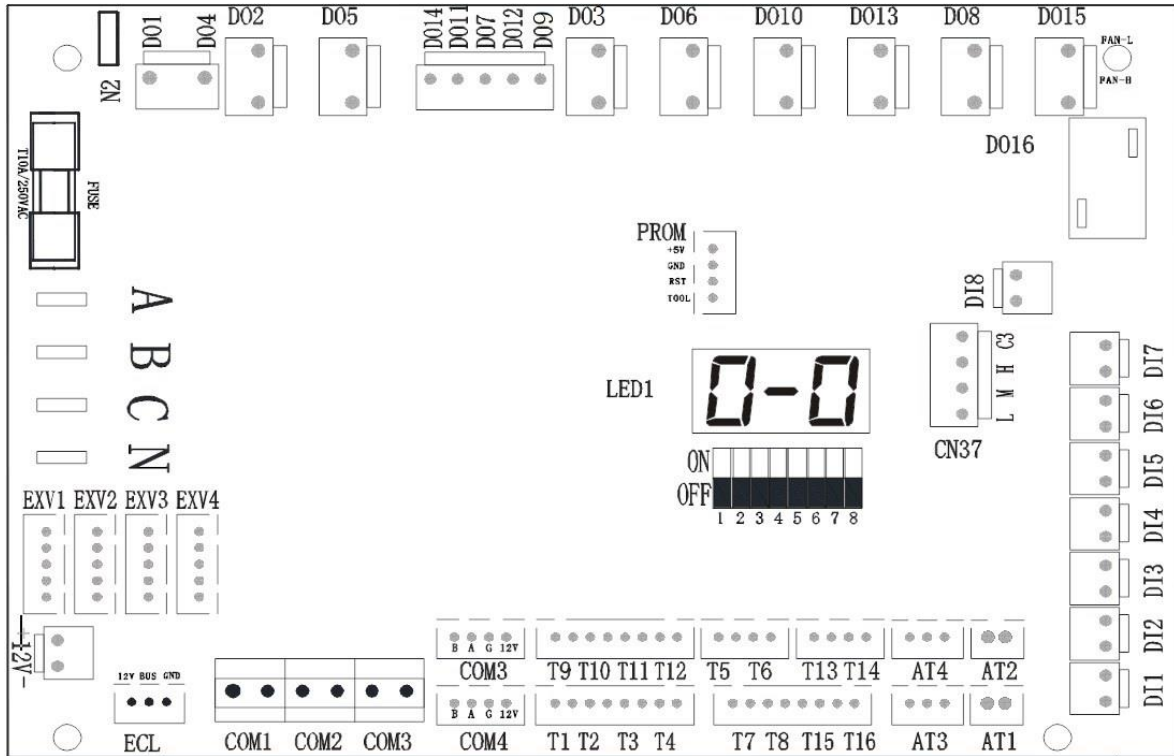
1-14: 230VAC

15-20: DC12V



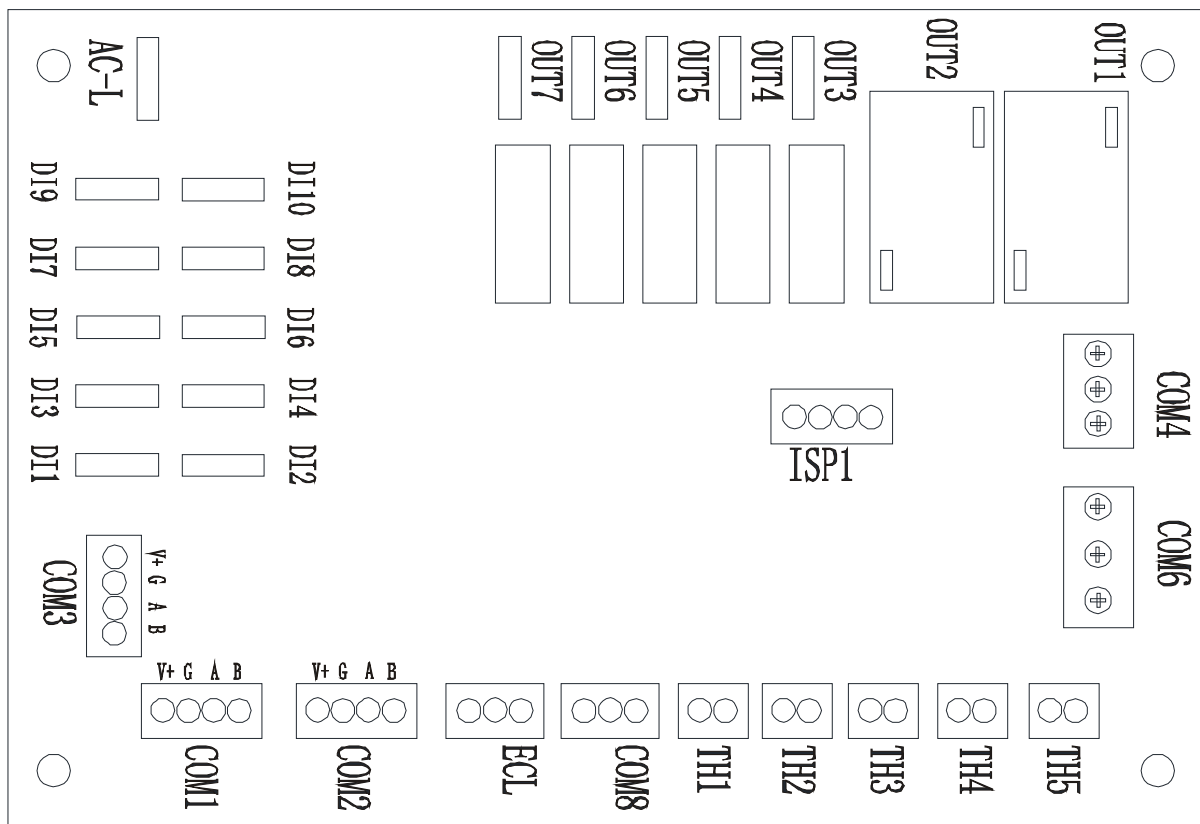
### 1.3.3 Motherboard Port Definition

#### 1.3.3.1 AP1- Motherboards



Port	Description	Port	Description	Port	Description
D01	P_h#Zone 2 Water Pump	DI3	Water Flow Switch	A	Power Input R
D02	4-Way Valve	DI2	Low Pressure Switch	AI3	Low Pressure Sensor
D03	Injection Valve	DI1	High Pressure Switch	T1	Outer Coil Temp. Sensor
D04	Bypass Valve	C3	COM	T2	Suction Temp. Sensor
D05	SV3#Mixing Valve (Close)	H	SG Signal	T3	Exhaust Temp. Sensor
D06	SV3# Mixing Valve (Open)	M	EVU Signal	T4	Cooling Coil Temp. Sensor
D07	Crankshaft Heater	L	Reserve	T5	Economizer Inlet Temp. Sensor
D08	Chassis Heater	AI2	Reserve	T6	Economizer Outlet Temp. Sensor
D09	EH2# Electric Heater (Buffer Tank)	AI1	Reserve	T7	Ambient Temp. Sensor
D010	EH3#: Electric Heater (Expansion Tank)	AI4	High Pressure Sensor	T8	Water Inlet Temp. Sensor
D011	P_e# AHS Water Pump	COM3	Driver Module	T9	Total Water Outlet Temp. Sensor
D012	P_d# DHW Return Water Pump	COM4	Wire Controller	T10	Buffer Tank Temp. Sensor
D013	EH4#: Electric Heater (Plate Heat Exchanger)	COM3	Reserve	T11	Zone 2 Temp. Sensor
D014	EVI Valve	COM2	Host Unit Monitor	T12	Solar Water Heater Temp. Sensor
D015	Fan Low / High Wind	COM1	Cascade Module	T13	DHW Return Temp. Sensor
D016	P_c# Auxiliary Water Pump	ECL	Expansion Module	T14	Anti-Freeze Temp. Sensor
C2	COM 1	12V	DC 12V	T15	Water Outlet Temp. Sensor
C1	COM 2	EXV1	Main EEV	T16	DHW Tank Temp. Sensor
DI8	Middle Pressure Switch 1	EXV2	EVI EEV	LED1	Digital Tube
DI7	Reserve	C	Power Input T	SW1	DIP Switch
DI6	Linkage Switch	B	Power Input S	N	Null Line

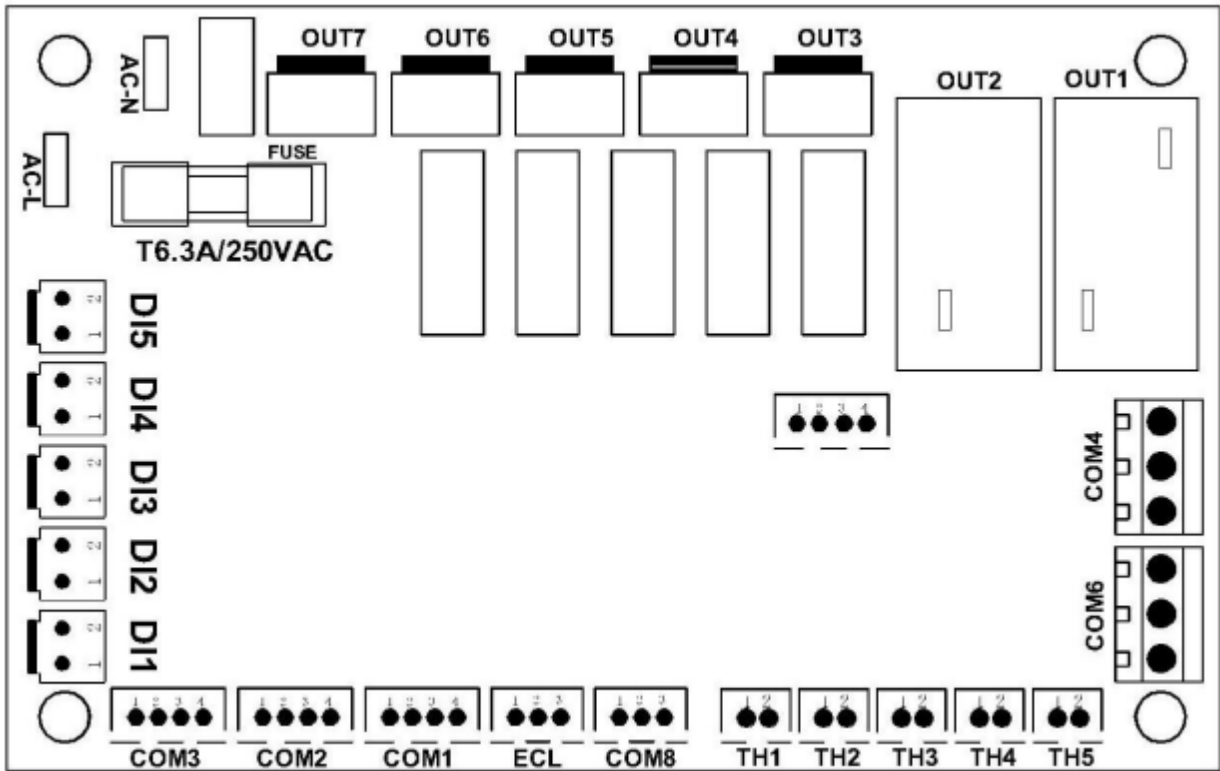
### 1.3.3.2 AP3- Water Pump Expansion Board



Port	Description	Port	Description
OUT1	Built-in Water Pump	DI5	GND
OUT2	P_b# Heating/Cooling Water Pump	DI6	Linkage Switch (External Water Pump)
OUT3	SV2# 3-Way Valve (to Heating)	DI7	GND

OUT4	SV2# 3-Way Valve (to Cooling)	DI8	Reserve
OUT5	SV1# 3-Way Valve (DHW)	DI9	GND
OUT6	SV1# 3-Way Valve (Buffer Tank)	DI10	Reserve
OUT7	EH1#/AHS Singal Output	TH1	Reserve
COM3	RS485	TH2	Reserve
COM2	RS485	TH3	Reserve
COM1	RS485	TH4	Reserve
AC-L	Power Input L	TH5	Reserve
DI1	GND	COM8	Reserve
DI2	Linkage Switch (Heat Source of DHW)	ECL	Motherboard Communicate Port
DI3	GND	COM4	P_b Water Pump PWM Port
DI4	Linkage Switch (Heat Source of Heating Side )	COM6	P_a Water Pump PWM Port

### 1.3.3.3 Spare Motherboard



Port	Description	Port	Description
OUT1	Bulit-in Water Pump	DI5	Reserve
OUT2	P_b# Heating/Cooling Water Pump	DI4	Forced Cooling Switch
OUT3	SV2# 3-Way Valve (to Heating)	DI3	Linkage Switch (External Water Pump)
OUT4	SV2# 3-Way Valve (to Cooling)	DI2	Forced Heating Switch
OUT5	SV1# 3-Way Valve (DHW)	DI1	Linkage Switch (Heat Source of DHW)
OUT6	SV1# 3-Way Valve (Buffer Tank)	TH1	Reserve
OUT7	EH1#/AHS Singal Output	TH2	Reserve
COM3	RS485	TH3	Reserve
COM2	RS485	TH4	Reserve

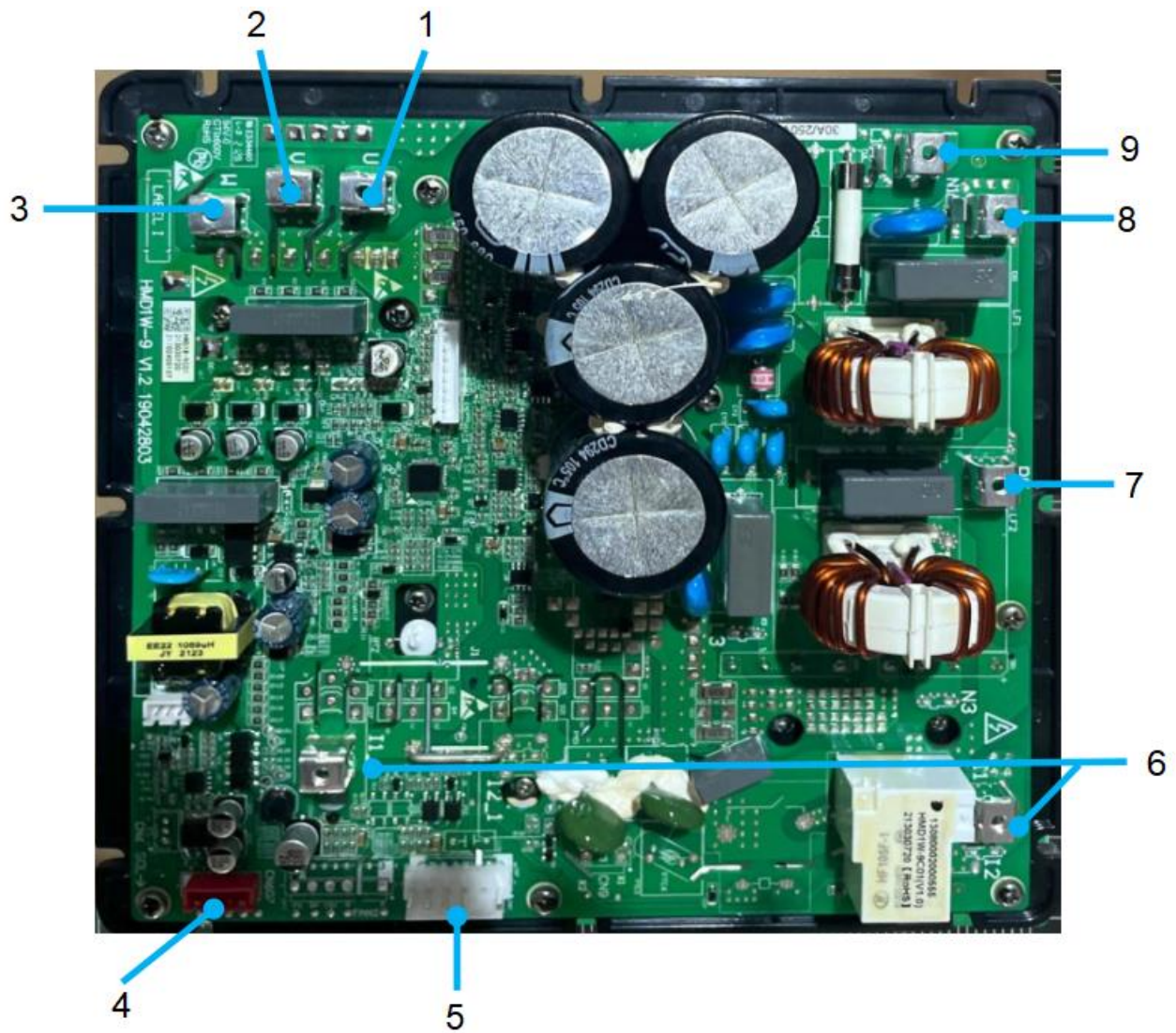
COM1	RS485	TH5	Reserve
AC-L	Power Input L	COM8	Reserve
AC-N	Power Input N	ECL	Motherboard Communicate Port
		COM4	P_b Water Pump PWM Port
		COM6	P_a Water Pump PWM Port

### 1.3.3.4 AP4- Power Supply Board

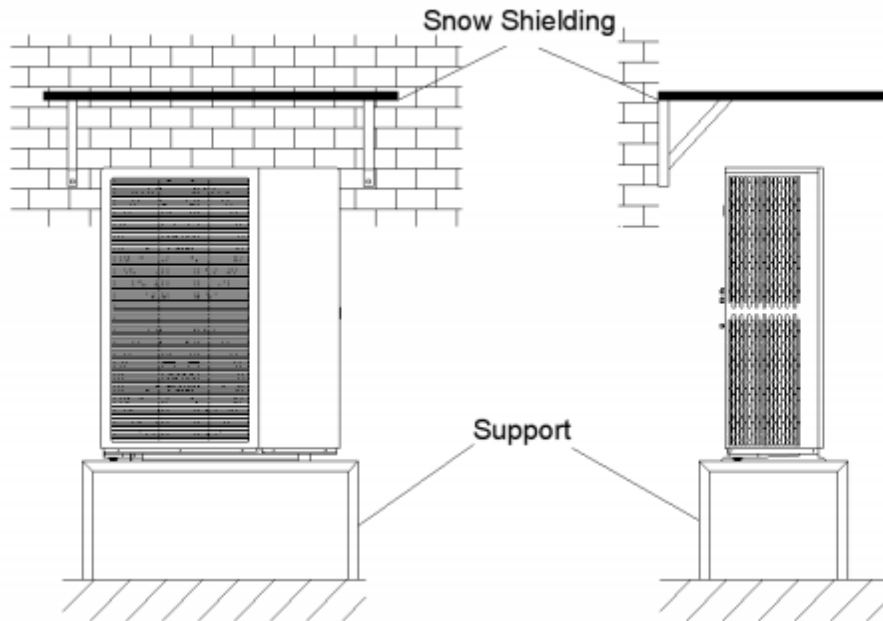


No.	Description
1	Fuse
2	Power Supply
3	Secondary Power Supply 1 (DC12V)
4	Secondary Power Supply 2 (DC12V)

### 1.3.3.5 AP2- Compressor Drive Board



Model	No.	Description
MMHP-008B1 MMHP-012B1	1	Compressor Output U
	2	Compressor Output V
	3	Compressor Output W
	4	RS485(to AP1)
	5	Fan
	6	Reactors
	7	PE
	8	Power Supply N (VAC230)
	9	Power Supply L (VAC230)



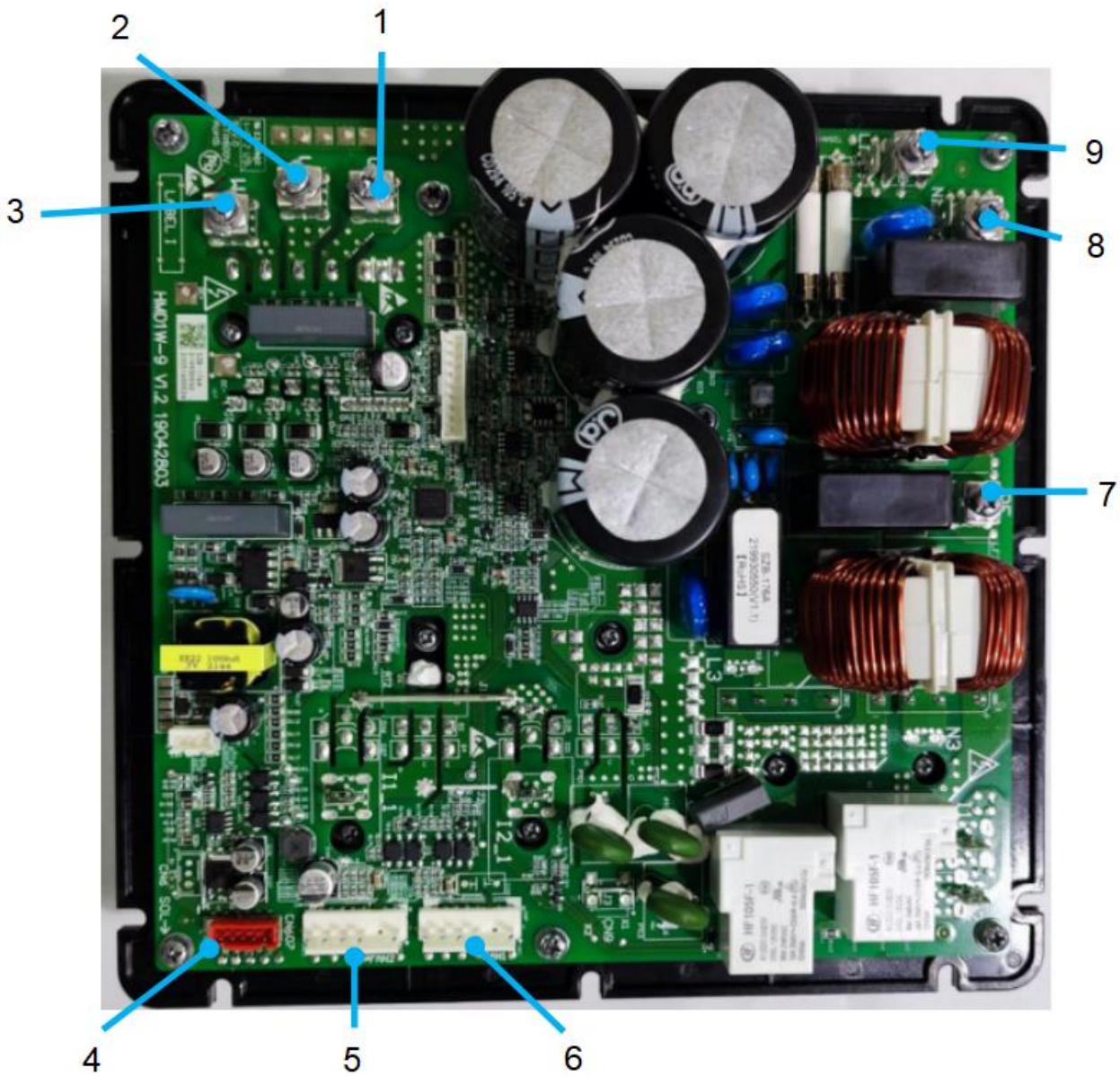
### 2.3.1.4 Hot Climate Installation

As the outdoor temperature is measured via the outdoor ambient temperature sensor, make sure to install the unit in the shade, or a canopy should be constructed to avoid direct sunlight. So that it is not influenced by the sun's heat, otherwise system protection may occur.

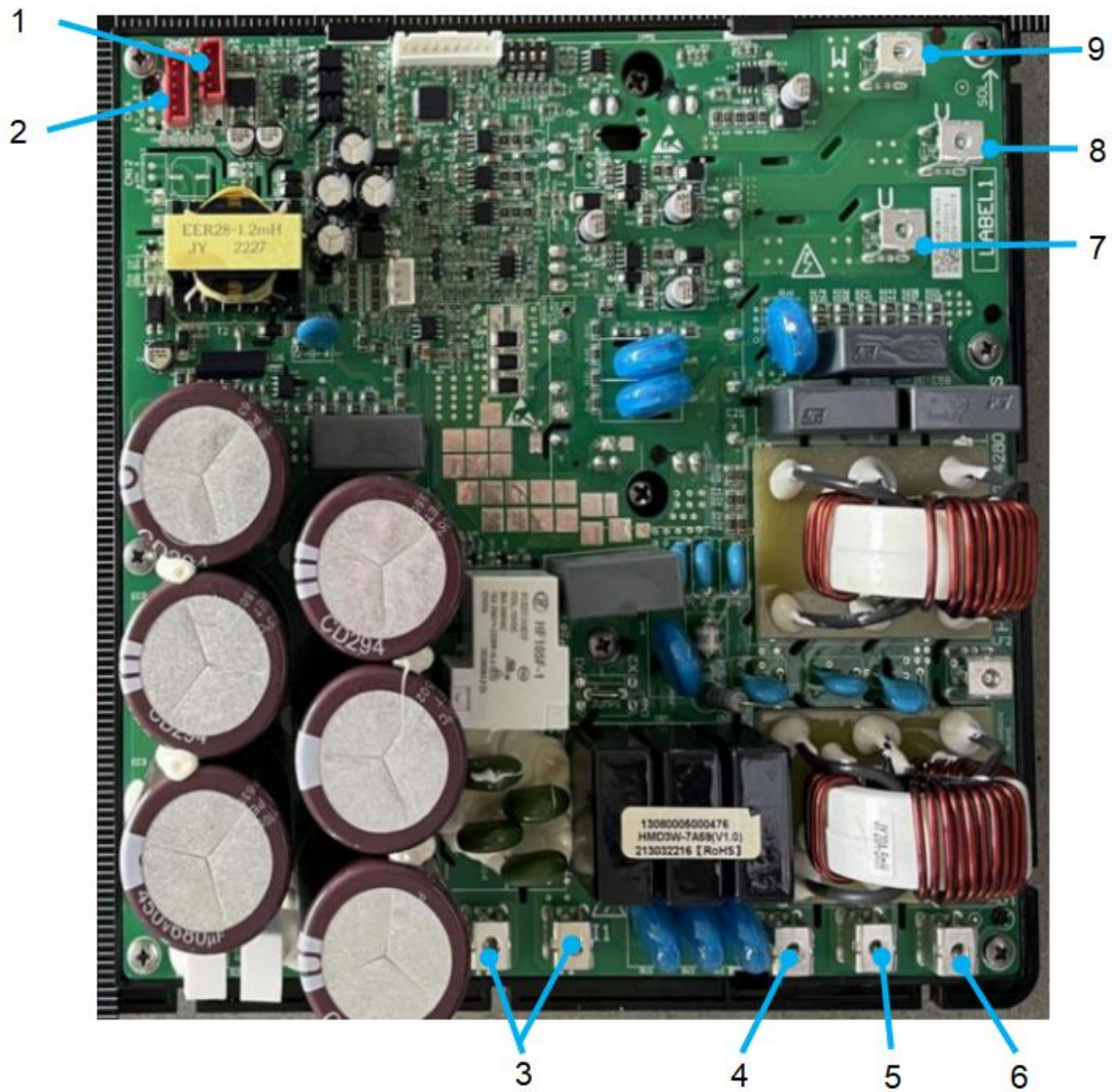
### 2.3.1.5 Base Mounting Requirements

Outdoor unit base structure design should take account of the following considerations:

- A solid base prevents excess vibration and noise. Outdoor unit bases should be constructed on solid ground or on structures of sufficient strength to support the unit's weight.
- Base should be at least 100mm high to provide sufficient drainage and to prevent water ingress into the base of the unit.
- Either steel or concrete bases may be suitable.
- Outdoor units should not be installed on supporting structures that could be damaged by water built-in in the event of a blocked drain.
- Fix the unit securely to foundation by means of the  $\Phi 10$  expansion bolt. It is best to screw in the foundation bolts until their length is 20mm from the foundation surface.



Model	No.	Description
MMHP-016B1 MMHP-020B1	1	Compressor Output U
	2	Compressor Output V
	3	Compressor Output W
	4	RS485(to AP1)
	5	2#Fan
	6	1#Fan
	7	PE
	8	Power Supply N (VAC230)
	9	Power Supply L (VAC230)



Model	No.	Description
MMHP-020B2 MMHP-026B2	1	RS485(to AP5)
	2	RS485(to AP1)
	3	Reactors
	4	Power Supply R (VAC380)
	5	Power Supply S (VAC380)
	6	Power Supply T (VAC380)
	7	PE
	8	Compressor Output U
	9	Compressor Output V
	10	Compressor Output W



### 1.3.4 Built-in Temperature Sensors

Built-in temperature sensor needs to be enabled by dip switch or parameter.

No.	Sensor Type	Color/Spec.	Setting	Refer to	Note
T9	Total Water Outlet Temp.	Black/5K	DIP Switch	1.3.5.2	Disable (Default)
T10	Buffer Tank Temp.	Green/5K	DIP Switch	1.3.5.2	Disable by default
T11	Zone 2 Water Temp.	Yellow/5K	P257	2.7.5	Disable by default
T12	Solar Water Temp.	Orange/5K	P151/P152	2.7.3.5	Disable by default
T13	Return Water Temp.	Red/5K	L22	2.7.3.4	Disable by default
T16	DHW Tank Temp.	Blue/5K	P48	2.6.1.3	Disable by default

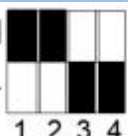
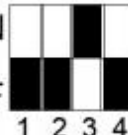
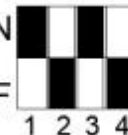
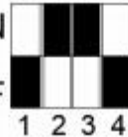

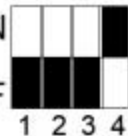



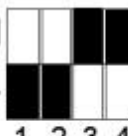
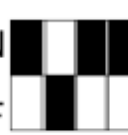
### 1.3.5 DIP Switch Definitions

DIP Switch Type	Functions	Status
SW1	Setting the Master and Slave Addresses	<p>ON: All 4 switches (1, 2, 3, 4) are up.</p> <p>OFF: All 4 switches (1, 2, 3, 4) are down.</p>
SW2	Setting Unit Functions	<p>ON: Switches 1, 2, 3, 4 are up.</p> <p>OFF: Switches 5, 6, 7, 8 are down.</p>

#### 1.3.5.1 SW1 Definitions

Address setting combinations for master and slave:

No.	SE1	SE2	SE3	SE4	Status
Master	OFF	OFF	OFF	OFF	<p>ON: All 4 switches (1, 2, 3, 4) are up.</p> <p>OFF: All 4 switches (1, 2, 3, 4) are down.</p>
Slave1	ON	OFF	OFF	OFF	<p>ON: Switch 1 is up.</p> <p>OFF: Switches 2, 3, 4 are down.</p>
Slave2	OFF	ON	OFF	OFF	<p>ON: Switch 2 is up.</p> <p>OFF: Switches 1, 3, 4 are down.</p>

No.	SE1	SE2	SE3	SE4	Status
Slave3	ON	ON	OFF	OFF	ON  OFF 1 2 3 4
Slave4	OFF	OFF	ON	OFF	ON  OFF 1 2 3 4
Slave5	ON	OFF	ON	OFF	ON  OFF 1 2 3 4
Slave6	OFF	ON	ON	OFF	ON  OFF 1 2 3 4
Slave7	ON	ON	ON	OFF	ON  OFF 1 2 3 4
Slave8	OFF	OFF	OFF	ON	ON  OFF 1 2 3 4
Slave9	ON	OFF	OFF	ON	ON  OFF 1 2 3 4
Slave10	OFF	ON	OFF	ON	ON  OFF 1 2 3 4
Slave11	ON	ON	OFF	ON	ON  OFF 1 2 3 4
Slave12	OFF	OFF	ON	ON	ON  OFF 1 2 3 4
Slave13	ON	OFF	ON	ON	ON  OFF 1 2 3 4

No.	SE1	SE2	SE3	SE4	Status
Slave14	OFF	ON	ON	ON	ON <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> OFF <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4
Slave15	ON	ON	ON	ON	ON <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4

### 1.3.5.2 SW2 Definitions

Function	SE5
O(None)	ON/OFF
O(None)	ON/OFF

Function	SE6	Status
Enable Buffer Tank Temp. Sensor	ON	ON <input checked="" type="checkbox"/> OFF <input type="checkbox"/> 6
Disable Buffer Tank Temp. Sensor	OFF (default)	ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/> 6

Function	SE7	Status
Enable Total Water Outlet Temp. Sensor	ON	ON <input checked="" type="checkbox"/> OFF <input type="checkbox"/> 7
Disable Total Water Outlet Temp. Sensor	OFF (default)	ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/> 7

Function	SE8	Status
Three-phase models	ON	ON <input checked="" type="checkbox"/> OFF <input type="checkbox"/> 8
Single-phase models	OFF	ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/> 8

## 2 Installation

### 2.1 Precautions Before Installation

1. The heat pump cooling and heating water system should be a closed system, if using antifreeze or other refrigerant, please consult the manufacturer;
2. A filter must be installed in front of the inlet pipe of the heat pump unit with a mesh of 40 mesh or more;
3. The filter mesh in the filter must be made of stainless steel to avoid impurities entering the system after the filter mesh is corroded and causing scratches to the heat exchanger. This heat pump adopts non-toxic flammable and explosive refrigerant, when installing, install it in the outdoor ventilation place, away from open fire.

#### 2.1.1 Disclaimer

1. This product must use the copper-core power supply line that meets the required wire diameter to supply power independently, and the unit needs to have a reliable grounding wire; if the wiring does not meet the requirements, causing the unit not to work properly, the manufacturer will not be held responsible for this.
2. When cleaning the unit, you must stop the machine and cut off the power switch; if the unit is running with electricity for cleaning, causing electric shock and personal safety injuries, the manufacturer will not be responsible for this.
3. In winter or when the ambient temperature is below 2°C, if the machine is shut down for a long time and not in use, please make sure to empty the water in the water circuit and water tank to prevent the water from freezing and expanding, which will crack the water circuit and water tank and damage the machine. If the unit is damaged by freezing due to power failure and stopping the antifreeze protection of the unit, the manufacturer will not be responsible for this.

#### 2.1.2 Warning

1. Before installation, it should be confirmed that the voltage of the power grid is the same as the required voltage of the unit, and whether the through-load capacity of the wires and sockets meets the maximum power requirements.
2. If the standing appliance is not equipped with power cord and plug, and there is no other device to disconnect the power supply (its contact opening distance provides a full disconnection under overvoltage class III), the fixed wiring connected to it must be equipped with an all-pole disconnecting earth leakage protection device with a contact opening distance of more than 3mm in accordance with the rules of wiring.
3. Please commission the dealer or professional installation; the installer must have the relevant professional knowledge, self-installation, if the wrong operation will lead to water leakage, fire, electric shock, injuries and so on.
4. Make sure to use our designated products for locally purchased auxiliary items;
5. When connecting the power supply, please comply with the regulations of the local electric company; confirm whether it is correctly grounded or not, if the grounding is not perfect, it may cause electric shock to the personnel.
6. When the heat pump unit needs to be moved or re-installed, please entrust the dealer or professional personnel to operate; if the installation is not perfect, it may cause the unit operation failure.

If the installation is not perfect, it may cause accidents such as operation failure, electric shock, fire, injury, water leakage and so on.

7. Never modify and repair the unit by yourself, improper repair may cause water leakage, fire, electric shock, injury and other accidents, please entrust the dealer or professional personnel to repair the unit.

8. Do not remove any permanent instructions, labels or nameplates on the inside of the heat pump unit casing or various panels.

### 2.1.3 Precaution

1. The power supply wiring must be equipped with a leakage protector whose rated current value is not lower than the high operating current of the unit, and the grounding must be reliable and kept dry to prevent leakage. Please always check the wiring is good with, if the contact is poor, it will lead to overheating and burn the device, and even cause fire and other personal injury accidents.

2. In the place where water may splash to and on the wall, the installation height of the power socket should not be lower than 1.8 meters, and make sure that the water will not splash to the socket and should not be installed in the place where children may reach.

3. During the heating period, there may be water droplets dripping from the pressure relief hole of the pressure safety valve, which is a normal phenomenon, if there is a large amount of water leakage, please find a professional to repair in time, and never block the pressure relief hole, so as not to cause damage to the heat pump unit, resulting in safety accidents. The drainpipe connected to the pressure relief hole should be kept downward sloping installed in a frost-free environment.

4. If the unit is equipped with a power cord, the power cord must be replaced with a special power cord provided by the manufacturer when it is damaged and replaced by the manufacturer or the manufacturer's service organization or similar qualified professional maintenance personnel;

5. If the parts of the unit are damaged, please leave them to professional maintenance and use the special maintenance parts provided by the Company.

6. If the heat pump unit has not been used for a long period of time (more than 2 weeks), hydrogen gas may be generated in the hot water piping system, which is extremely flammable. In this case, to minimize the risk, it is recommended that the hot water faucet be turned on for a few minutes' time prior to the use of any electrical appliance connected to the hot water system. If hydrogen gas is present, then when the water begins to flow, it will make an unusual sound like air going through the pipes. Do not smoke or light an open flame near the faucet during the turn-on period.

7. Do not stick your fingers, sticks, etc. into the air outlet or air inlet. This is because the internal wind wheel operates at high speed and may cause Injury.

8. When an abnormality occurs (burning odor), you should immediately cut off the manual power switch, stop running, and contact the manufacturer's after-sales service department.

contact with the manufacturer's after-sales service department. If it continues to operate abnormally, it may cause electric shock or fire.

9. It should not be installed in the place where flammable gas is easy to leak. In case of flammable gas leakage, it may cause fire around the unit.

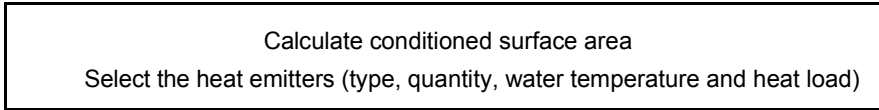
If flammable gas leaks, a fire may break out in the vicinity of the unit.

10. Make sure that the installation foundation is firm for long-term use. If the foundation is not solid, there is a possibility of falling and injuring someone.

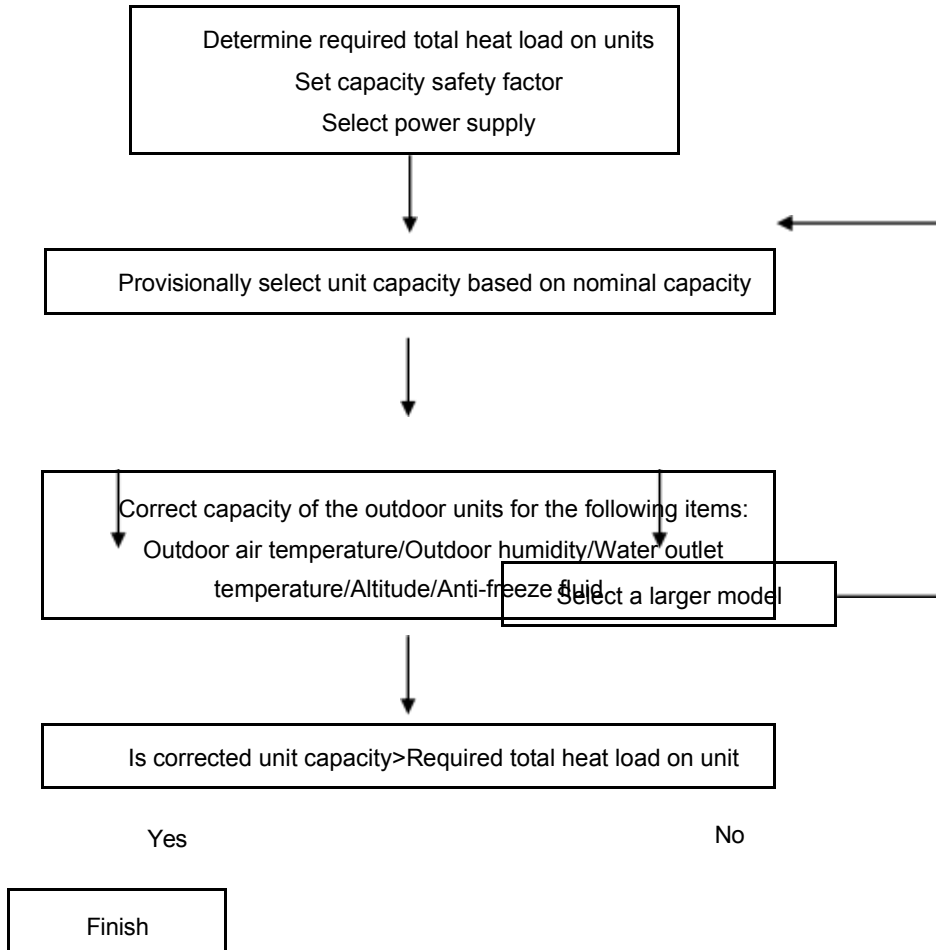


## 2.2 Heat Pump Selection Guide

Step 1: Total heat load calculation



Step 2: Selection of Units



## 2.3 Installation Requirements

### 2.3.1 Installation Location Requirements

Please comply with the following rules concerning the choice of heat pump location.

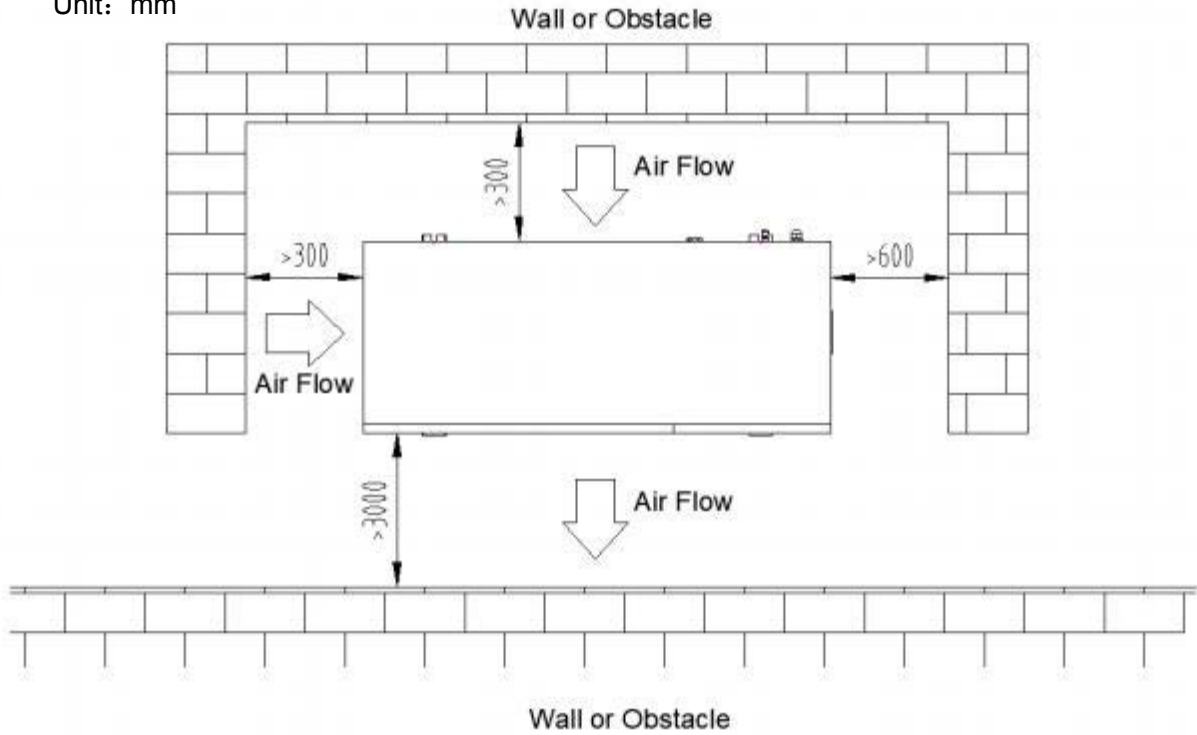
1. The unit's future location must be easily accessible for convenient operation and maintenance.
2. It must be installed on the ground, fixed ideally on a level concrete floor. Ensure that the floor is sufficiently stable and can support the weight of the unit.
3. A water drainage device must be provided close to the unit to protect the area where it is installed.

- 4.If necessary, the unit may be raised by using suitable mounting pads designed to support its weight.
- 5.Check that the unit is properly ventilated, that the air outlet is not facing the windows of neighboring buildings and that the exhaust air cannot return. In addition, provide sufficient space around the unit for servicing and maintenance operations.
- 6.The unit must not be installed in an area exposed to oil, flammable gases, corrosive products, Sulphur compounds, or close to high-frequency equipment.
- 7.To prevent mud splashes, do not install the unit near a road or track.
- 8.To avoid causing a nuisance to neighbors, make sure the unit is installed so that it is positioned towards the area that is least sensitive to noise.
- 9.Keep the unit as much as possible out of the reach of children.

### 2.3.1.1 Single Installation Requirements

Installation space:

Unit: mm

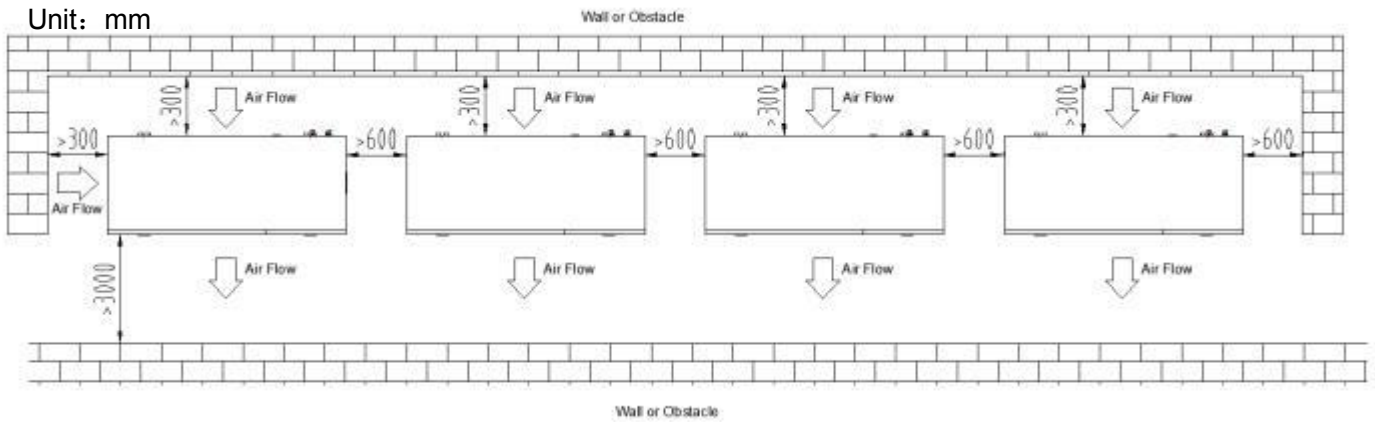


### 2.3.1.2 Cascade Installation Requirements

The unit shall be installed in a place with air circulation, no heat radiation or other heat sources, and the allowable minimum distance between the unit and the surrounding walls or other shelters is:

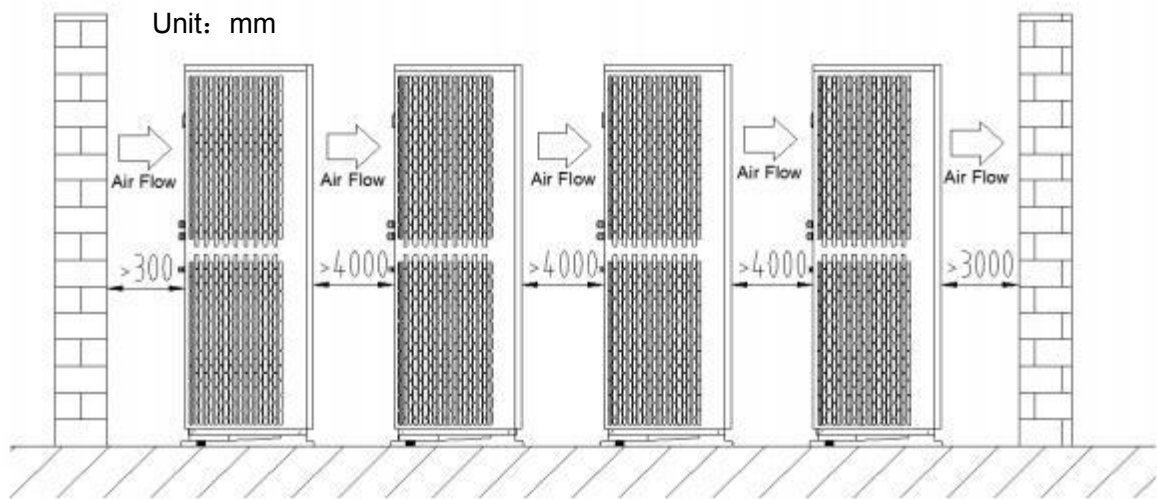
Installation Type 1 : the distance between the air inlet surface and the wall is more than 300 mm, the distance between every 2 units is more than 600 mm, as shown in the figure:

Unit: mm

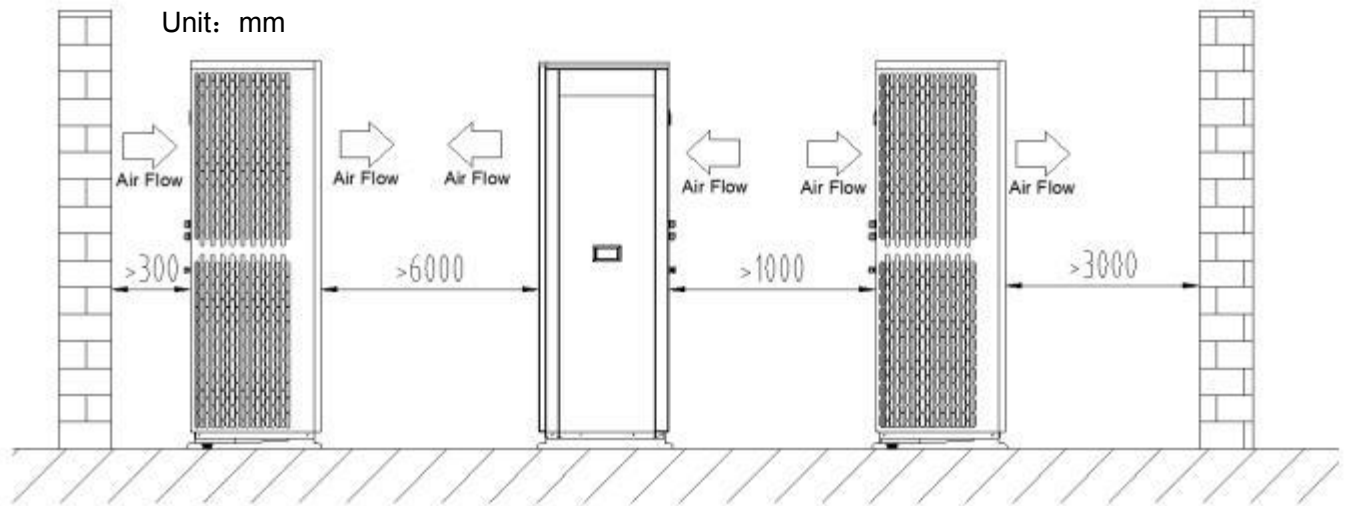


Installation Type 2 : the distance between the air inlet surface and the wall is more than 4000 mm, the distance between every 2 units is more than 4000 mm, as shown in the figure:



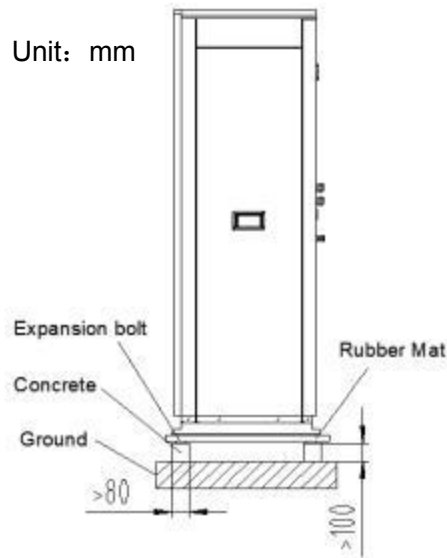


Installation Type 3 : the distance between the air inlet surface and the air inlet surface is more than 300 mm, the distance between every 2 units is more than 4000 mm, as shown in the figure:



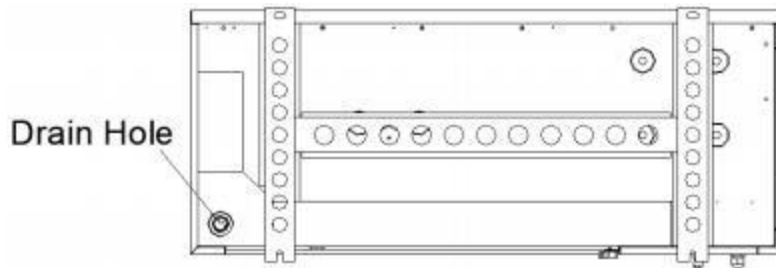
### 2.3.1.3 Cold Climate Installation

In snowy areas, anti-snow facilities shall be installed. In order not to be affected by snow, an elevated platform is adopted, and an anti-snow shed is installed at the air inlet and air outlet.

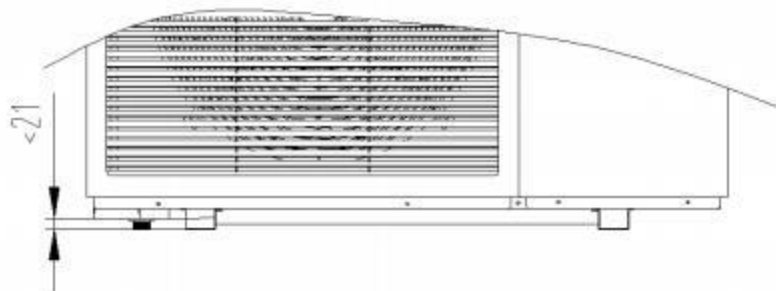


### 2.3.2 Drainage Pipe Installation Requirements

The unit's drain holes are designed for uniform drainage treatment, and condensate will be generated when the unit is running in heating mode or hot water mode. Therefore, when installing the unit, make sure that there is enough space in the drain hole for condensate to be discharged.



Unit: mm

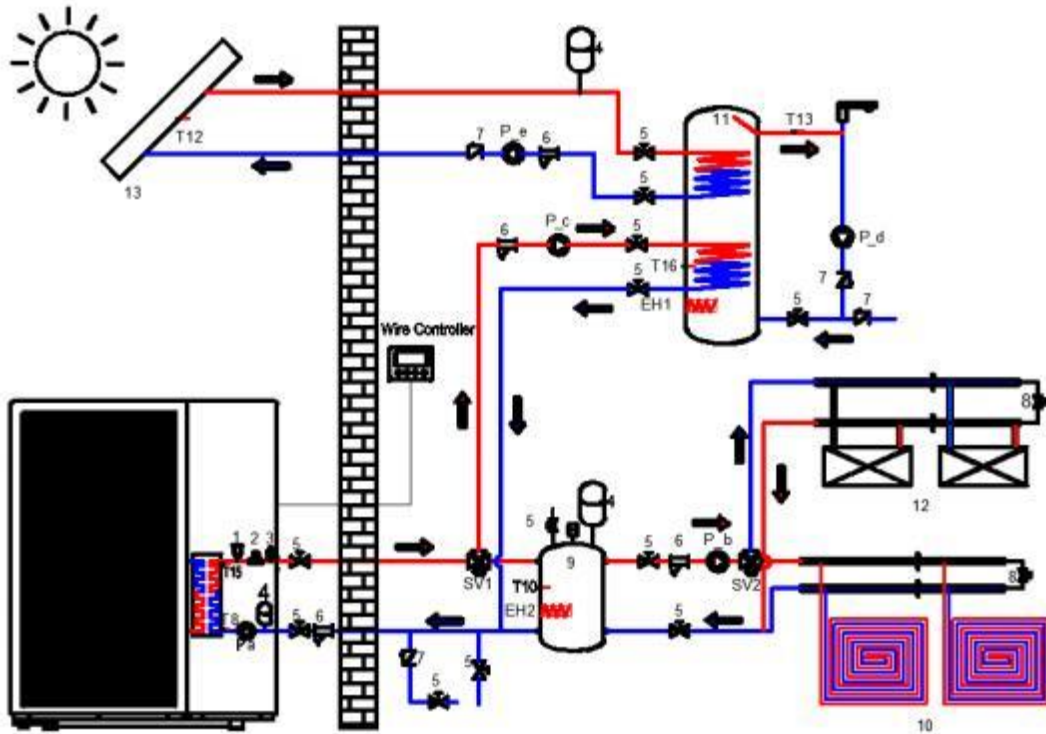


When installing the drain spout, pay attention to the distance of the chassis from the footing

## 2.4 Water System Installation

### 2.4.1 Precaution

### 2.4.1.1 Installation Diagram



**NOTE:**

- The layout of the same program water pipe is conducive to the uniform distribution of water flow.
- The system shall be installed with automatic water refill valve, and the highest point shall be installed with automatic exhaust valve.
- The drain valve is installed at the bottom of the pipeline, which is conducive to drainage.
- Automatic exhaust valve installed in the system pipe at the highest point and the installation of the water pipe must be expanded.
- Suitable water capacity in the water system can ensure the unit defrosting in winter.
- The unit has a built-in water flow switch, which does not need to be added during installation.
- To conveniently maintain the unit, the outlet pipe of the unit needs to be installed with a pressure gauge.
- If the floor heating is used for temperature control in separate rooms and the number of collector and distributor paths in the smallest area is less than or equal to 2, a differential pressure bypass valve is added in accordance with the schematic diagram.
- If the unit does not run in winter, the water inside the system must be drained to prevent freezing of the piping or components.

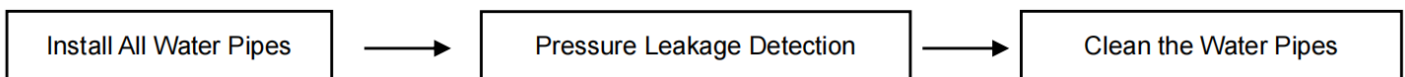
### 2.4.1.2 Water Quality Requirement

- Poor water quality will produce more scale and sand and other sediments. Therefore, the water must be filtered and softened with water softening equipment before flowing into the water system.

- Before using the unit, the water quality should be analyzed, such as PH value, electrical conductivity, chlorine ion concentration, sulfur ion concentration and so on.
- The following are the applicable water quality standards for this unit.

PH Value	Hardness	Conductivity	Sulfur ions	Chloride ion	Ammonia ion
7~8.5	7~8.5	7~8.5	7~8.5	7~8.5	7~8.5
Sulfate ion	Sulfate ion	Sulfate ion	Sulfate ion	Sulfate ion	Sulfate ion
<50ppm	<30ppm	<0.3ppm	No requirement	No requirement	/

### 2.4.1.3 Steps for Installing Water Pipe



### 2.4.1.4 Water Pressure Regulation Requirements

- Before the test, the pipeline should be fixed, the joints need to be laid openly, and should not be connected to the water distribution apparatus.
- The pressure gauge is installed in the lowest part of the test pipe section, and the pressure accuracy is 0.01Mpa.
- From the lowest pipe section slowly to the pipeline water, fully exclude the air inside the pipeline, water tightness test.
- Slowly pressurize the pipeline, pressurization is appropriate to use a hand pump, pressurization time is not less than 10Min.
- After pressurizing to the specified test pressure, stabilize the pressure for 1 hour, the pressure drop shall not exceed 0.06Mpa.
- In the working pressure of 1.15 times the state, stable pressure for 2 hours, the pressure drop shall not exceed 0.03Mpa.
- During the test, there shall be no leakage at each connection.
- Within 30 minutes, allow two times to make up the pressure, up to the specified test pressure.

### 2.4.2 Buffer Tank Selection

Water heating system needs to consider the impact of the system water capacity on the stability of the system, for air source heat pump heating system, the biggest influence factor is the winter unit defrost. Air source heat pump unit defrost time is 3-8min, take the defrost time 4min to calculate the storage tank volume, winter operation, the host defrost time 4min, the water supply temperature is allowed to reduce no more than 3 C.

In the water system back to the main water tank installed on the buffer, used to buffer the water system temperature fluctuations. Buffer tank is pressurized, the maximum working pressure  $\geq 7$ bar, the size of the pipe opening according to the main water pipe line

Selection calculations:

Total water volume of heating system V1:

$$V1 = \frac{Q \times t}{C \times \Delta T}$$

Formula in:

Q -- Rated heating capacity of the unit, unit: kW

$\Delta T$  -- Difference in water temperature (take 3°C), unit: C

t -- Unit defrost time (take 240s)

C -- Specific heat capacity of water (take 4.2 (kJ / (kg · C) ))

Total water volume of heating system V2:

$$V2 = \frac{\pi \times d^2 \times L}{4000}$$

Formula in:

$\pi$  -- Circumference (3.14)

d-- Inner diameter of the pipe, unit: m

L -- Total length of the pipe (actual system installation prevails), unit: m

Buffer Tank Selection Recommend:

Model	MMHP-008B1	MMHP-012B1 MMHP-012B2	MMHP-016B1 MMHP-016B2	MMHP-020B1 MMHP-020B2	MMHP-026B1 MMHP-026B2
Recommend Volume (L)	50-70	60-80	70-100	80-120	100-150

### 2.4.3 DHW Tank Inner Coil Selection

Domestic hot water is usually heated using a built-in coil, so the choice of specifications for the internal coil directly affects the heating effect and the reliability of the unit and its operation.

The specifications for the built-in coils are listed below:

Material		SUS316L					20# Steel + Surface Enamel				
Diameter	Smooth Pipe	22	28	28	32	32	22	28	28	32	32
	Corrugated Pipe	22	28	28	32	32	/	/	/	/	/

Selection calculations:

According to the experience smooth pipe unit area heat transfer is 3kW, corrugated pipe unit area heat transfer q is 6KW.

$$S = \frac{Q}{q}$$

Formula in:

S -- Outer surface area of internal coil, unit: m<sup>2</sup>

Q -- Rated heating capacity of the unit, unit: kW

q -- Heat exchange per unit area, unit: kW/m<sup>2</sup>

Coil length calculation L:

$$L = \frac{S}{\pi \times d}$$

Formula in

S -- Outer surface area of internal coil, unit: m<sup>2</sup>

$\pi$  -- Circumference (3.14)

d-- Coil Diameter, unit: m

Calculate the appropriate pipe length according to the above formula.

Note: If corrugated inner coil is used, the resistance loss of water system increases, please pay attention to the reasonable adjustment of circulating water pump head.

## 2.4.4 Other Accessory Selection

### 2.4.4.1 Water Pump

Basic requirements:

- Water pump selection should meet the larger of the flow and head required for the system's winter design heating conditions and summer cooling conditions.
- If the head of the unit's built-in pump is less than the system resistance, an auxiliary pump should be added.
- Use the water system loop with the greatest resistance for hydraulic calculations and select the appropriate circulating water pump based on the total pressure loss, considering the margin.
- **Calculation of water pump head**

Calculate the resistance loss of the underfloor heating pipes and choose the head of the pump. The hydraulic calculation formula for floor heating pipes is.

$$\Delta P = \Delta P_m + \Delta P_j$$

A Calculation of a long-stream resistance

$$\Delta P_m = R * l$$

B Calculation of local resistance

$$\Delta P_j = c \frac{\rho v^2}{2}$$

The above can be calculated in detail by checking the relevant parameters according to the hydraulic calculation table.

It can also be estimated by the following formula:

Lift H = K \* (height difference between the pipeline h (m) + unit water-side pressure loss + the longest pipe length (m) \* 0.07)

Formula in:

**Note:**

- K for the safety factor value of 1.1-1.2; single water system to take 1.1, multi-way water system to take 1.2.
- Water-side pressure loss unit kPa, 10kPa = 1m (H<sub>2</sub>O) head.
- The head of auxiliary water pump in the case of the unit with its own pump should be calculated value minus the corresponding unit pump head.
- **Calculation of water pump flow rate**

Underfloor heating pumps are selected at 1.2 times the total flow rate of the system.

**2.4.4.2 Expansion Tank**

Basic requirements: Rust protection, also suitable for water/glycol (up to 30%) solutions.

Expansion Tank Specification

Volume (L)	2	4	5	8	12	18	19	20
------------	---	---	---	---	----	----	----	----

<b>Preset Pressure (bar)</b>	1.5~3
<b>Maximum Pressure (bar)</b>	10
<b>Connection Diameter (inch)</b>	G3/4"
<b>Maximum working temperature (C)</b>	70

Selection calculations:

$$V = \frac{C \times e}{1 - \frac{P1 + 1}{P2 + 1}}$$

Formula in:

V -- Volume of the expansion tank, unit: L

C -- Total volume of water in the system (including boilers, pipes, radiators, etc.), unit: L

e -- The coefficient of thermal expansion of water (Refer to the following table)

P1 -- Pre-filling pressure of the expansion tank, unit: bar (this pressure cannot be lower than the static pressure of the system at the point of installation of the expansion tank)

P2 -- The maximum pressure of the system operation (i.e., the pressure of the safety valve in the system), unit: bar

<b>The coefficient of thermal expansion of water</b>			
<b>Temperature (°C)</b>	<b>Expansion Coefficient</b>	<b>Temperature (°C)</b>	<b>Expansion Coefficient</b>
0	0.00013	55	0.01447
10	0.00025	60	0.01704
15	0.00085	65	0.01979
20	0.00180	70	0.02269
25	0.00289	75	0.02575
30	0.00425	80	0.02898
35	0.00582	85	0.03236
40	0.00782	90	0.03590
45	0.00984	95	0.03958
50	0.01207	100	0.04342

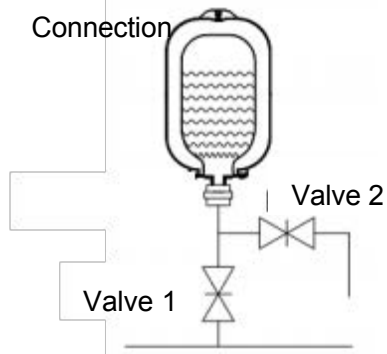
Note: Coefficient of expansion of the volume of water at different temperatures relative to 4°C

**Note:**



- The height difference between the expansion tank and the safety valve needs to be taken into consideration.
- All pressures in the above formula are relative pressures (i.e., gauge pressure), and the selection principle is to select large specifications rather than small specifications.

Expansion tank installation schematic



### 2.4.4.3 Filter

A water filter must be installed in the return port of the heat pump unit, which can reduce the impurities in the pipeline into the unit and protect the normal operation of the unit.

**Basic requirements:** the material is made of brass or stainless steel, brass is recommended, the filter is made of stainless steel, and it is also suitable for water/glycol (up to 30%) solution.

Filter Specification

Connection Diameter	1"F	1.1/4"F	1.1/2"F	2"F
Filter Mesh	40	40	40	40

**Selection suggestions:** the role of the filter for the collection of impurities in the system, to avoid impurities affecting the normal operation of the system. The larger the mesh size of the filter, the finer the size of the impurities that can be filtered, and the smaller the mesh size, the larger the size of the impurities that can be filtered. The size of the filter should be the same as the outer diameter of the main water supply pipe of the system or one specification larger than the outer diameter of the pipe.

**Installation suggestions:** the filter must be installed in a suitable location, the direction of water flow in the system must be the same as the direction of the arrow on the filter, for filters with a drain valve, the drain valve must be down, incorrect installation will probably lead to the inability to eliminate impurities in the filter through the drain valve, and this garbage retained in the filter for a long time will lead to the reduction of the effective area of the filter, the increase of the resistance, and a reduction in the water flow in the system.

### 2.4.4.4 Safe Valve

Safety valves are generally installed in the return side of thermal systems such as air conditioners, boilers, heat pumps and other systems.

**Basic requirements:** the material is made of brass or stainless steel, also suitable for water/glycol (up to 30%) solution.

Safe Valve Specification

Connection Size	1/2"MF	1/2"FF
Setting Pressure (bar)	1.5/2.5/3	

**Selection suggestion:** The safety valve plays a safety protection role in the system, when the system pressure exceeds the maximum value, the safety valve opens and discharges part of the hot water in the system

out of the system, so that the system pressure does not exceed the maximum value, so as to ensure that the system is not over-pressurized, and accidents occur. The setting pressure of the safety valve is consistent with the maximum working pressure of the system. It is generally sufficient to refer to the parameters provided by the equipment provider.

#### **2.4.5 Refill requirements**

- Open the vent valve on the distributor first, as well as all the valves.
- Refill water at the piping refill port.
- In the process of water refilling, it is necessary to observe whether there is water overflow from the exhaust valve, if there is water overflow, it means that the water in the system has been filled.
- Close the exhaust valve, and then observe the water pressure gauge, if it is greater than 0.15Mpa, you can close the refill valve, the waterway air evacuation is complete.

#### **2.4.6 Water Pipe Insulation Requirements**

- All hot water pipes must be wrapped with insulation.
- Wrap the insulation material (e.g., thin aluminum sheet, aluminum foil, etc.) flatly on the pipe that has been wrapped with insulation pipe and wrap the tie.
- The thickness of the insulation pipe should be reasonably selected according to the local climate, DN20 pipe using more than 10MM thickness of insulation cotton; finally wrapping a layer of wrapping tape on the insulation cotton.

#### **2.4.7 Water Pipe Freeze Protection Requirements**

Freezing can cause damage to the circulation system. Care must be taken to prevent the system from freezing as the outdoor unit will be exposed to sub-zero temperatures. All internal fluid circulation components need to be insulated to minimize heat loss. Piping must also be insulated with additional insulation.

In the event of a power failure, the unit's freeze protection will fail. Due to the possibility of power failures when unattended, suppliers recommend the use of antifreeze in the water system.

Depending on the expected minimum outdoor temperature, ensure that the water system is injected with the glycol concentration shown in the table below. The performance of the unit will be affected when glycol is added to the system. Correction factors for system unit capacity, flow rate, and pressure drop are listed in the table.

Glycol Concentration (%)	Correction Factor				Freezing Point (°C)
	Cooling Capacity	Power input	Water Resistance	Water Flow	
0	1.000	1.000	1.000	1.000	0
10	0.984	0.998	1.118	1.019	-4
20	0.973	0.995	1.268	1.051	-9
30	0.965	0.992	1.482	1.092	-16

Propylene Glycol Concentration (%)	Correction Factor				Freezing Point (°C)
	Cooling Capacity	Power input	Water Resistance	Water Flow	
0	1.000	1.000	1.000	1.000	0
10	0.976	0.996	1.071	1.000	-3
20	0.961	0.992	1.189	1.016	-7
30	0.948	0.988	1.380	1.034	-13

Uninhibited glycol becomes acidic under the influence of oxygen. Copper purity and higher temperatures accelerate this process. Acidic uninhibited glycol will eat away at metal surfaces, forming galvanic corrosion cells that can cause serious damage to the system.

This is extremely important:

- water treatment is properly performed by a water specialist who should be qualified.
- Glycols containing corrosion inhibitors are selected to counteract the acids formed by the oxidation of the glycol.
- IF domestic hot water tank is installed, only propylene glycol is permitted. In other installations, the use of ethylene glycol is permitted.
- Automotive glycols are not used because they have a limited corrosion inhibitor life and contain silicates that can contaminate or clog the system.
- Galvanized piping is not used in glycol systems because it can cause precipitation of certain elements in glycol corrosion inhibitors.
- Ensure that the glycol is compatible with the materials used in the system.

## 2.5 Electrical wiring

### 2.5.1 Precautions

- Special outdoor power supply line should be used, and the power supply voltage meets the rated voltage requirement.
- The power supply line of the unit must have a grounding line, and the power supply ground line should be reliably connected with the external grounding line, and the external grounding is effective.
- The user's incoming power supply must be installed with leakage protection device.
- The wiring construction must be connected by professional installation technician according to the circuit diagram.



- The power supply cable and signal cable should be neatly and reasonably arranged, not interfering with each other, not in contact with the connecting pipe and valve body and ensure that the minimum distance between the strong and weak power is more than 25MM.
- The wire controller should be installed in the place where it is easy to observe the operation and should not be installed in the place where there is water and humidity.
- The connection lines in the host have been installed in the factory, the user does not need to connect again, but only need to check whether the connection lines are connected properly, there is no damage or fall off.
- The wire connecting the temperature probe and controller is not long enough to be properly lengthened and connected, with a total length of not more than 20 meters. Note that the connection should be firmly wrapped and waterproof insulation.
- High-voltage side cable: unit power lines, pump power lines, electric heating power lines, solenoid valve power lines, etc. need to use anti-aging, corrosion-resistant power lines suitable for outdoor (H07RN-F type or higher).

**IMPORTANT NOTE: Always ensure that the heat pump power supply is disconnected before carrying out any electrical installation work.**

## 2.5.2 Power Supply Cable Selection

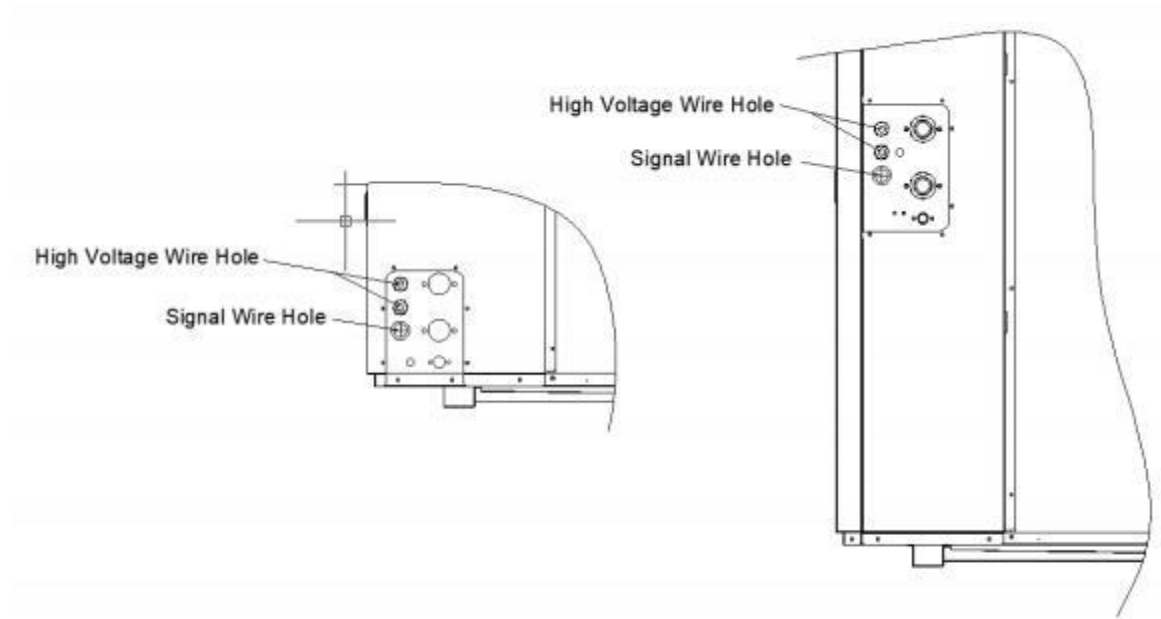
To function safely and maintain the integrity of your electrical system, the unit must be connected to a general electricity supply under the following regulations:

- Upstream, the general electricity supply must be protected by a 30mA differential switch.
- The heat pump must be connected to a suitable D-curve circuit breaker in accordance with current standards and regulations in the country where the system is installed.
- The electricity supply cable must be adapted to match the unit's rated power and the length of wiring required by the installation. The cable must be suitable for outdoor use.
- For a three-phase system, it is essential to connect the phases in the correct sequence. If the phases are inverted, the heat pump's compressor will not work.
- In places open to the public, it is mandatory to install an emergency stop button close to the heat pump.

Model	Power Supply Wires		
	Power Supply	Cable Diameter	Specification
MMHP-008B1	220-240V~/ 50Hz	3 G 4 mm <sup>2</sup>	AWG 12
MMHP-012B1		3 G 4 mm <sup>2</sup>	AWG 12
MMHP-016B1		3 G 4 mm <sup>2</sup>	AWG 12
MMHP-020B1		3 G 6 mm <sup>2</sup>	AWG 10
MMHP-012B2	380V-415V/3N ~/ 50Hz	5 G 4 mm <sup>2</sup>	AWG 12
MMHP-016B2		5 G 4 mm <sup>2</sup>	AWG 12
MMHP-020B2		5 G 6 mm <sup>2</sup>	AWG 10
MMHP-026B2		5 G 6 mm <sup>2</sup>	AWG 10

### 2.5.3 Power Cord Outlet Guidelines


Secure the electrical wiring with cable ties. So that it does not meet the piping.



### 2.5.4 Terminal Block Port Introduction

#### 2.5.4.1 MMHP-008B1/MMHP-012B1/MMHP-016B1/MMHP-020B1



Print	Connect to	Print	Connect to
L	Power Input (220V-240V~/50Hz)	15-20	Forced Cooling Switch
N	Null Line	16-20	Linkage Switch (External Water Pump)
	PE	17-20	Forced Heating Switch
1-N	EH1# Electric Heater (DHW)	18-20	Linkage Switch (Heat Source of DHW)
2-N	P_b# Heating/Cooling Water Pump	19-20	Linkage Switch
3-N	P_c# Auxiliary Water Pump	20	COM
4-N	EH2# Electric Heater (Buffer Tank)	A1-A2	P_h# Mixing Water Pump
5-N	P_d# DHW Return Water Pump	A2	Null Line
6-N	P_e# AHS Water Pump	A3-N	SV3# Mixing Valve (Close)
7-N	SV1# 3-Way Valve (to Buffer Tank)	A4-N	SV3# Mixing Valve (Open)
8-N	SV1# 3-Way Valve (to DHW)	A5-A6	SG Signal
9-N	SV2# 3-Way Valve (to Cooling)	A6	COM
10-N	SV2# 3-Way Valve (to Heating)	A7-A8	EVU Signal
11	Null Line	A8	COM
12	Null Line	A9	Reserve
13	Null Line	A0	Reserve
14	Null Line		

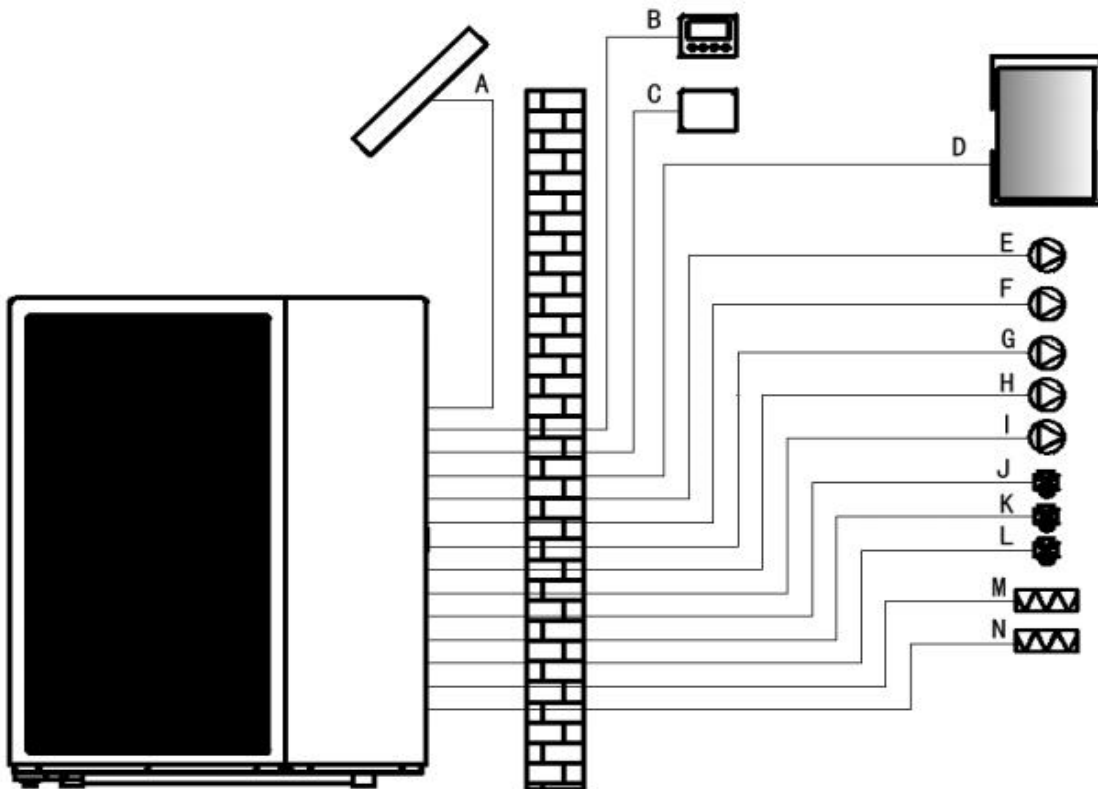
#### 2.5.4.2 MMHP-012B2/MMHP-016B2/MMHP-020B2/MMHP-026B2



Print	Connect to	Print	Connect to
R	Power Input (380V-415V/3N~/50Hz)	14	Null Line
S	Power Input (380V-415V/3N~/50Hz)	15-20	Forced Cooling Switch
T	Power Input (380V-415V/3N~/50Hz)	16-20	Linkage Switch (External Water Pump)
N	Null Line	17-20	Forced Heating Switch
1-N	EH1# Electric Heater (DHW)/AHS	18-20	Linkage Switch (Heat Source of DHW)
2-N	P_b# Heating/Cooling Water Pump	19-20	Linkage Switch
3-N	P_c# Auxiliary Water Pump	20	COM
4-N	EH2# Electric Heater (Buffer Tank) /AHS	A1-A2	P_h# Mixing Water Pump
5-N	P_d# DHW Return Water Pump	A2	Null Line
6-N	P_e# AHS Water Pump	A3-N	SV3# Mixing Valve (Close)
7-N	SV1# 3-Way Valve (to Buffer Tank)	A4-N	SV3# Mixing Valve (Open)
8-N	SV1# 3-Way Valve (to DHW)	A5-A6	SG Signal
9-N	SV2# 3-Way Valve (to Cooling)	A6	COM
10-N	SV2# 3-Way Valve (to Heating)	A7-A8	EVU Signal
11	Null Line	A8	COM
12	Null Line	A9	Reserve
13	Null Line	A0	Reserve

## 2.5.5 Terminal Block Connection

This section only describes the connection method, please refer to 2.7 for specific parameter settings of the unit.



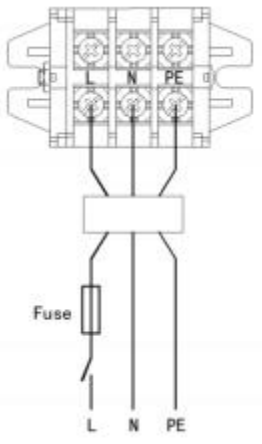
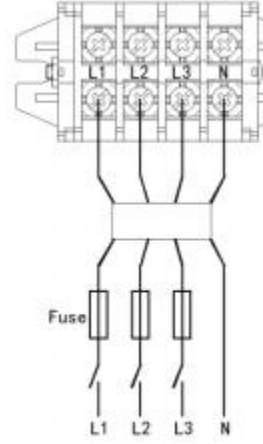


No.	Description	Print	Connect to
A	Solar Water Heater	H	P_e# AHS Water Pump
B	Wire Controller	I	P_h# Mixing Water
C	Room Thermostat	J	SV1# 3-Way Valve
D	Auxiliary Heat Source	K	SV2# 3-Way Valve
E	P_a# Built-in Water Pump	L	SV3# Mixing Valve
F	P_b# Heating/Cooling Water Pump	M	EH1# Electric Heater (DHW)
G	P_c# Auxiliary Water Pump	N	EH2# Electric Heater (Buffer Tank)

The unit voltage can be output in two ways.

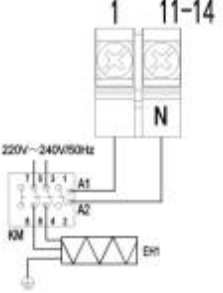
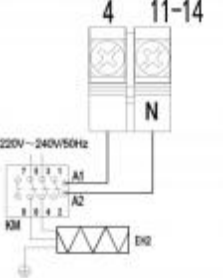
Type	Output
1	AC220V-240V~/50Hz
2	Passive

### 2.5.5.1 Power Supply

Type	Wring Type	Type	Wring Type
Single Phase		Three Phase	

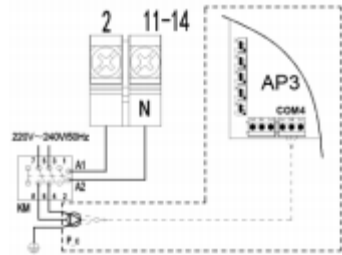
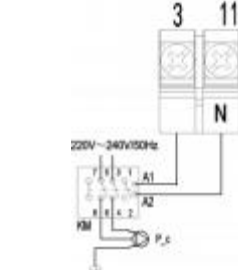
### 2.5.5.2 Electric Heater/AHS

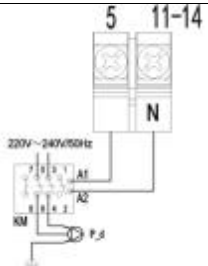
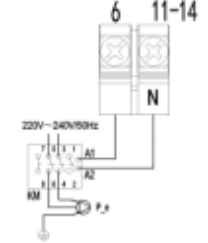
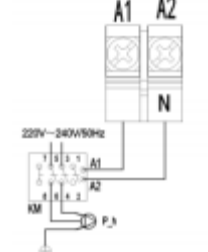
Electric heater requires additional relays, please refer to wiring diagram:

No.	Wring Type	Output Type
EH1/AHS		Type 1
EH2/AHS		
<p>* If AHS is used for buffer tank, connect to EH1; if AHS is used for hot water tank, connect to EH2</p>		

### 2.5.5.3 Water Pump

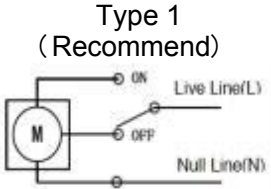
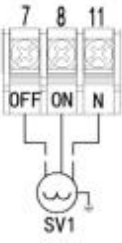
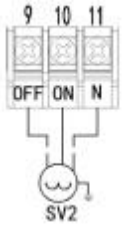
Water pump requires additional relays, please refer to wiring diagram:

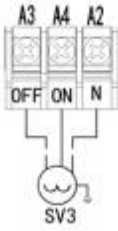
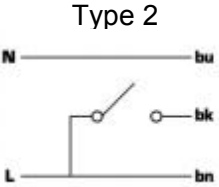
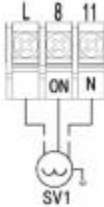
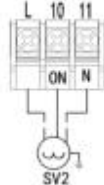
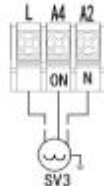
No.	Wring Type	Output Type
<p>P_b1 Heating/Cooling Water Pump</p>		Type 1
<p>P_c Auxiliary Water Pump</p>		

<p>P_d DHW Return Water Pump</p>		
<p>P_e AHS Water Pump</p>		
<p>P_h# Mixing Water Pump</p>		
<p>*1. Water pump can be PWM controlled when connected to the <b>COM4</b> port on the motherboard <b>AP3</b></p>		

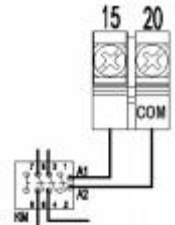
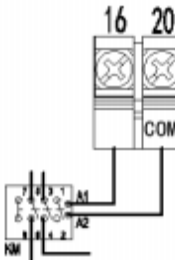
### 2.5.5.4 Three-Way Valve

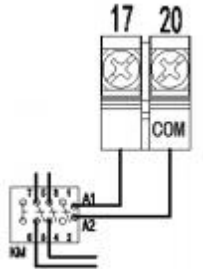
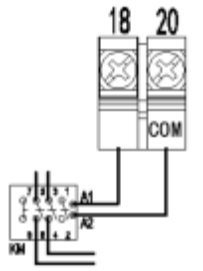
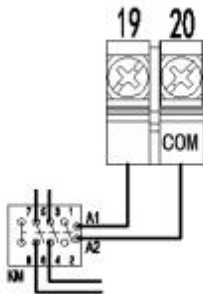
There are two wiring types for 3-way valves, please refer to the wiring diagram :

Control Type	No.	Wring Type	Description	Output Type
	<p>SV1 3-Way Valve</p>		<p>When the unit is running in heating mode, terminal 7# outputs voltage and terminal 8# no output. When the unit is running in hot water mode, terminal 7# no output and terminal 8# outputs voltage.</p>	<p>Type 1</p>
	<p>SV2 3-Way Valve</p>		<p>When the unit is running in heating mode, terminal 9# outputs voltage and terminal 10# no output. When the unit is running in cooling mode, terminal 9# no output and terminal 10# outputs voltage.</p>	

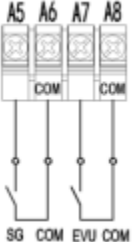
	SV3 Mixing Valve		When the unit is enabled for dual zone temperature control: When A3 is outputting voltage, the mixing valve will close proportionally. When A4 outputs voltage, the mixing valve will open proportionally.
	SV1 3-Way Valve		When the unit is running heating mode, the 3-way valve is not powered. When the unit is running hot water mode, terminal 8# outputs voltage. Three-way valve switching direction
	SV2 3-Way Valve		When the unit is running heating mode, the 3-way valve is not powered. When the unit is running cooling mode, terminal 10# outputs voltage. Three-way valve switching direction
	SV3 Mixing Valve		When the unit is enabled for dual zone temperature control When L is powered on, the mixing valve will close proportionally. When A4 is powered on, the mixing valve will open proportionally

### 2.5.5.5 Linkage Switch

No.	Wring Type	Output Type
Forced Cooling Switch		Type 2
Linkage Switch (External Water Pump)		

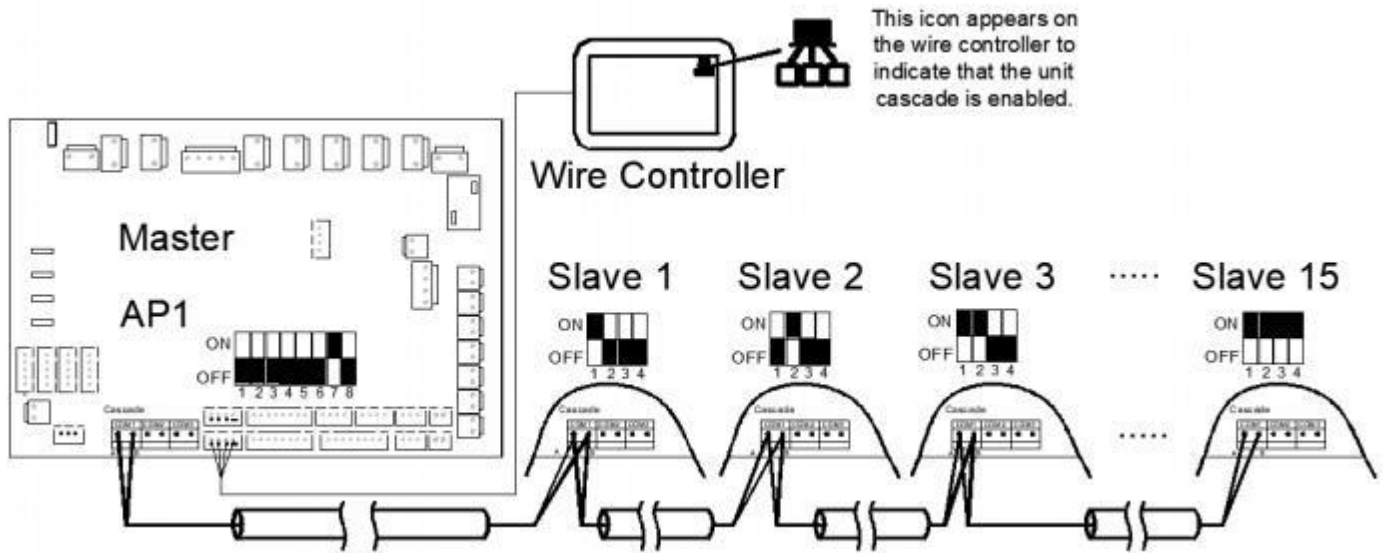
Forced Heating Switch	
Linkage Switch (Heat Source of DHW)	
Linkage Switch (Room Thermostat)	

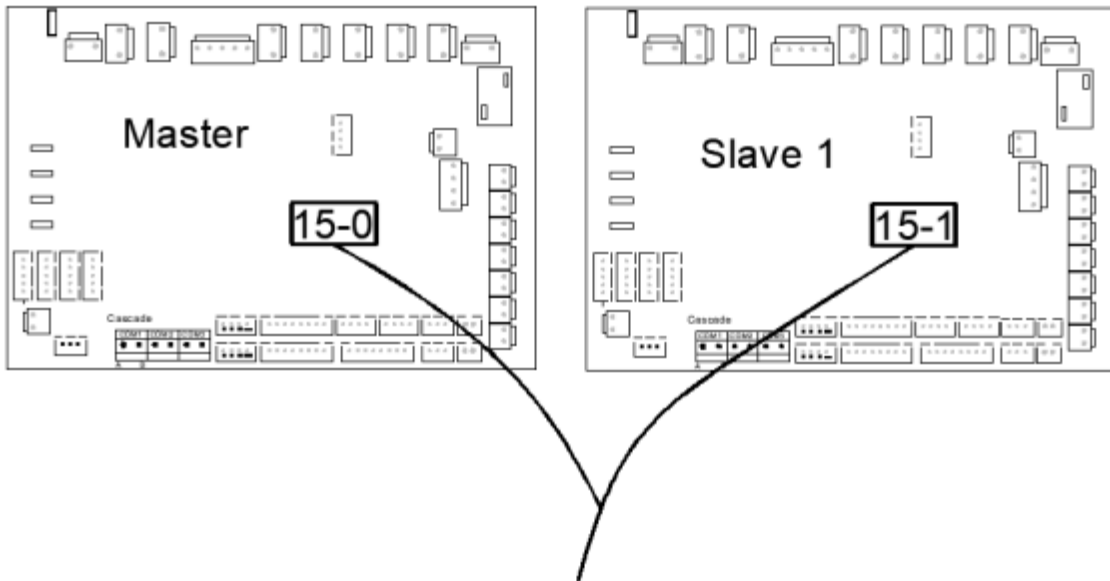
### 2.5.5.6 SG Ready

No.	Wring Type	Output Type
SG Ready		Type 2

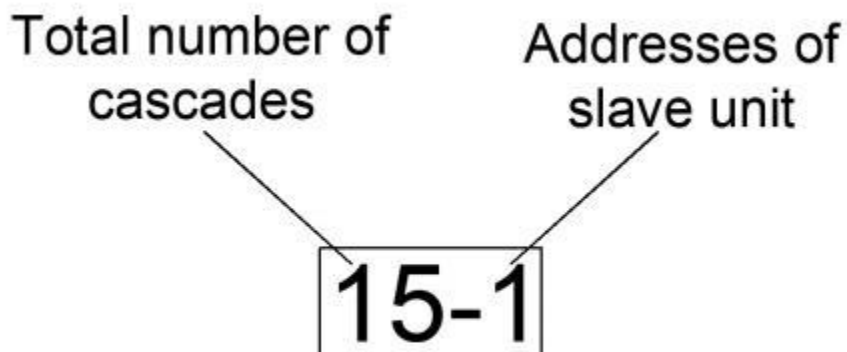
### 2.5.5.7 Cascade

The wiring of the unit refers to the following way, the dip switch setting refers to 1.5, and the parameter setting refers to 2.7.7.





After the units are cascaded, the digital tube on the main board will display the number of cascades and the addresses of the slaves, and you can query the operation of the units with the corresponding addresses on the wire controller.



Note:

- With the cascade on, the slave unit is controlled only by the master wire controller.
- Cascade maximum of 1 master unit and 15 slave units.
- Communication cables must be shielded and grounded.

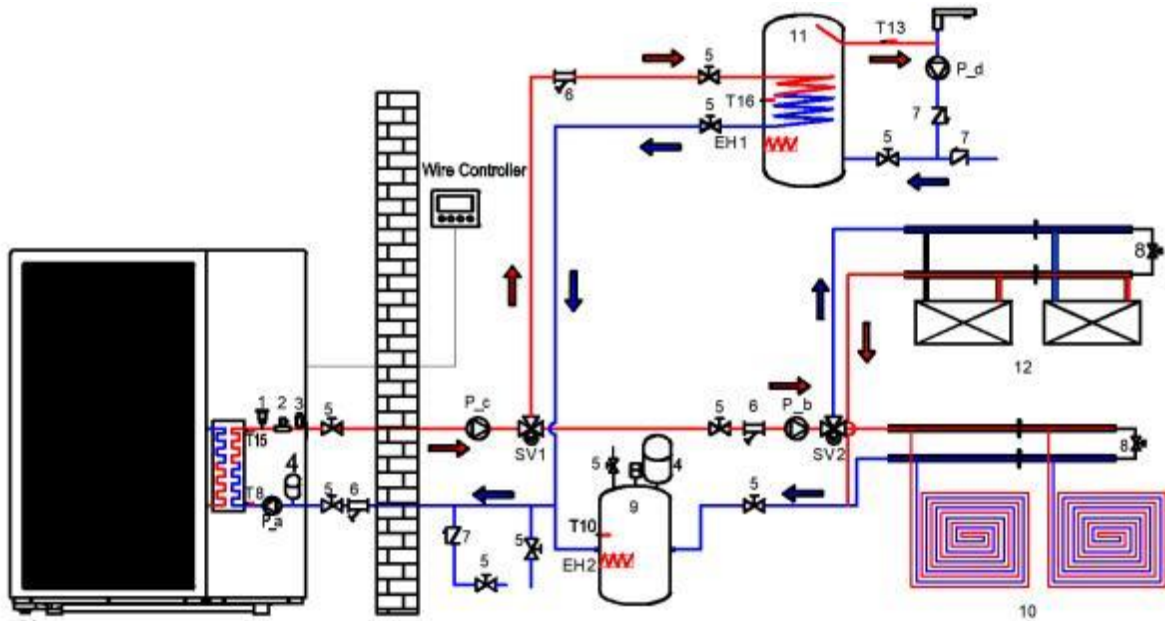
## 2.6 Applications and Settings

This chapter focuses on common installation applications.

### 2.6.1 Heat Pump System Solutions

#### 2.6.1.1 Single Circulation System

Single circulation system: there is only one circulating water circuit between the unit and the use side. Suitable for houses with relatively small areas.



#### Parameter Settings:

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 if you need to set it.

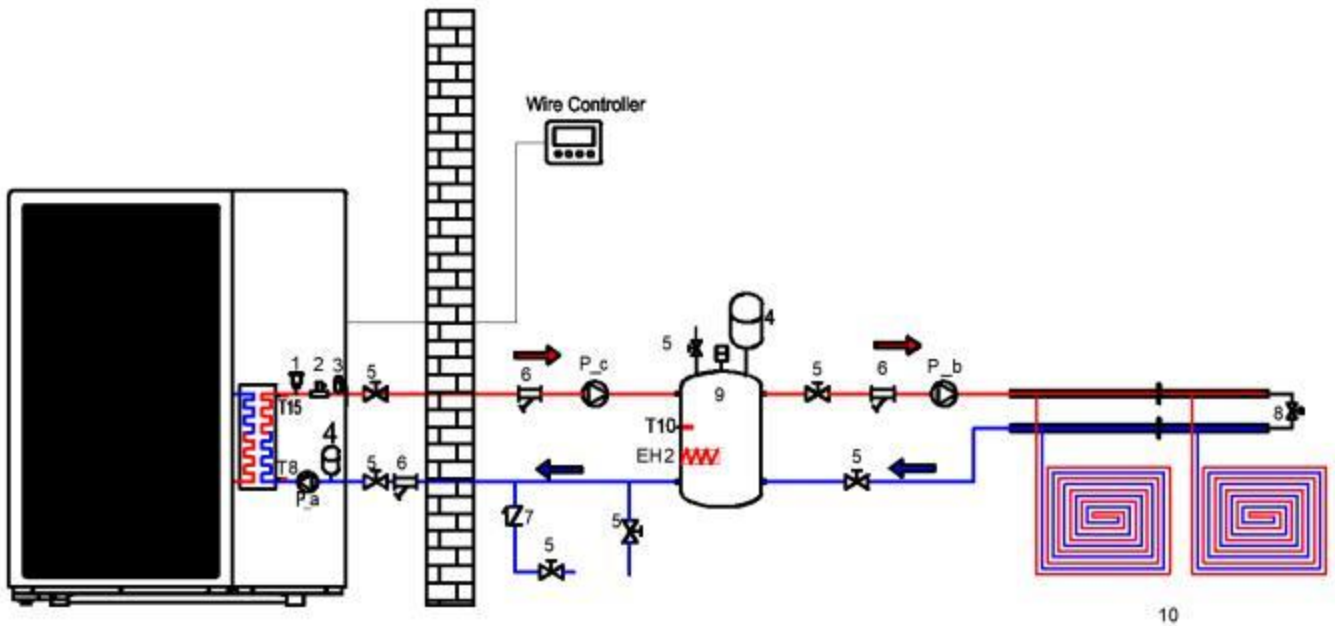
Refer to section 2.5 and 2.7 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	SV2	3-Way Valve (Field Supply)
7	Non-Return Valves (Field Supply)	EH1	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	EH2	Electric Heater (Field Supply)
9	Buffer Tank (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)



1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
  2. If you need to turn on the return function, you need to install this pump.
  3. This sensor needs to be enabled when opening the dual-temperature zone control.
  4. If you need to enable the return water function, you need to enable this sensor.
- NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.2 Underfloor Heating



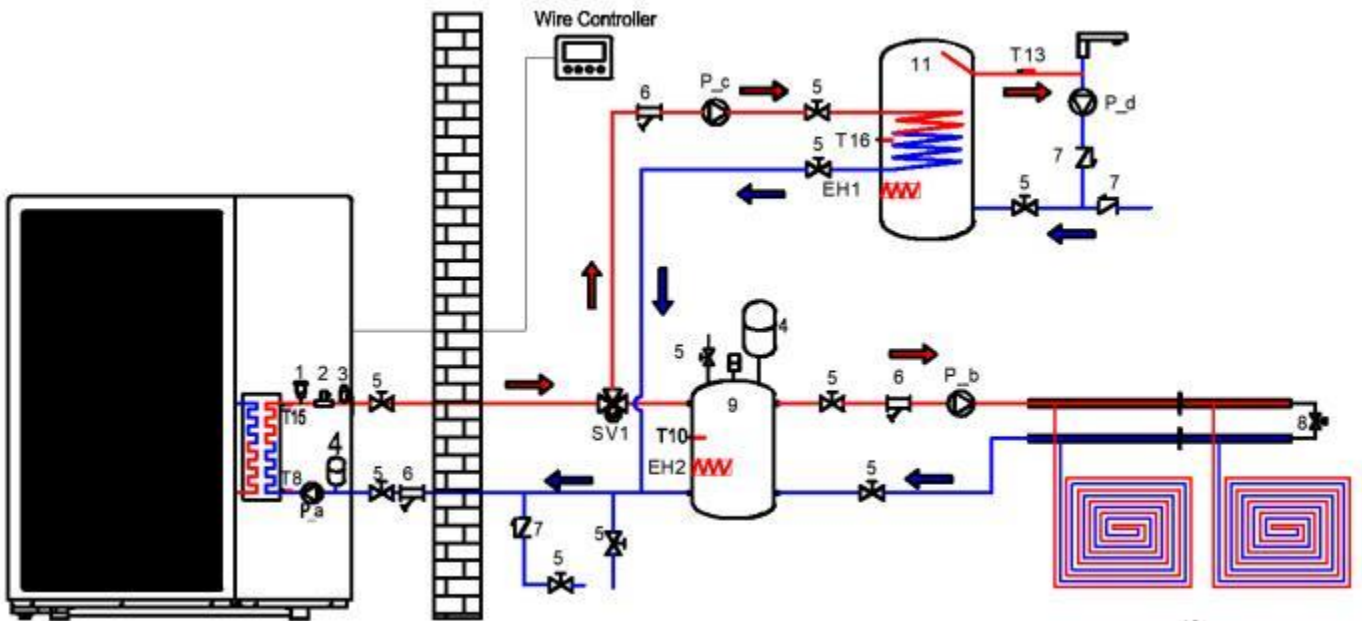
Parameter setting:  
 P48=0 disable tank temperature sensor (default)  
 L12=1 disable high temperature sterilization (default)  
 Refer to Section 2.5 and Section 2.7 for wiring and parameter settings.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	EH2	Electric Heater (Field Supply)
5	Ball Valves (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
6	Filter (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T10 <sup>2</sup>	Buffer Tank Temp. Sensor (Built-in)
8	Bypass Valves (Field Supply)		
9	Buffer Tank (Field Supply)		
10	Underfloor Heating (Field Supply)		

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. This sensor needs to be enabled when opening the dual-temperature zone control.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.3 Underfloor Heating & DHW



#### Parameter Settings:

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

Refer to section 2.5 and 2.7 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	EH1	Electric Heater (Field Supply)
7	Non-Return Valves (Field Supply)	EH2	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.

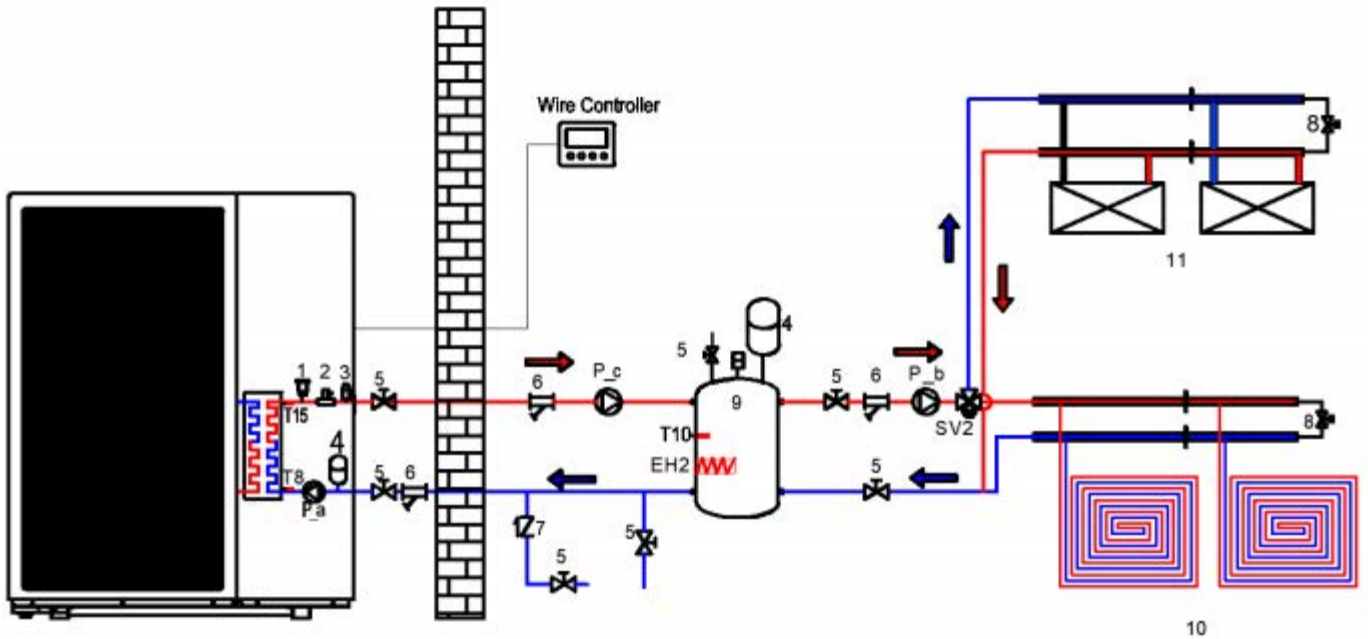
2. If you need to turn on the return function, you need to install this pump.

3. This sensor needs to be enabled when opening the dual-temperature zone control.

4. If you need to enable the return water function, you need to enable this sensor.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.4 Underfloor Heating & Fan Coil (Cooling)



Parameter setting:  
 P48=0 disable tank temperature sensor (default)  
 L12=1 disable high temperature sterilization (default)  
 Refer to Section 2.5 and Section 2.7 for wiring and parameter settings.

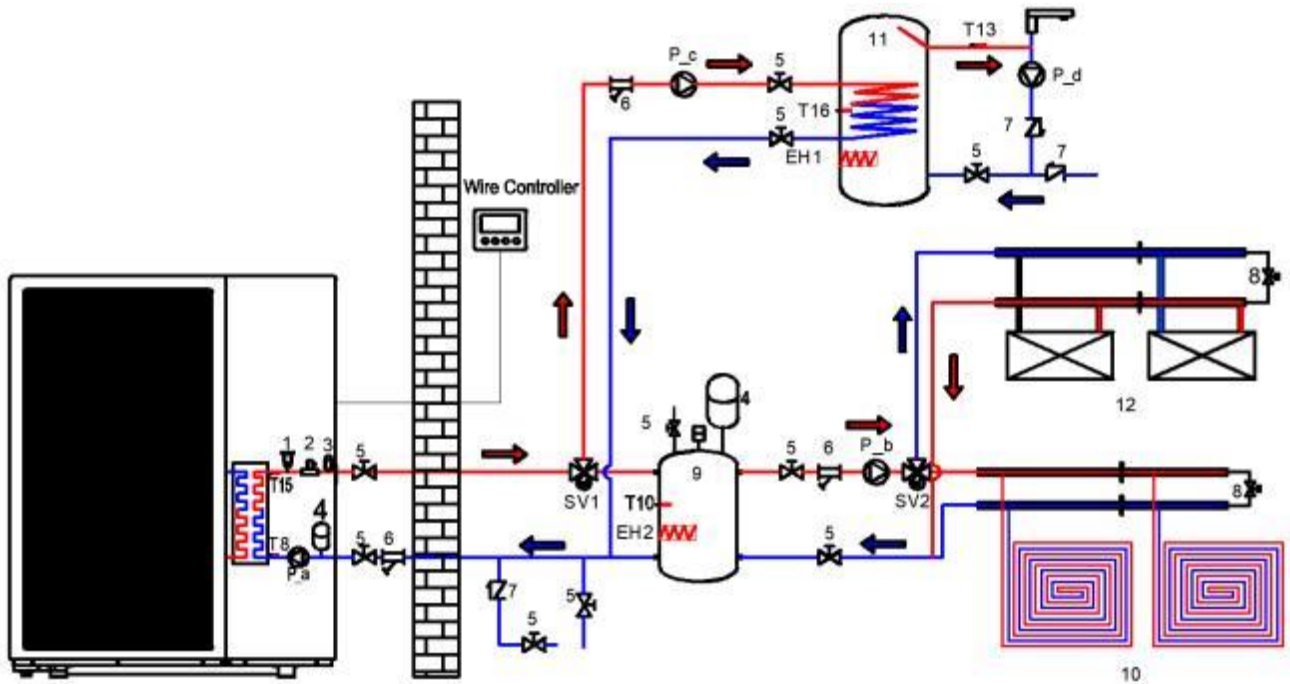
No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	EH2	Electric Heater (Field Supply)
5	Ball Valves (Field Supply)	SV2	3-Way Valve (Field Supply)
6	Filter (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
8	Bypass Valves (Field Supply)	T10 <sup>2</sup>	Buffer Tank Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)		
10	Underfloor Heating (Field Supply)		
11	Fan Coil (Field Supply)		

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.

2.This sensor needs to be enabled when opening the dual-temperature zone control.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.5 Underfloor Heating & Fan Coil (Cooling) & DHW



**Parameter Settings:**

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set.

Refer to section 2.5 for wiring

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	SV2	3-Way Valve (Field Supply)
7	Non-Return Valves (Field Supply)	EH1	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	EH2	Electric Heater (Field Supply)
9	Buffer Tank (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
11	Fan Coil (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
12	DHW Tank (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor(Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.

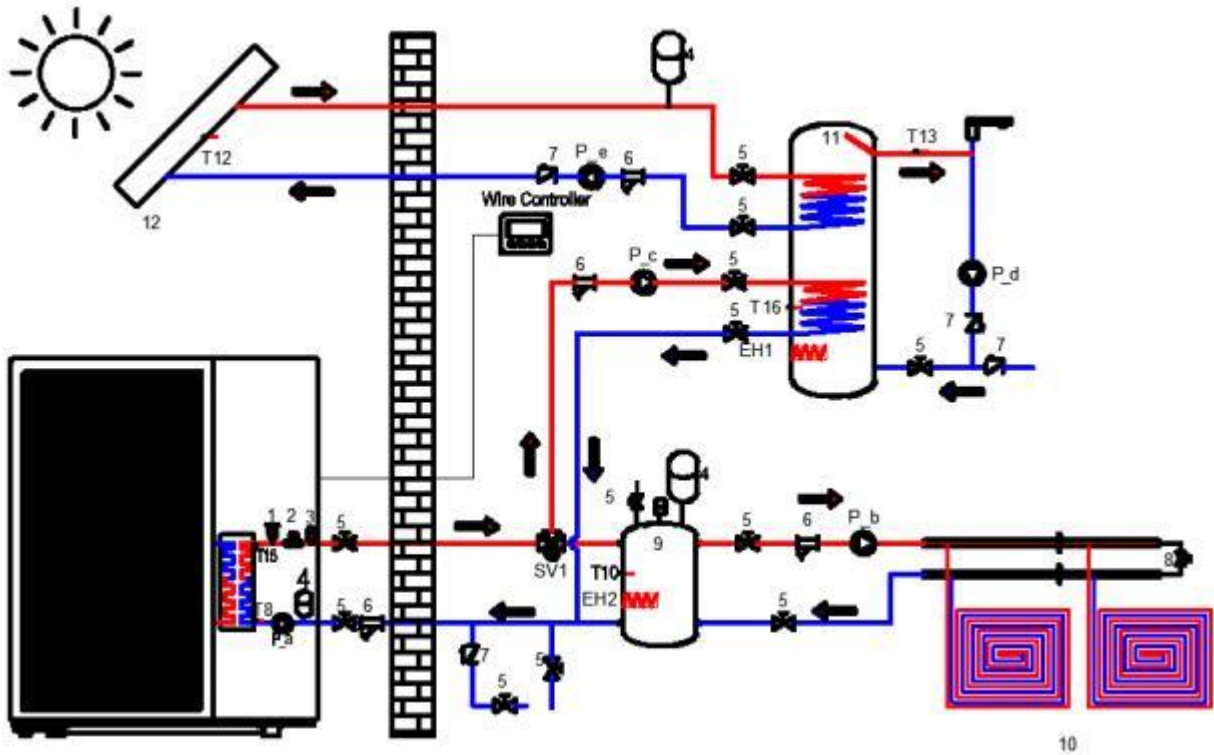
2. If you need to turn on the return function, you need to install this pump.

3. This sensor needs to be enabled when opening the dual-temperature zone control.

4. If you need to enable the return water function, you need to enable this sensor.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.6 Underfloor Heating & DHW & Solar Water Heater



**Parameter Settings:**

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

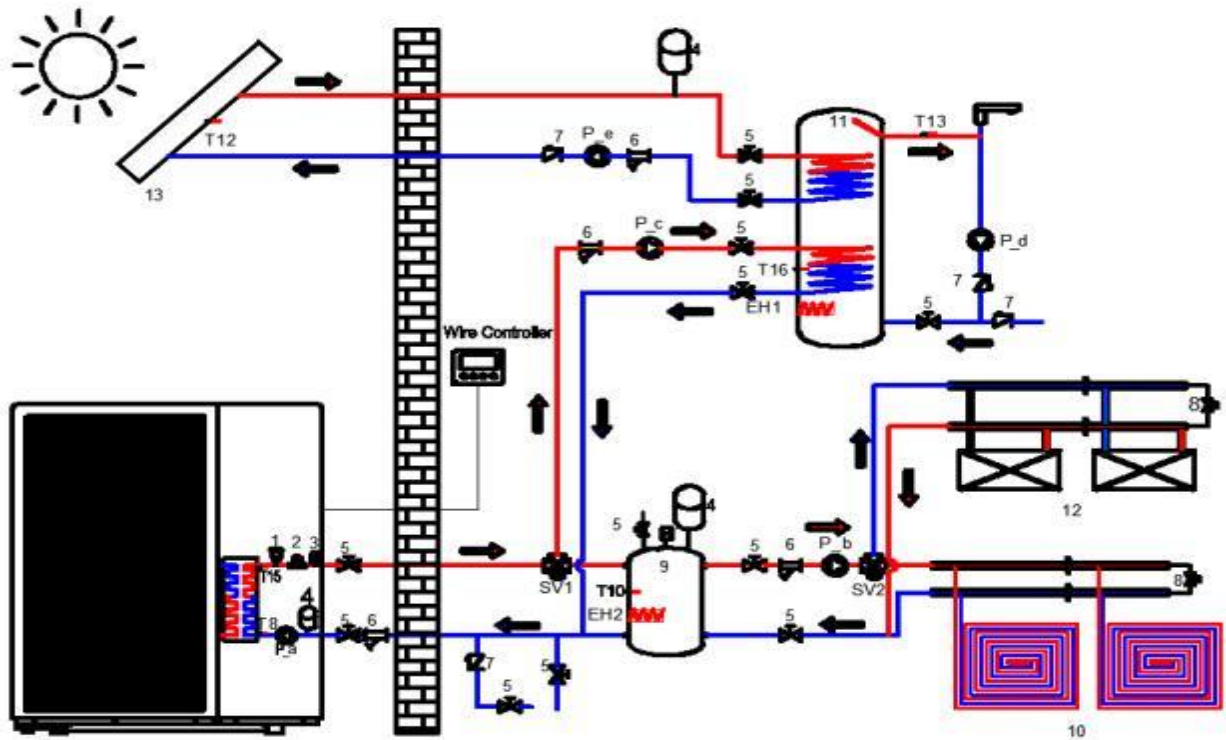
The water pump is controlled by P151 and P152 parameters. Please refer to Chapter 2.7.3.5 for specific settings.

Refer to section 2.5 and 2.7 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	P_e	AHS Water Pump (Field Supply)
6	Filter (Field Supply)	SV1	3-Way Valve (Field Supply)
7	Non-Return Valves (Field Supply)	EH1	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	EH2	Electric Heater (Field Supply)
9	Buffer Tank (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
12	Solar Water Heater (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)
		T12	AHS Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
  2. If you need to turn on the return function, you need to install this pump.
  3. This sensor needs to be enabled when opening the dual-temperature zone control.
  4. If you need to enable the return water function, you need to enable this sensor.
- NOTE: If you need to install a solar water heater, the water tank needs to have 2 sets of coils. The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.1.7 Underfloor Heating & Fan Coil (Cooling) & DHW & Solar Water Heater



**Parameter Settings:**

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

The water pump is controlled by P151 and P152 parameters. Please refer to Chapter 2.7.3.5 for specific settings. Refer to section 2.5 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	P_e	AHS Water Pump (Field Supply)
6	Filter (Field Supply)	SV1	3-Way Valve (Field Supply)
7	Non-Return Valves (Field Supply)	SV2	3-Way Valve (Field Supply)
8	Bypass Valves (Field Supply)	EH1	Electric Heater (Field Supply)
9	Buffer Tank (Field Supply)	EH2	Electric Heater (Field Supply)
10	Underfloor Heating (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
12	Fan Coil (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
13	Solar Water Heater (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)
		T12	AHS Temp. Sensor (Built-in)



Parameter Settings:

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

The water pump is controlled by P151 and P152 parameters. Please refer to Chapter 2.7.3.5 for specific settings. Refer to section 2.5 for wiring and parameter setting.

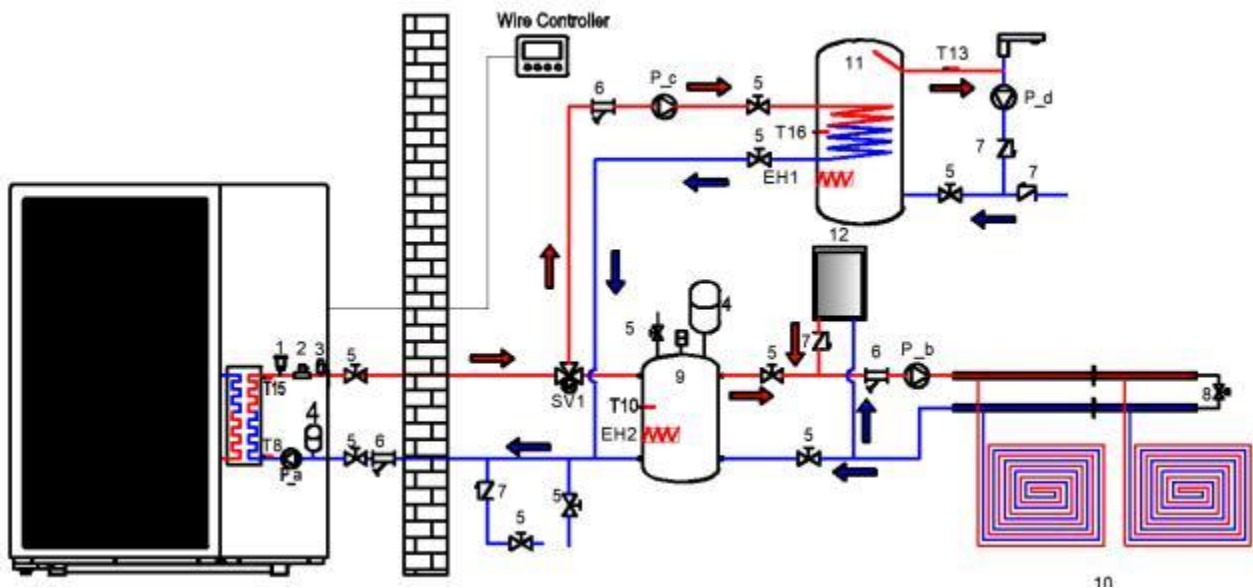
No.	Name	No.	Name
-----	------	-----	------

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. If you need to turn on the return function, you need to install this pump.
3. This sensor needs to be enabled when opening the dual-temperature zone control.
4. If you need to enable the return water function, you need to enable this sensor.

NOTE: If you need to install a solar water heater, the water tank needs to have 2 sets of coils. The installation diagram is for reference only and installation is subject to actual conditions.

## 2.6.2 Heat Pump & AHS System Solutions

### 2.6.2.1 AHS (Heating)



10

#### Parameter Settings:

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

The AHS setting please refer to Chapter 2.7.2.1 for specific settings.

Refer to section 2.5 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	EH1	Electric Heater (Field Supply)
7	Non-Return Valves (Field Supply)	EH2	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
12	AHS (Field Supply)	T16	DHW Tank Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.

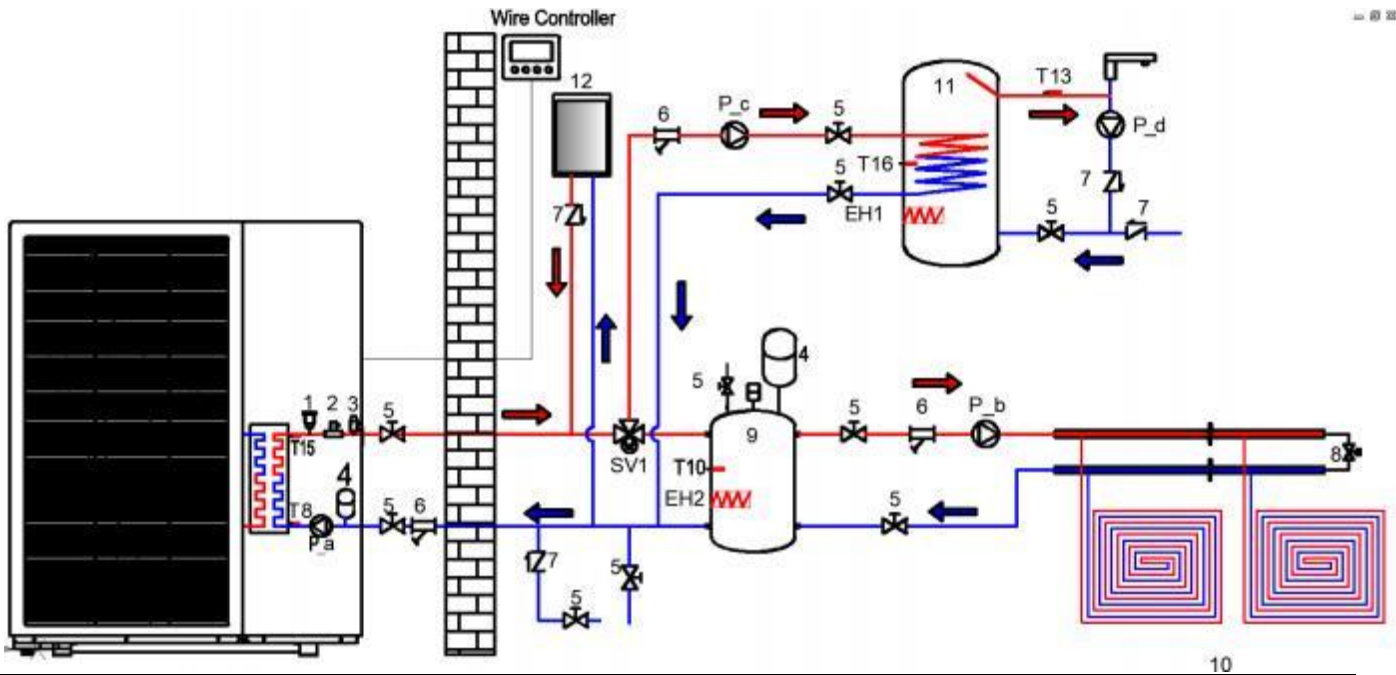
2. If you need to turn on the return function, you need to install this pump.

3. This sensor needs to be enabled when opening the dual-temperature zone control.

4. If you need to enable the return water function, you need to enable this sensor.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.2.2 AHS (Heating & DHW)



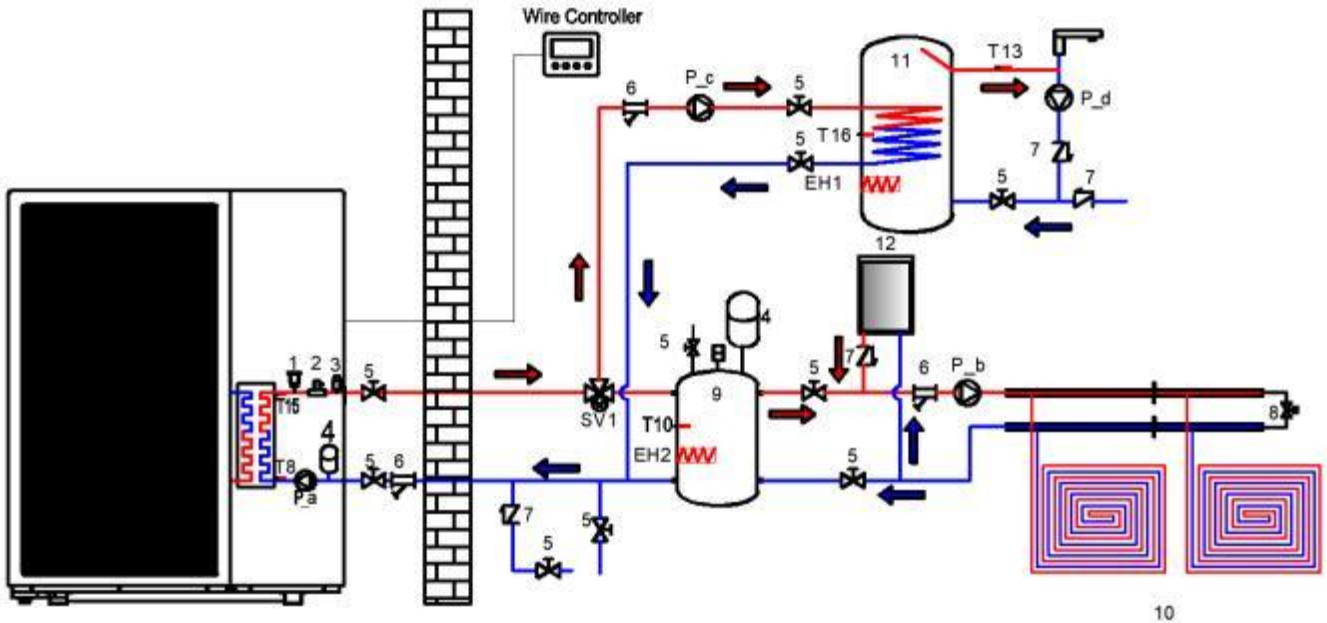
Parameter Settings:  
 P48=1 Enable Tank Temperature Sensor  
 L12=0 Enable sterilization  
 L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.  
 The AHS setting please refer to Chapter 2.7.2.1 for specific settings.  
 Refer to section 2.5 for wiring and parameter setting.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	EH1	Electric Heater (Field Supply)
7	Non-Return Valves (Field Supply)	EH2	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
12	AHS (Field Supply)	T16	DHW Tank Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. If you need to turn on the return function, you need to install this pump.
3. This sensor needs to be enabled when opening the dual-temperature zone control.
4. If you need to enable the return water function, you need to enable this sensor.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

### 2.6.2.3 AHS (DHW)



Parameter Settings:  
 P48=1 Enable Tank Temperature Sensor  
 L12=0 Enable sterilization  
 L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.  
 The AHS setting please refer to Chapter 2.7.2.1 for specific settings.  
 Refer to section 2.5 for wiring and parameter setting.

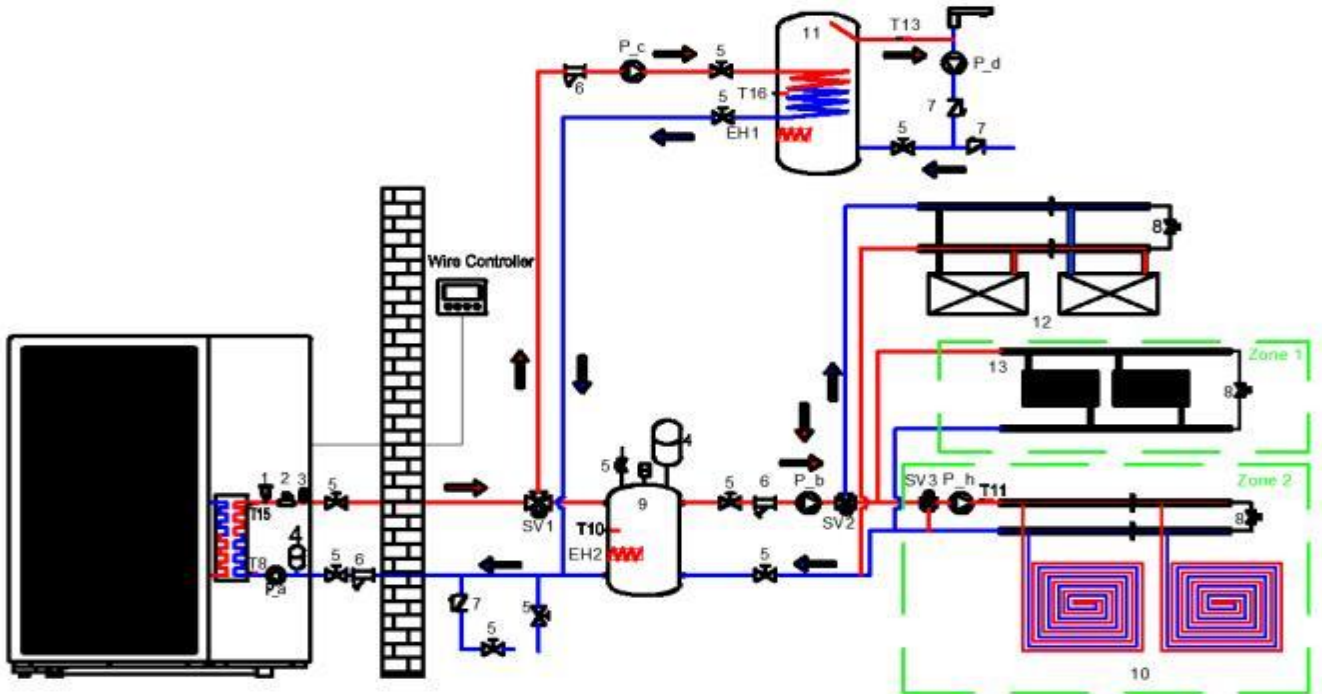
No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	SV1	3-Way Valve (Field Supply)
6	Filter (Field Supply)	EH1	Electric Heater (Field Supply)
7	Non-Return Valves (Field Supply)	EH2	Electric Heater (Field Supply)
8	Bypass Valves (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13 <sup>4</sup>	Return Water Temperature Sensor(Built-in)
12	AHS (Field Supply)	T16	DHW Tank Temp. Sensor (Built-in)

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. If you need to turn on the return function, you need to install this pump.
3. This sensor needs to be enabled when opening the dual-temperature zone control.
4. If you need to enable the return water function, you need to enable this sensor.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

## 2.6.3 Dual Temperature Zone Control Solutions

### 2.6.3.1 Radiator & Underfloor Heating & Fan Coil & DHW



Parameter Settings:

P48=1 Enable Tank Temperature Sensor

L12=0 Enable sterilization

L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.

The AHS setting please refer to section 2.7.2.1 for specific settings.

Please refer to section 2.7.5 for dual temperature zone parameter setting.

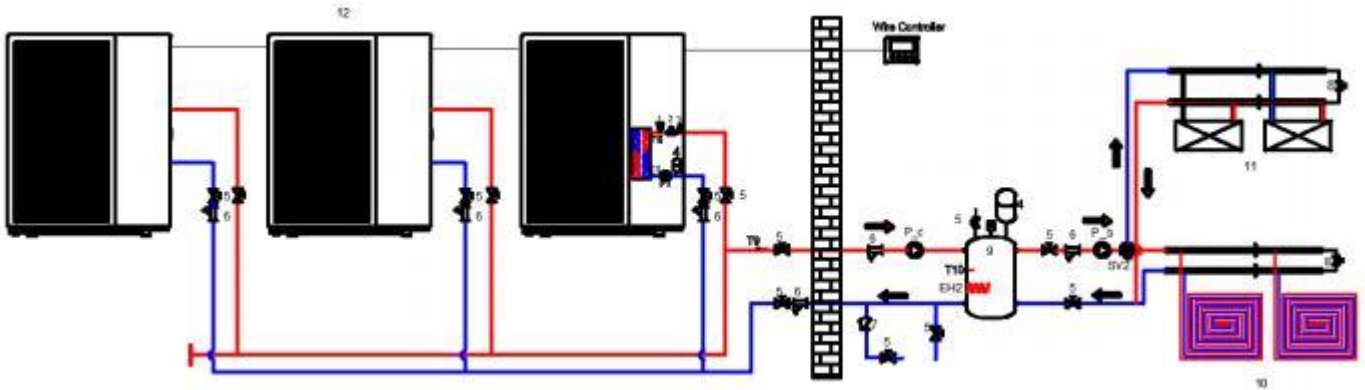
Please refer to section 2.5 for enable the T10 Temp. sensor.

Refer to section 2.5 for wiring.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d <sup>2</sup>	Return Water Pump (Field Supply)
5	Ball Valves (Field Supply)	P_h	Mixing Water Pump (Field Supply)
6	Filter (Field Supply)	SV1	3-Way Valve (Field Supply)
7	Non-Return Valves (Field Supply)	SV2	3-Way Valve (Field Supply)
8	Bypass Valves (Field Supply)	SV3	Mixing Valve (Field Supply)
9	Buffer Tank (Field Supply)	EH1	Electric Heater (Field Supply)
10	Underfloor Heating (Field Supply)	EH2	Electric Heater (Field Supply)
11	DHW Tank (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
13	Radiator (Field Supply)	T10 <sup>3</sup>	Buffer Tank Temp. Sensor (Built-in)
		T13 <sup>4</sup>	Return Water Temperature Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)

	T11 <sup>5</sup>	Zone 2 Temp. Sensor
<p>1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.</p> <p>2. If you need to turn on the return water function, you need to install this pump.</p> <p>3. This sensor needs to be enabled when opening the dual-temperature zone control.</p> <p>4. If you need to enable the return water function, you need to enable this sensor.</p> <p>5. This sensor needs to be enabled when dual temperature zone control is turned on to control the temperature of Zone 2.</p> <p>NOTE: The installation diagram is for reference only and installation is subject to actual conditions.</p>		

## 2.6.4 Cascade Solutions



Parameter setting:

P48=0 disable tank temperature sensor (default)

L12=1 disable high temperature sterilization (default)

P164 is used to control cascade. Please refer to Chapter 2.7.7 for specific setting methods.

Refer to Section 2.5.5.7 for wiring.

Refer to Chapter 1.3.5.1 to set slave unit.

No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c <sup>1</sup>	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	EH2	Electric Heater (Field Supply)
5	Ball Valves (Field Supply)	SV2	3-Way Valve (Field Supply)
6	Filter (Field Supply)	T15	Water Inlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T8	Water Outlet Temp.Sensor (Built-in)
8	Bypass Valves (Field Supply)	T10 <sup>2</sup>	Buffer Tank Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T9	Total Water Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)		
11	Fan Coil (Field Supply)		
12 <sup>3</sup>	Heat Pump Cascade		

1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.

2. This sensor needs to be enabled when opening the dual-temperature zone control.

NOTE: The installation diagram is for reference only and installation is subject to actual conditions.

## 2.7 Unit Operation

This section only introduces the setting parameters and operation introduction of common modes and some parts, for more parameters, please refer to section 4.3.

### 2.7.1 Running Mode

It mainly introduces the operation mode and setting parameters of several operation modes of the unit.

#### 2.7.1.1 Silent Mode

When running this mode, the unit will reduce the compressor frequency and fan frequency to make the unit less noisy. The maximum compressor frequency and fan frequency will be limited to P88 and P89.

Parameter	Default Value/Range/Unit	Description
P88	50 (20-70) /Hz	Max. compressor operating frequency
P89	40 (20-60) /Hz	Max. fan operating frequency

**NOTE:** Lower frequency leads to lower unit capacity  
**Example:** Turn on the silent mode, the maximum operating frequency of the compressor will be limited to 50Hz, and the maximum operating frequency of the fan will be limited to 40Hz.

#### 2.7.1.2 Powerful Mode

To run this mode, the unit will operate by increasing the compressor ramp-up speed and maximum operating frequency, which is then controlled by P179 and P180.

Parameter	Default Value/Range/Unit	Description
P179	15 (0-40) /Hz	Power mode frequency increase
P180	5 (0-40) /Hz	Power mode frequency limit increase

**Example:** Turning on the Power Mode increases the compressor frequency by 15 Hz each time, and the maximum frequency will be increased by 5 Hz from the original maximum compressor operating frequency.

#### 2.7.1.3 Sterilization Mode

When the unit is enabled for hot water mode, you can choose to enable the sterilization mode, and the sterilization mode parameters are set according to the following parameters.



Parameter		Default Value/Range/Unit	Description	Note
L12=2	/	/	Manually enter sterilization mode	Refer to sections 3.1.3.1 and 3.2.3.1 for entry method.
L12=1	/	/	Disable sterilization mode	
L12=0	L13	7 (5-30) /Day	Days between sterilizations	Sterilization cycle
	L14	23:00 (0-24)	Sterilization start-up time	Sterilization mode start time point
	L15	10 (0-50) /Min	Sterilization running time	Sterilization mode continuous running time
	L16	70 (50-80) /C	Sterilization temp setting	Sterilization mode water temperature

**NOTE:** When the unit is enabled for electric heater, the sterilizing mode will be turned on demand.  
**Example:** When the sterilization mode is enabled, the unit will run sterilization once at 23:00 and 7 days interval, the sterilization will continue to run at 70°C water temperature for 10Min and then exit; the next time it will be turned on will be at 23:00 after 7 days.

### 2.7.1.4 Quick Heating Mode

The unit will turn on the electric heater and auxiliary heat source to achieve rapid heating, please refer to 2.7.2 for specific operation.

### 2.7.2 Electric Heater/AHS

Explanation of the operation and parameters of electric heaters for different locations.

#### 2.7.2.1 Electric Heater of Buffer Tank (EH2) / Electric Heater of DHW Tank (EH1) /AHS

If the tank is installed with electric heater and parameters P139/P140 are used for electric heater or auxiliary heat source turn on, then the parameters need to be configured as follows, for wiring please refer to section 2.5.1.

Parameter	Setting Value	Description
P139	0	Enable buffer tank electric heater
	1	Disable buffer tank electric heater
	2	Enable auxiliary heat source for heating
P140	0	Enable DHW tank electric heater
	1	Disable DHW tank electric heater
	2	Enable auxiliary heat source for DHW

### 2.7.2.2 Electric Heater of Water Pipes

If electrical pipe heater is added to the installation, then the P182 parameter needs to be set as shown in the table.

Parameter	Setting Value	Description
P182	0	Enable pipe electric heater(3kW+6kW)
	1	Disable pipe electric heater(3kW)
	2	Disable pipe electric heater(6kW)
	3	Disable pipe electric heater
	4	Forced enable pipe electric heater

### 2.7.3 Water Pump

This section explains how each water pump in the system operates.

#### 2.7.3.1 Built-in Water Pump (P\_a)

The operation of the unit's built-in circulating water pump is controlled by parameter P28, the settings of which are shown in the table below:

Parameter	Setting Value	Description	Note
P28	0 (Default)	Water pump run continuously after the unit reaches the target temperature	
	1	After the unit reaches the target temperature, water pump runs at a cycle of 2Min every 10Min.	
	2	In cooling mode, the water pump runs continuously after the unit reaches the target temperature.	For cooling mode only, other modes operate as P28=1.
	3	In cooling and heating mode, the water pump runs continuously after the unit reaches the target temperature.	For cooling/heating mode only, other modes are operated according to P28=1.
	4	In heating mode, the pump runs continuously after the floor heating reaches the target water temperature	For underfloor heating water temperature only, other modes operate as P28=1

#### 2.7.3.2 Heating/Cooling Water Pump (P\_b)

The water pump is used as a circulating water pump in the heating circuit and the mode of operation is controlled by parameter P150, the settings of which are shown in the table below:

Parameter	Setting Value	Description	Note
P150	1	The water pump starts when the unit is turned on or when it reaches temperature and stops.	
	2	The water pump is controlled via room thermostat	
	3	The water pump is controlled via the wire controller	Wire controller with built-in temperature sensor for use as a room thermostat

### 2.7.3.3 Auxiliary Water Pump (P\_c)

Since the head of the built-in circulating water pump is fixed, if you need to add additional pumps to meet the system demand in the actual installation, you can set different parameters for the installation position of the auxiliary pump, please refer to section 2.5.1 for the wiring .

Parameter	Setting Value	Description
P161	0	Auxiliary pumps for DHW
	1	Auxiliary pumps for cooling/heating circuits
	2	Auxiliary pumps for underfloor heating
	3	Auxiliary pumps for cooling/heating and underfloor heating circuits
	4	Auxiliary pumps for unit circulation
<b>NOTE:</b> When running the corresponding mode, when the main unit circulation pump starts, the unit auxiliary pump starts at the same time.		

### 2.7.3.4 DHW Return Water Pump (P\_d)

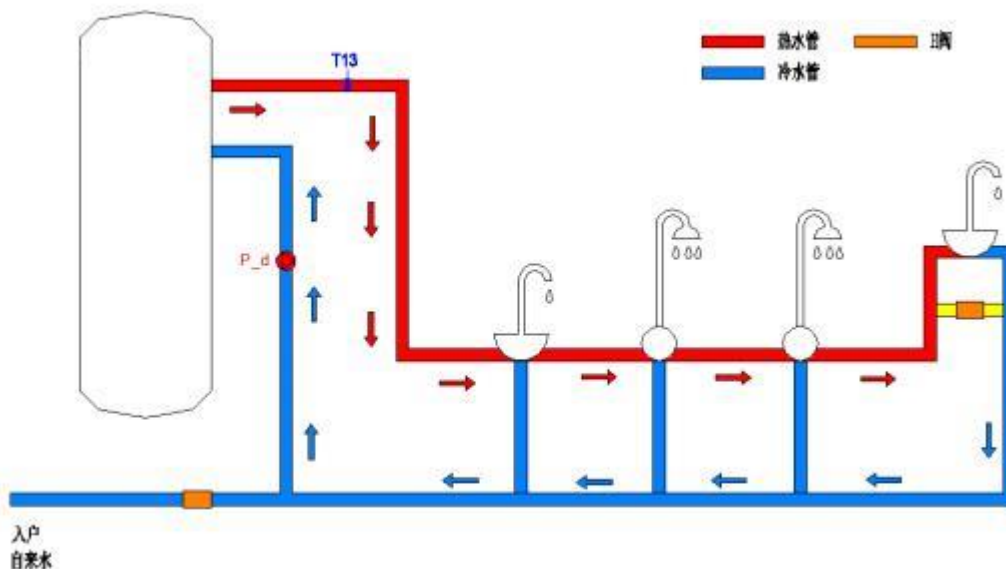
The water pump is used for domestic water tank and user use side, can make the domestic hot water temperature in the house to maintain the temperature of the temperature, the control parameters are controlled by L22, the parameters of the temperature of the circulating return water are controlled by L23 and L24, and the cycle and time of the return water are controlled by L25 and L26, the specific setup and mode of operation are shown in the following table:

Parameter	Setting Value	Description	Note
L22	0 (Default)	Disable DHW return water function	
	1	Enable the water return function and keep the water pump on	
	2	Enable the water return function and control the water return function according to the cycle. At this time, the water pump runs L26 after every L25	L25 : Default 30Min(3-90Min) L26: Default 5Min(1-30Min)
	3	Enable the water return function and control the water return function according to the temperature difference. At this time, if the return water temperature $L23 \leq L23-L24$ , then enable the water return function, and stop after reaching the temperature	L23 : Default 40C(20-65C) L24: Default 5C(1-15C)

**Example:**

When L22=2, the pump will run for 5 Min every 30 Min to maintain the water temperature in the water pipes in the house.

When L22=3 and the set return temperature is 40C, the return function will be enabled when the temperature in the water pipe is lower than  $40-5=35C$ , and will be turned off when the water temperature reaches 40C.



### 2.7.3.5 AHS Water Pump (P\_e)

When the system is connected to solar water heater, the unit starts the solar water heater by controlling this water pump. The water pump is controlled by parameters P151 and P152, which are set in the following table:

Parameter	Default Value/Range/Unit	Description	Note
P151	10 (0-40) <i>IC</i>	DHW tank heat source return temperature	When the solar water heater water pump is used in the hot water tank
P152	10 (0-40) <i>IC</i>	Buffer tank heat source return temperature	When the solar water heater water pump is used in the buffer tank

**NOTE:**  
 Turn on: Hot water/buffer side heat source temperature > hot water/buffer tank temperature + P151/P152  
 Turn off: Hot water/buffer side tank temperature < hot water set temperature

### 2.7.4 Three-Way Valve

This section explains how the three-way valve operates in the system.

#### 2.7.4.1 SV1#Three-Way Valve

This three-way valve is used to switch between DHW-buffer tank. When switching heating/hot water modes, use the three-way valve to switch the water line, see the following table for specific operation:

Running Mode	Terminal Block No.	Status	Control Type
Hot Water	7#	230V	Type 1
	8#	0V	
Heating/Cooling	7#	0V	
	8#	230V	

#### 2.7.4.2 SV2#Three-Way Valve

This three-way valve is used to switch fan coil- floor heating, when switching the end of the work, the three-way valve is used to switch the water circuit, the specific operation is shown in the following table:

Running Mode	Terminal Block No.	Status	Control Type
Fan Coil	9#	230V	Type 1
	10#	0V	
Underfloor Heating	9#	0V	
	10#	230V	

### 2.7.4.3 SV3#Three-Way Valve (Mixing Valve)

When the dual zone temperature control is enabled for underfloor heating mixing, see the table below for specific operation:

Three-Way Valve Status	Terminal Block No.	Status	Control Type
Close	A3#	230V	Type 1
	A4#	0V	
Open	A3#	0V	
	A4#	230V	

### 2.7.5 Linkage Switch

The linkage switch is a dry contact signal, indicating both open and closed states.

Terminal Block No.	Description	Operating Principle	Note
15-20	Forced Cooling Switch	When closed, the unit running cooling mode	Open by default, no parameter setting required
16-20	Linkage Switch (External Water Pump)	Used to connect the indoor water pump to link the unit turn ON/OFF	
17-20	Forced Heating Switch	When closed, the unit running heating mode	
18-20	Linkage Switch (Heat Source of DHW)	Usually used to connect solar water heater	
19-20	Linkage Switch	Connect room thermostat, setup parameters refer to section 2.7.5.1	Controlled by parameter P05

#### 2.7.5.1 Room Thermostat

Connect the room thermostat and use the room temperature to control the unit on and off.

Parameter	Setting Value	Description
P05	0	Enable the linkage switch, when the linkage switch is opened, the unit will turn off; when the linkage switch is closed, the unit will run according to the water temperature control.
	1	Disable the linkage switch, the unit uses the wire controller to control the units turn ON/OFF
	2	Enable the linkage switch, when the linkage switch is opened, the unit will standby, but the three-way valve and pump will be controlled according to the operation mode set by the unit; when the linkage switch is closed, the unit will be controlled according to the water temperature.
	3	When the linkage switch is enabled, the unit can only be used for heating/cooling.

## 2.7.6 Dual Temperature Zone

When the house at the same time using the radiator and floor heating, need to set different water temperature, this time you need to turn on the unit's dual-temperature zone function, the unit through the control of the mixing valve and mixing pump to achieve the floor heating temperature regulation. Currently, the parameter settings refer to the following table:

Parameter	Setting Value	Description	Note
P257	0	Enable dual temperature zones when the unit is turned on	Corresponds to the temperature sensor:
	1	Enable dual temperature zones on demand	T11: Enable temperature zone 2 temperature.
	2 (Default)	Disable dual temperature zones	T10: Enable buffer tank temperature
P258	/	Mixing valve adjustment cycle	Factory parameter adjustment is recommended to consult the manufacturer
P259	/	Mixing valve closure duration	
P265	/	Mixing valve single adjustment percentage	

## 2.7.7 Cascade

If more than one unit needs to be installed at the same time, it is necessary to turn on the cascade function for unit control, refer to section 1.3.5.1 for the dialing method, and refer to section 2.6.4 for wiring and installation. For specific parameter settings, please refer to the following table:

Parameter	Setting Value	Description	Note
P164	0	Enable cascade intelligent control mode	Parameters P165-P170 take effect when enabled
	3 (Default)	Disable cascade intelligent control mode	
P165	3 °C	Loaded unit return temperature	Controls whether to turn on the next unit
P166	2 °C	Derating unit return temperature	Controls whether to turn off the next unit
P167	3 °C	Emergency stops return temperature	Controls whether to turn off the unit
P168	50%	Hot water mode unit activation ratio	Limit the total number of starting units
P169	100%	Heating/Cooling mode unit activation ratio	Limit the total number of starting units
P170	7Min	Load unit cycle	Time to activate the next unit
<b>NOTE:</b> Factory parameter adjustment is recommended to consult the manufacturer			

## 2.7.8 SG Ready

If the unit is connected to the smart grid, this function can be enabled via parameter P255, refer to section 2.5.4 for wiring, and the unit will run in different modes according to the signals received:

Parameter	Status (0:Open 1:Close)		Running Mode	Description
	EVU	SG		
P255=0	1	1	Running DHW Mode	1. Set the hot water temperature to the sterilization temperature. 2. Turn on electric heater
	1	0	Running DHW Mode	1. Set the hot water temperature to the sterilization temperature. 2. Turn on electric heater
	0	1	Running current mode	
	0	0	Turn off hot water mode and enter ECO mode	1. Turn off the hot water mode, turn off the electric heater 2. Turn off after running P256 Min (default 3Min)
P255=1 (Default)	Disable			

### 2.7.9 Anti-Freeze Protection

In cold weather in winter, to protect the unit and water pipes, the unit will automatically enter the anti-freeze protection mode according to the ambient temperature. The operating mode of the unit is as follows:

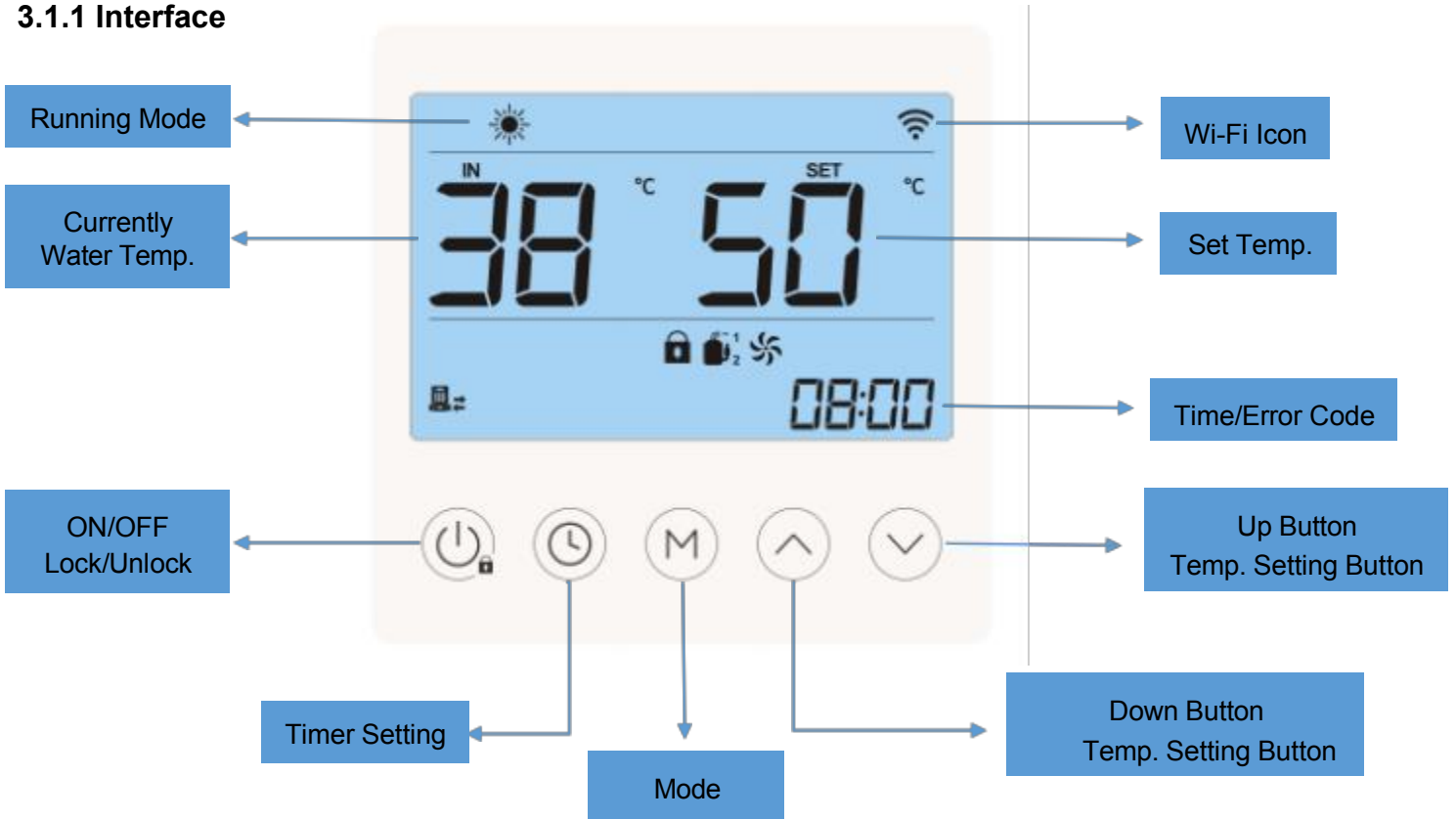
Anti-Freeze Level	Running Mode
I	Running circulating water pump
II	Running circulating water pump and heating mode



### 3 Wire Controller & Parameters Settings

#### 3.1 Wire Controller (LCD)




##### 3.1.1 Interface



##### 3.1.2 Mode Setting





When the wired controller appears , long press " " to unlock , at this time, the wired controller can be operated.

##### 3.1.2.1 Silent Mode





With the wire controller unlocked, press " " and " " at the same time until the " " icon appears on the wire controller and the unit enters the silent mode.

### 3.1.2.2 Sterilization Mode




ON:

With the wire controller in the unlocked state, press and hold " " and " " and " " at the same time for 5S until the wire controller appears the " " icon, the unit enters the sterilization mode.

OFF:


With the wire controller in the unlocked state, press and hold " " and " " and " " simultaneously for 5S until the wire controller " " icon disappears, the unit enters off sterilization mode;

### 3.1.2.3 Quick Heating Mode







When the unit is running and the wire controller is unlocked, press " " and " " at the same time, the " " icon appears on the line controller and it enters the fast heating mode.


### 3.1.3 Parameter Setting

Parameter setting method:

1. When the unit is in the unlocked state of the wire controller, long press " " for 5S to enter the parameter setting interface.

2. After entering the setting interface, long press " " to switch different types of parameters.

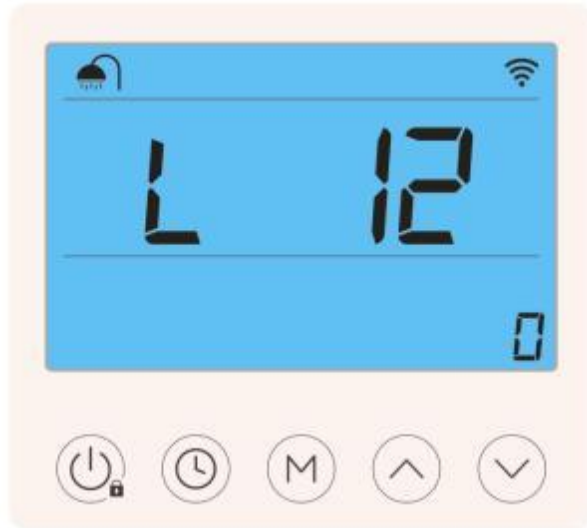
3. In the parameter setting interface, press "" or "" to switch the parameter number, at this time, the parameter icon is flashing, press "" 1S, the parameter value in the lower right corner is flashing, press "" or "" for value modification, press "" 1S, confirm the value.

4. After the modification is completed, no operation within 5S or press "" to save the value and return to the main interface

### 3.1.3.1 Sterilization Setting



Enter the parameter setting interface, switch to L12 parameter "L 12", modify the value to enable the sterilization function, of which L13-L16 are the setting parameters of the sterilization function, refer to section 2.7.1.3 for parameter setting.



### 3.1.3.2 DHW Return Water Setting

Enter the parameter setting interface, switch to the "L" parameter, modify the values of "L22-L26" to set the water return function, and refer to section 2.7.1.3 for parameter setting.

### 3.1.3.3 Daul Temperature Zone Setting

Enter the parameter setting interface, switch to the P257 parameter, and refer to section 2.7.6 for parameter setting.

### 3.1.3.4 SG Ready Setting

Enter the parameter setting interface, switch to the P255 parameter, and refer to section 2.7.8 for parameter setting.

### 3.1.3.5 Cascade Setting

Enter the parameter setting interface, switch to the P164 parameter, and refer to section 2.7.7 for parameter setting.

### 3.1.4 Running Status Query



1. Long press “ ”5S to enter the running parameter query page.



2. Display the parameters and corresponding values, press “ ” or “ ” to query the values of different parameters.

Running status query in cascade mode:



1. Press and hold “ ” for 5 seconds to enter the running status query page, and then enter the host status



parameter interface “ ”



2. Press “ ” or “ ” to query the values of different parameters of the master unit.



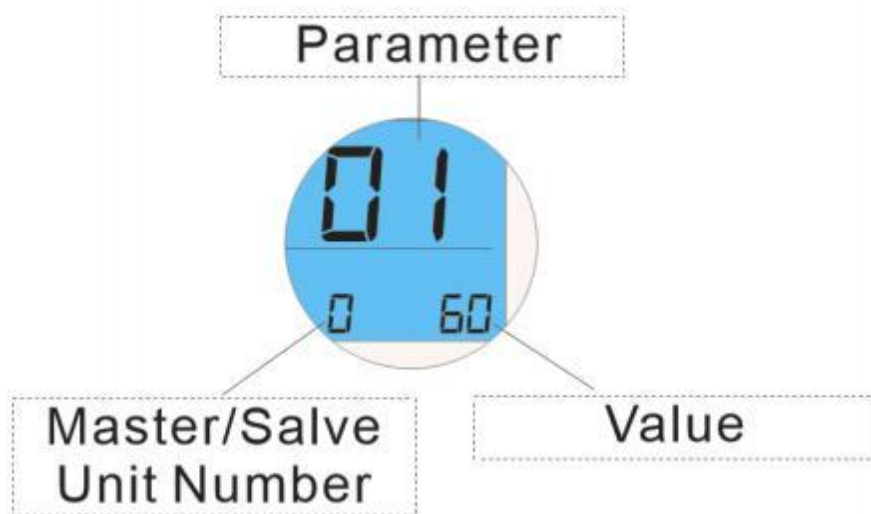
3. Press and hold “ ” for 1S to switch the parameter of different salve unit “ ”




4. Press “ ” or “ ” to check different parameter of the salve unit




5. To back to the master unit status query interface, press “ ” for 1S and return



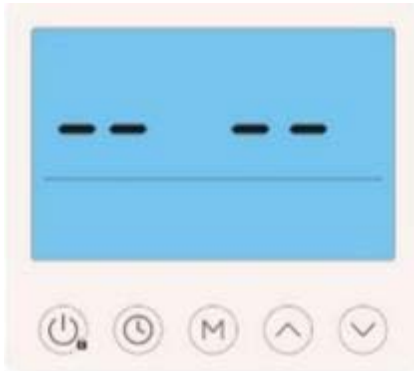
### 3.1.5 Factory Reset

1. In standby mode, press "" for 3S, enters the maintenance mode interface;



2. In the maintenance mode interface, press "" for 5S.

3. The wired controller displays the following page, indicating that the factory settings have been restored successfully. It will return to the main interface after 3 seconds.



### 3.1.6 APP & Unit Binding

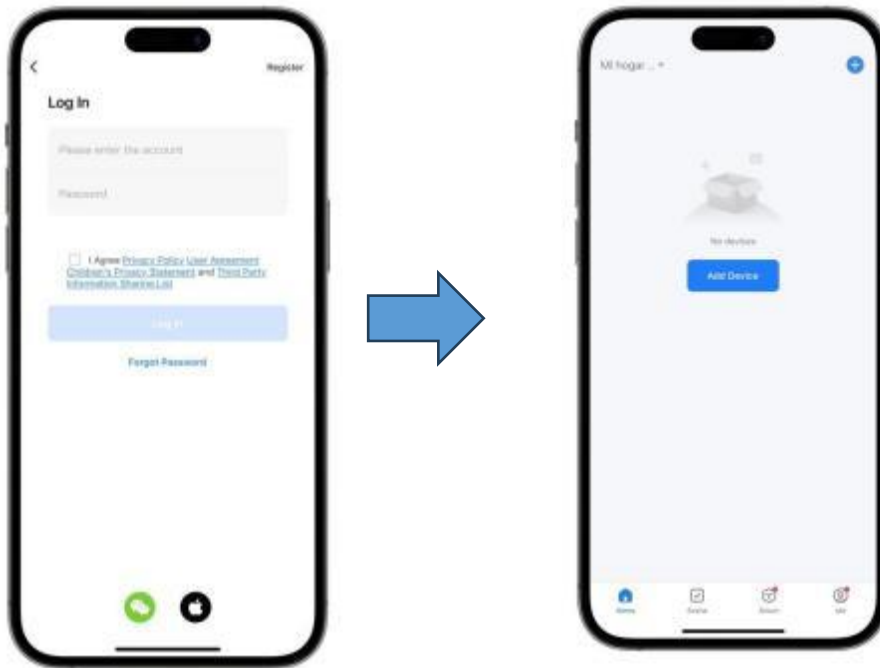
The heat pump supports remote control by mobile phone. You need to download the APP in the app store and register an account to perform network distribution operations. The heat pump supports smart distribution network and AP distribution network. Under normal circumstances, it is recommended to use smart distribution network connection.

For more APP operations, please refer to "Operation Manual."

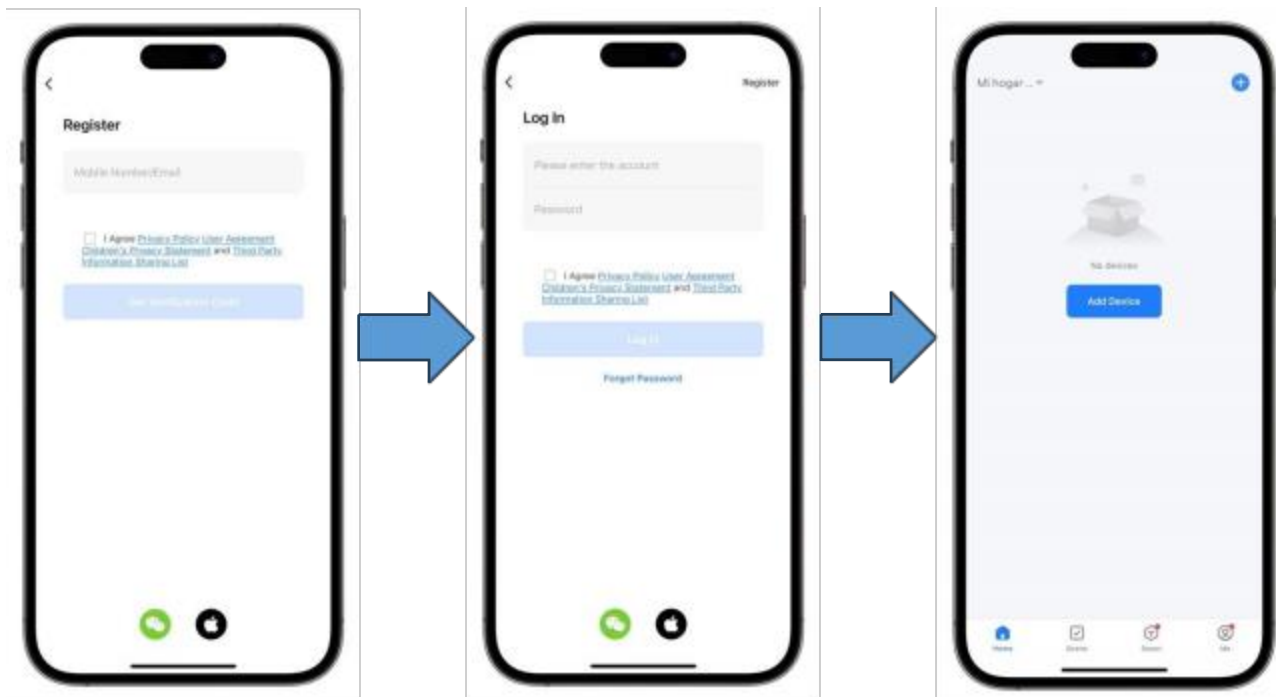
1. Search "Smart Life" in the App Store or scan the following QR code with your mobile phone to download.



2. Enter your account number and password to enter the APP main page.





3. If you log in for the first time, you need to register an account. After registration is completed, enter your account password to enter the APP main page.




### 3.1.6.1 Networking (Smart Mode)

Generally, it is recommended to use smart mode. The wire controller is required to be within WIFI coverage. The wire controller must first enter the network distribution mode.

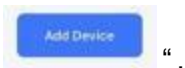
The following is the operation method:

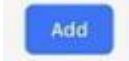
1. In the unlocked state of the wire controller, press " " and " " at the same time;

2. When the WiFi icon " " flashes on the wired controller, release the button to enter the Smart mode.

After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.

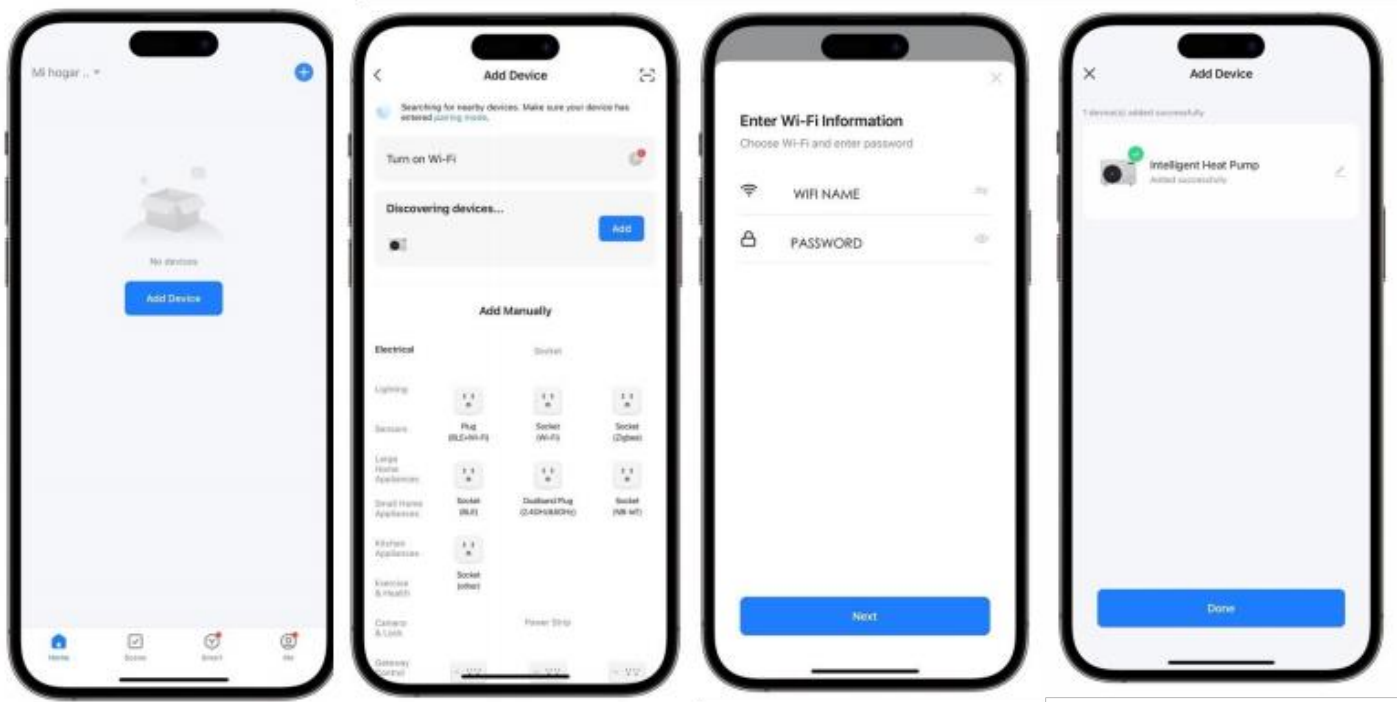
1. Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "



2. In the Smart mode, the APP will automatically identify the device, click " ".

3. After entering the current WIFI account and password, wait for the APP to complete binding.








### 3.1.6.2 Networking (AP Mode)

The wire controller is required to be within WIFI coverage.

The wire controller must first enter the network distribution mode.

The following is the operation method:

1. In the unlocked state of the wire controller, press "" and "" at the same time;

2. When the WiFi icon "" flashes on the wired controller, release the button to enter the AP mode.

3. At this time, the wire controller will transmit a WIFI hotspot named "smartlife-XXXX" or "SL-XXXX".


After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.

1. Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "

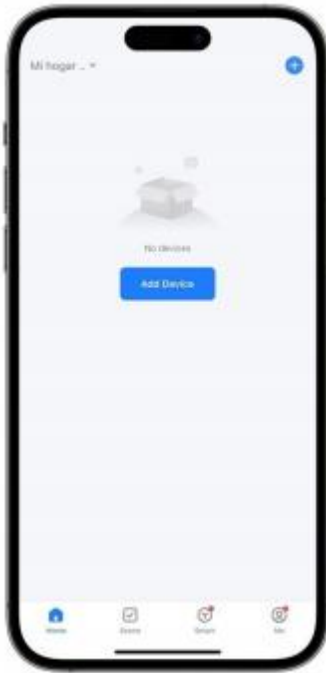


2. In the Smart mode, the APP will automatically identify the device, click ".

3. Enter the account and password of the WIFI to be connected.

4. Click "" to enter the WIFI settings page, find the WIFI hotspot named "smartlife-XXXX" or "SL-XXXX" and connect.

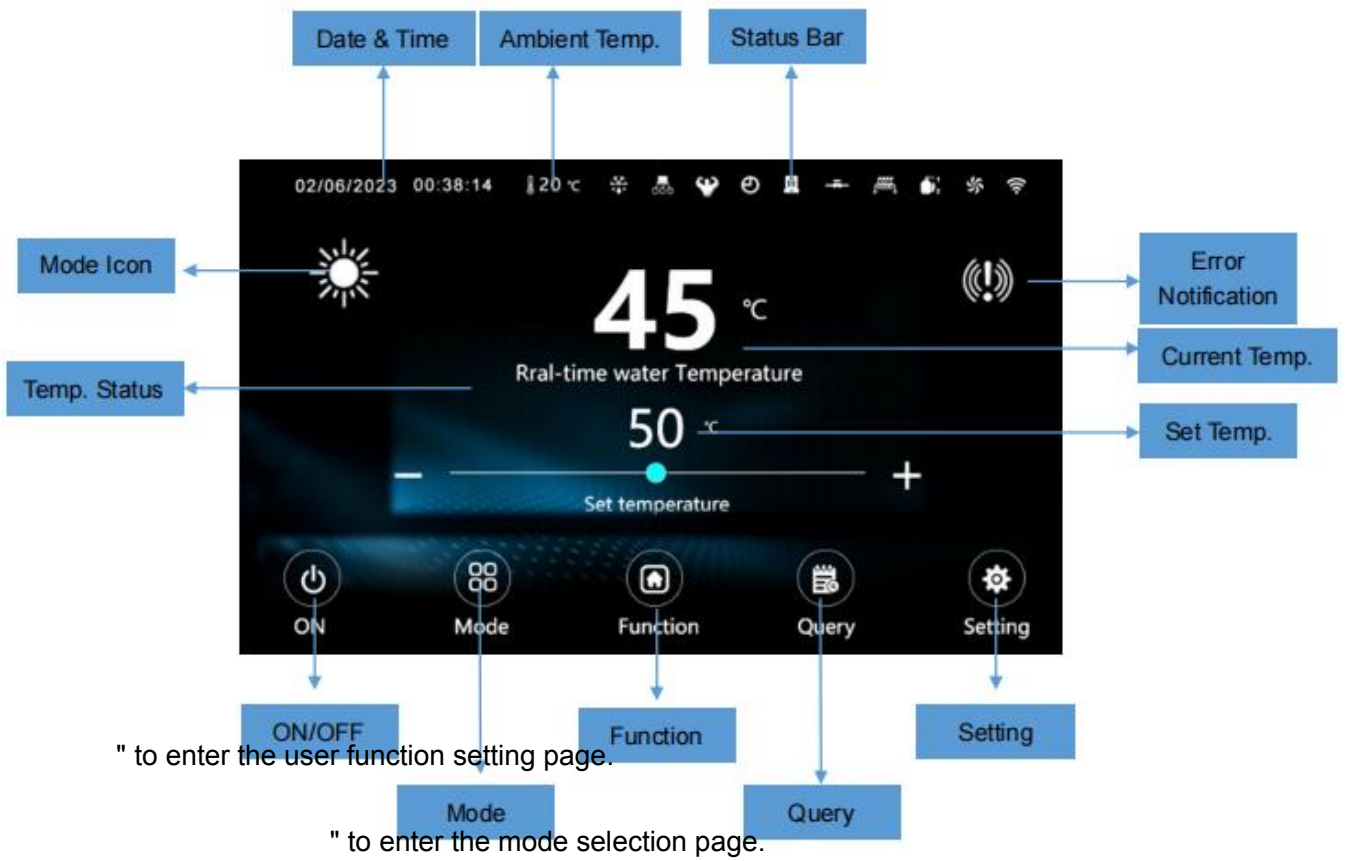
5. Wait for the APP to complete binding



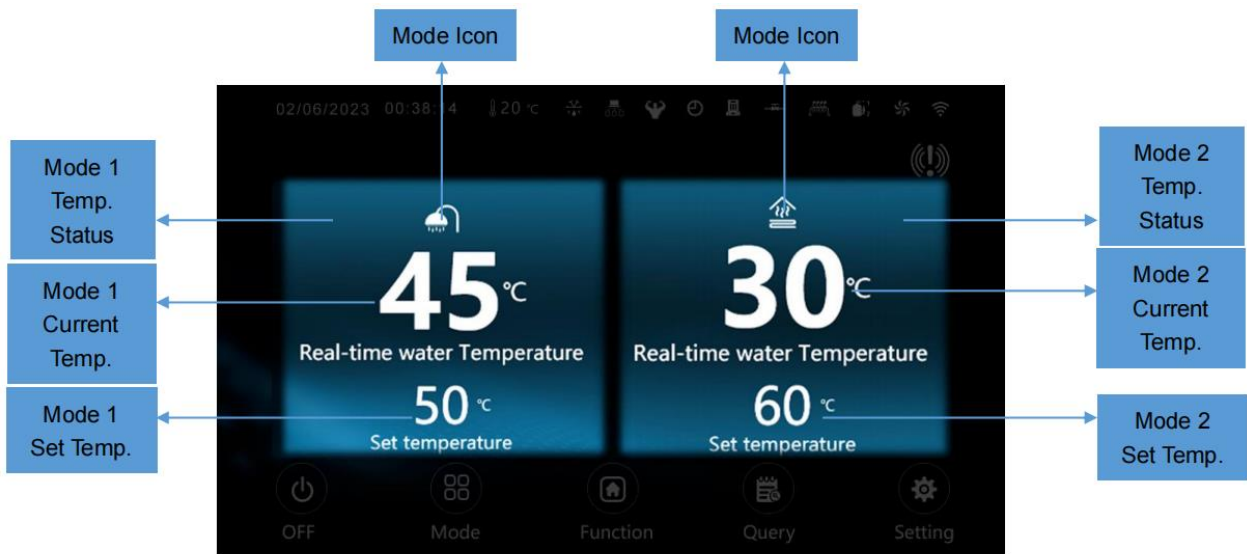
## 3.2 Wire Controller (TFT)

### 3.2.1 Interface

The home page of the wired controller will display different control pages according to different modes. Single mode display page:




Combined mode display page:




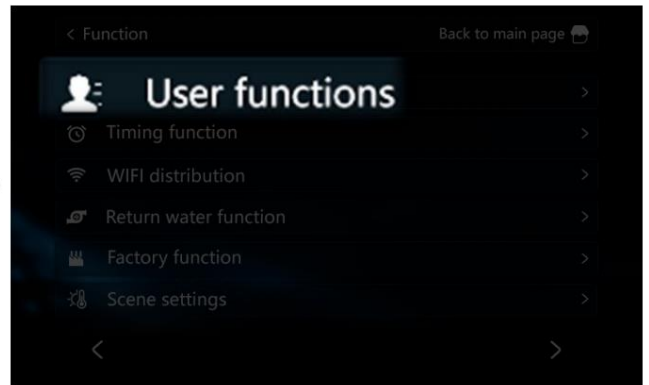
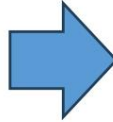
### 3.2.2 Mode Setting

It mainly introduces the operation mode settings introduced in Section 2.7. For more operations or settings, please refer to the "Operation Manual".

Running setting method:

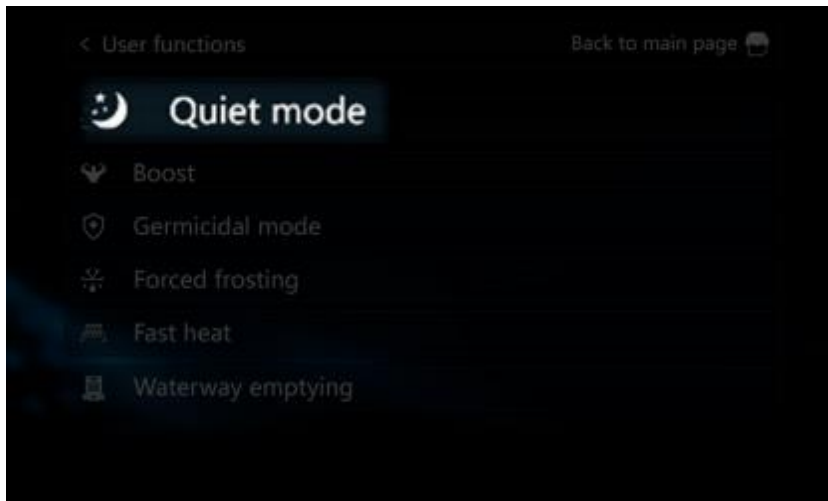
1. Click "" to enter the user function setting page.

2. Click " User functions" to enter the mode selection page.




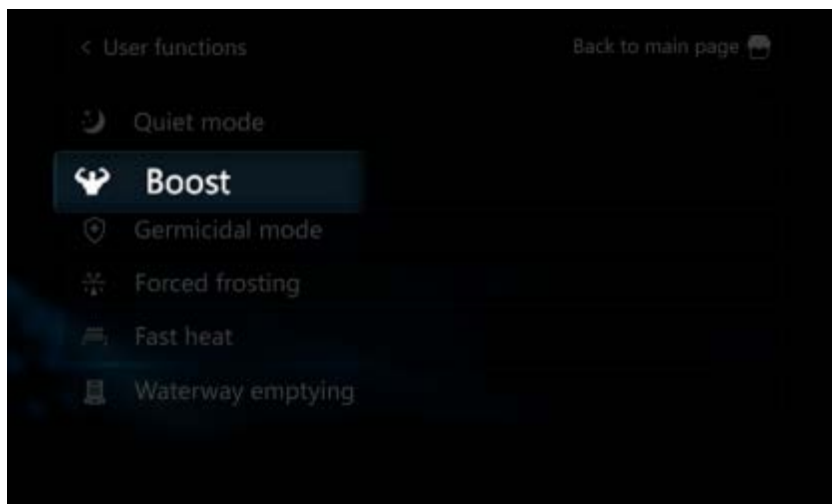
#### 3.2.2.1 Silent Mode

Click " User functions" to enter the unit mode selection.




### 3.2.2.2 Powerful Mode

Click “ User functions” to enter the unit mode selection.




### 3.2.2.3 Sterilization Mode

Click “ User functions” to enter the unit mode selection.



### 3.2.2.4 Quick Heating Mode

Click “ User functions” to enter the unit mode selection.



### 3.2.3 Parameter Setting

This chapter mainly introduces the parameter setting operation method in Chapter 2.7. For specific operating modes and contents, please refer to Chapter 2.7.

User parameters enter method:

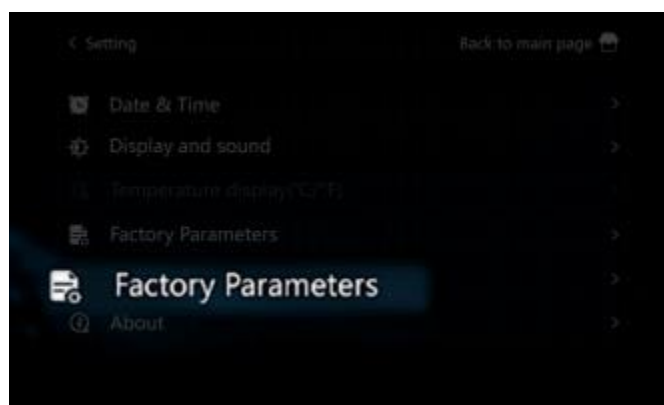


1. Click "Query" to enter the query page.
2. Click "User Parameter" to enter the user parameter setting page.





Factory Parameters enter method:

1. Click  "Setting" to enter the setting page.
2. Click  "Factory Parameters", enter password "2345", to enter the factory parameters setting.



Parameter setting method:

1. Click the value that needs to modify the parameters.
2. Click  "Set value: 50 °C".
3. Enter the value you need to set and click  " " to confirm.



4. Click **OK** " to set the value and the modification is successful.

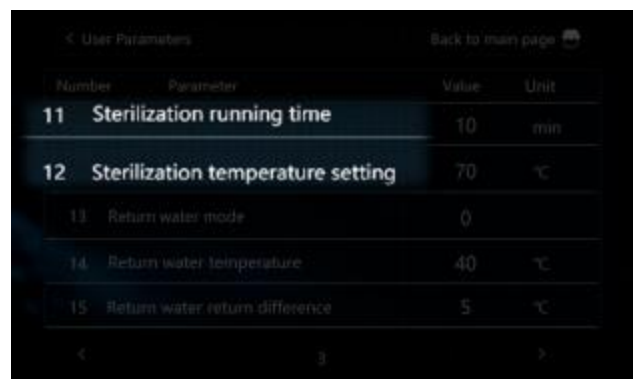


### 3.2.3.1 Sterilization Setting

To improve parameter versatility, different parameters are set for different wire controllers. The parameters corresponding to the sterilization correspond to the following table:

General Parameter	Description	Wire Controller Parameter	Description
L13	Days between sterilizations	9	Days between sterilizations
L14	Sterilization start-up time	10	Sterilization start-up time
L15	Sterilization running time	11	Sterilization running time
L16	Sterilization temp setting	12	Sterilization temp setting

**NOTE:** Just set the parameters 9-12



### 3.2.3.2 DHW Return Water Setting

To improve parameter versatility, different parameters are set for different wire controllers. The parameters corresponding to the DHW return water correspond to the following table:



General Parameter	Description	Wire Controller Parameter	Description
-------------------	-------------	---------------------------	-------------

L22	Water Return Mode	13	Water Return Mode
L23	Return Water Temperature	14	Return Water Temperature
L24	Return Water Return Temperature	15	Return Water Return Temperature
L25	Water Return Cycle	16	Water Return Cycle
L26	Return Water Time)	17	Return Water Time)



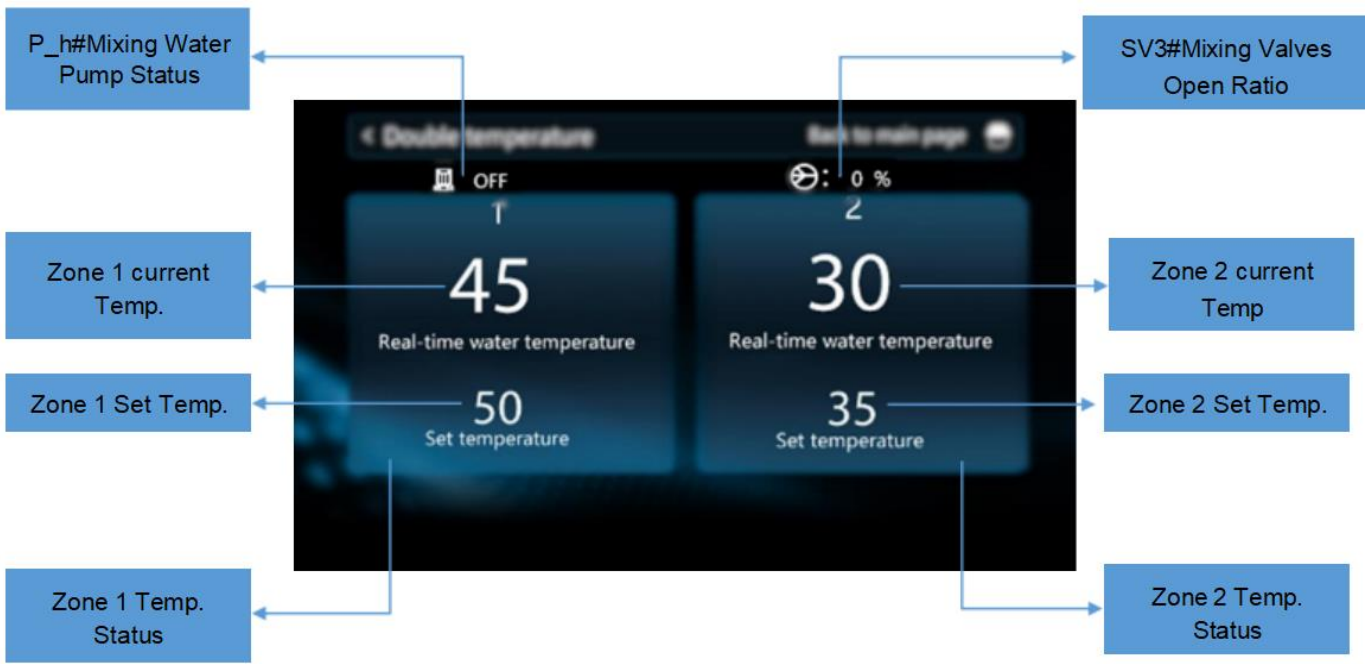
### 3.2.3.3 Daul Temperature Zone Setting

The dual temperature zone control is disable by default, and parameters need to be modified to enable the dual temperature zone control.

1. Enter the factory parameter page and enter the password "2345" .
2. After finding the "P257" parameter, modify the corresponding value to enable the dual temperature zone control. For details, refer to Section 2.7.7
3. After enable dual temperature zone control, click " " to enter the setting page, click " " and find "





3. After entering the page, you can see the dual-zone temperature control page.



### 3.2.3.4 SG Ready Setting

The SG Ready function is disabled by default, and parameters need to be modified to enable the SG Ready function.

1. Enter the factory parameter page and enter the password "2345" .
2. After finding the "P255" parameter, modify the corresponding value to enable the cascade. For details, refer to Section 2.7.8
3. After enable the SG Ready function, click " " to enter the setting page, click " " and find "



4. After entering the page, you can set the maximum running time of the unit when the SG signal and EVU signal are both disconnected.



### 3.2.3.5 Cascade Setting


Cascade is disabled by default. If need to enable, it needs to modify parameters to enable the cascade control.

1. Enter the factory parameter page and enter the password "2345" .
2. After finding the "P164" parameter, modify the corresponding value to enable the cascade. For details, refer to Section 2.7.7

### 3.2.4 Running Status Query

The wire controller can query the running status of the unit. When the unit fails, the running status is provided to the factory for analysis to facilitate fault location.

Running status query method:

1. Click " " to enter the query page.
2. Click "System Parameter" to query the running status of the unit.

Number	Parameter	Value	Unit
1	Compressor operating frequency	0	Hz
2	Fan running frequency/speed	0	Hz
3	Electronic expansion valve steps	0	P
4	EVI valve steps	0	P
5	AC input voltage	0	V

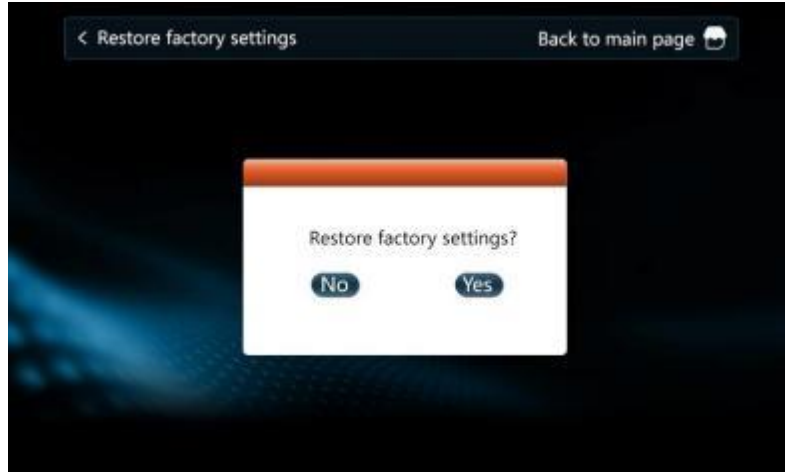
Running status query method in cascade mode:

Select the corresponding slave unit to query the running status of the corresponding unit.

< System Parameters		Back to main page
No.01	No.09	
No.02	No.10	
No.03	No.11	
No.04	No.12	
No.05	No.13	
No.06	No.14	
No.07	No.15	
No.08	No.16	

### 3.2.5 Factory Reset

In setting page, touch "Restore factory settings" to enter the page of resetting to factory setting. Touch "Yes" to confirm to reset to the factory setting.



### 3.2.6 APP & Unit Binding

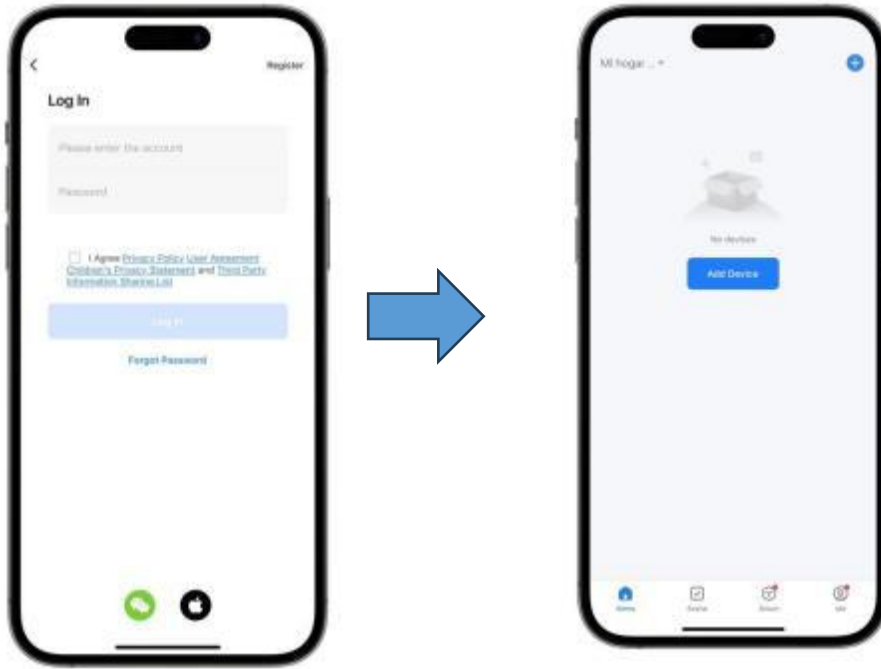
The heat pump supports remote control by mobile phone. You need to download the APP in the app store and register an account to perform network distribution operations. The heat pump supports smart distribution network and AP distribution network. Under normal circumstances, it is recommended to use smart distribution network connection.

For more APP operations, please refer to "Operation Manual."

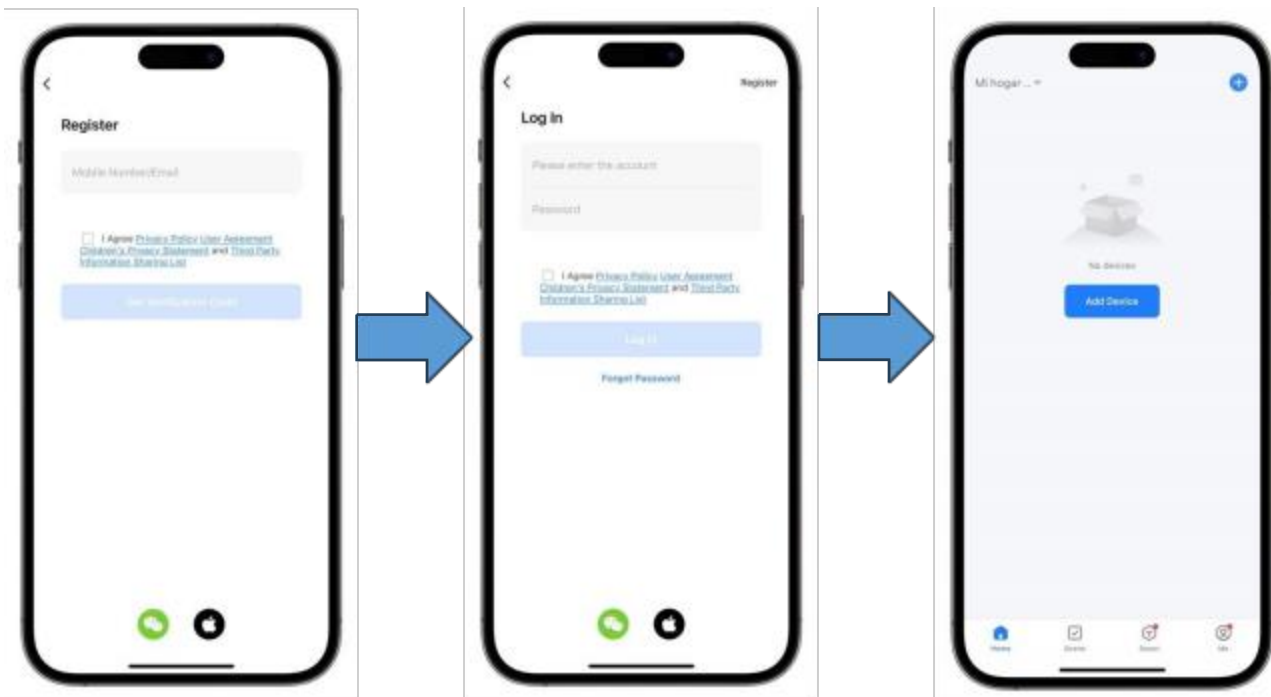
1. Search "Smart Life" in the App Store or scan the following QR code with your mobile phone to download.



2. Enter your account number and password to enter the APP main page.






3. If you log in for the first time, you need to register an account. After registration is completed, enter your account password to enter the APP main page.



### 3.2.6.1 Networking (Smart Mode)

Generally, it is recommended to use smart mode. The wire controller is required to be within WIFI coverage. The wire controller must first enter the network distribution mode. The following is the operation method:


1. Click "" on the wired controller to enter the function setting page.
2. Click " WiFi distribution" to enter the WIFI distribution mode selection page.
3. Click " Intelligent WiFi Distribution Network" to enter smart mode.



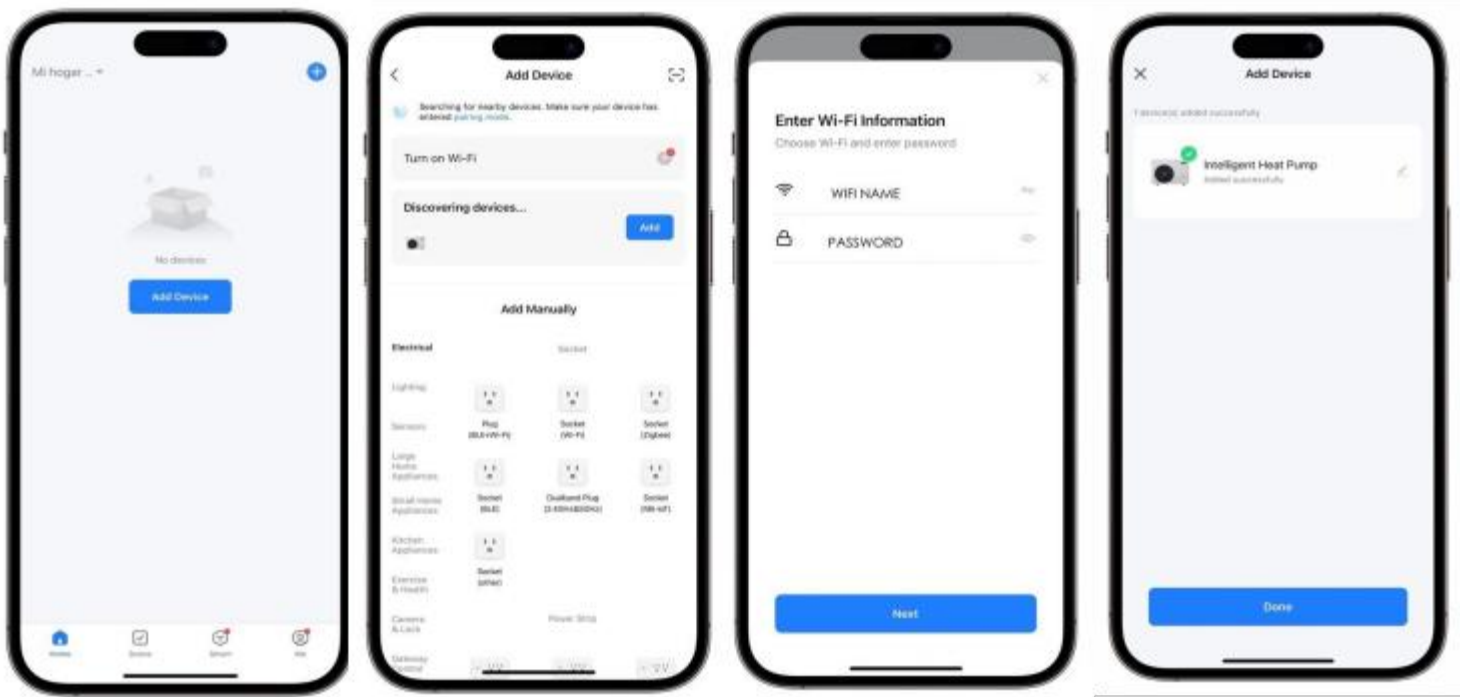
After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.

1. Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "



2. In the Smart mode, the APP will automatically identify the device, click "".
3. After entering the current WIFI account and password, wait for the APP to complete binding.







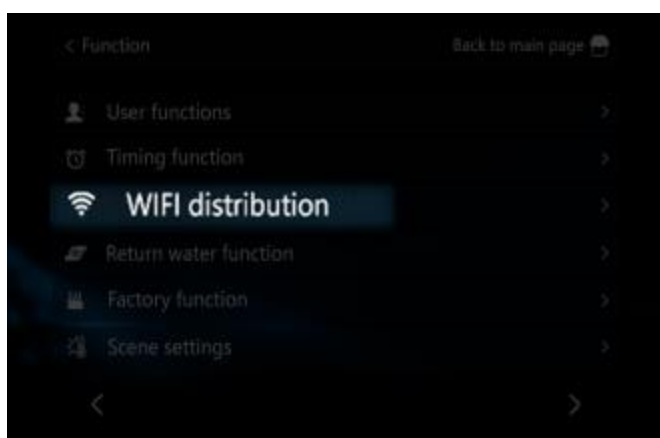
### 3.2.6.2 Networking (AP Mode)

The wire controller is required to be within WIFI coverage.

The wire controller must first enter the network distribution mode.

The following is the operation method:

1. Click "  WIFI distribution " to enter the function setting page.
2. Click "  AP Distribution Network " to enter the WIFI distribution mode selection page.
3. Click " " to enter AP network mode.
4. At this time, the wire controller will transmit a WIFI h

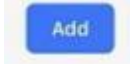


After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.


1. Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "



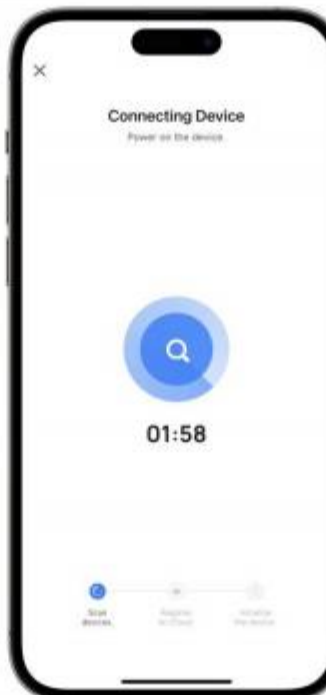
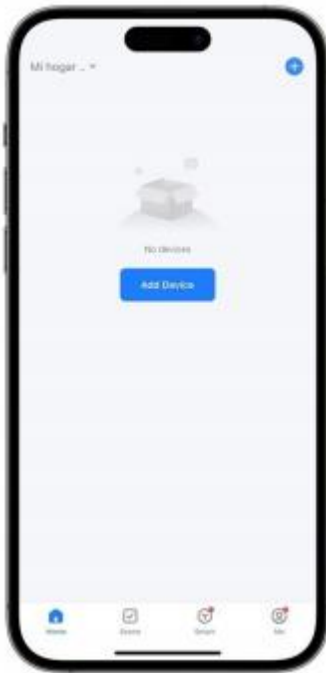
“ .

2. In the Smart mode, the APP will automatically identify the device, click "  ”.

3. Enter the account and password of the WIFI to be connected.

4. Click "  " to enter the WIFI settings page, find the WIFI hotspot named "smartlife-XXXX" or "SL-XXXX" and connect.

5. Wait for the APP to complete binding



## 3.3 Program Upgrade

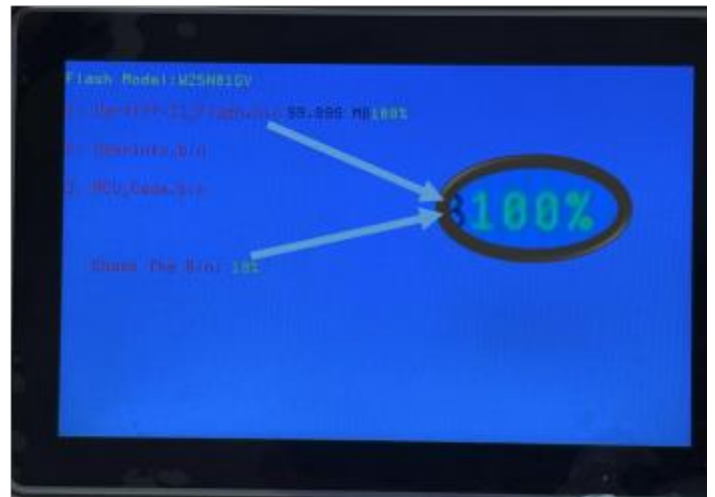
### 3.3.1 Wire Controller

The wire controller supports updating the software version, the following is the program upgrade operation:

Tools:

Computer x1, card reader x1, SD card x1

1. Format the SD card as "FAT32".
2. Copy the file names "MCU\_Code" and "UartTFT\_Flash" to the SD card.
3. Disconnect the wire controller, open the back cover, find the SD card slot, and insert the memory card.
4. Re-power on the wire controller, the wire controller automatically enters the upgrade program.
5. When both "UartTFT-31\_Flash\_prog" and "Check The Bin" progress are 100%, it automatically enters the homepage.
6. Remove the memory card and close the cover, click "Setting" and then click "About" to view the current version information.



### **3.3.2 Motherboard**

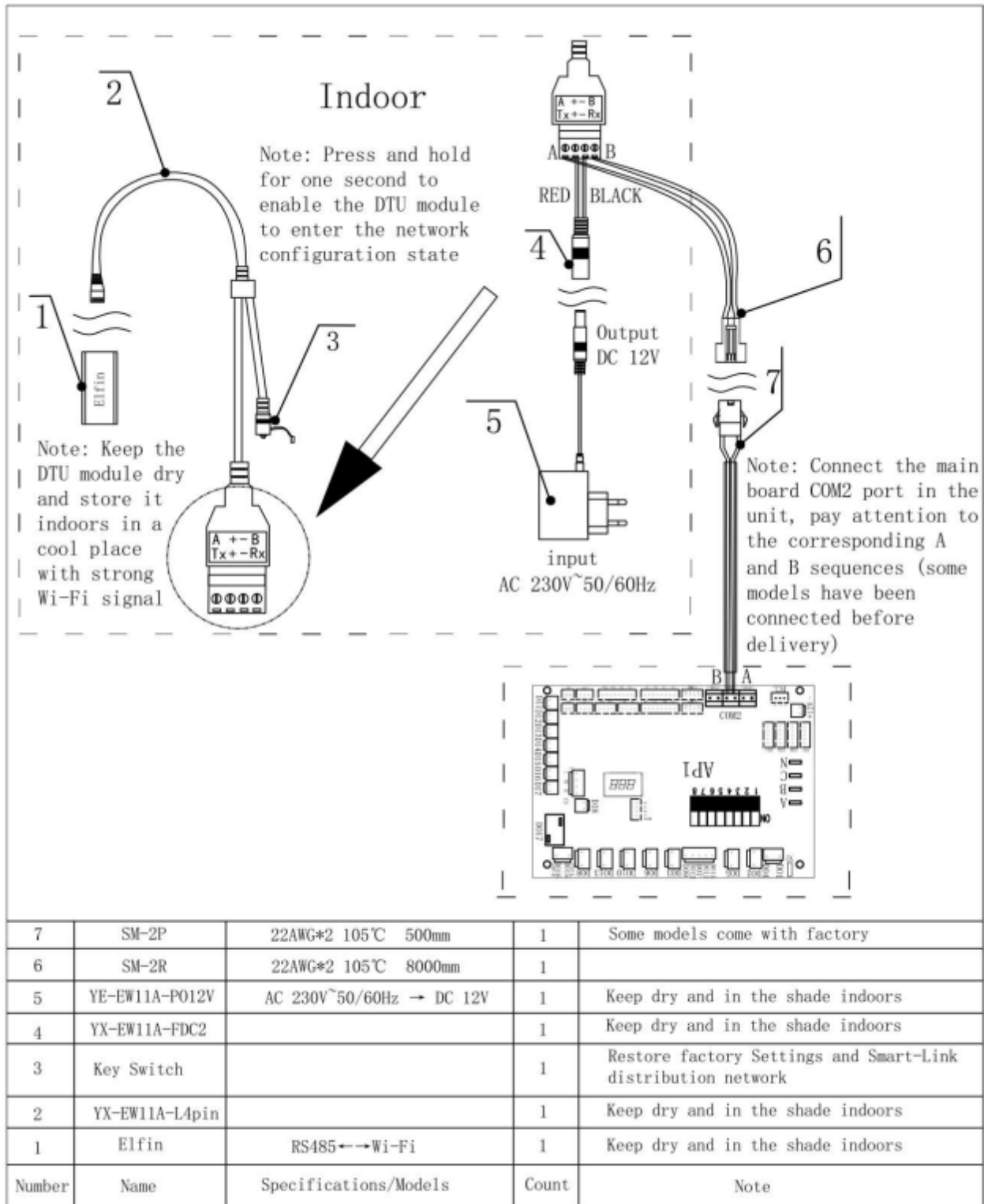
To be improved.

### **3.3.3 OTA**

To be improved.

### 3.4 IoT Platform

#### 3.4.1 DTU Module Connection



### 3.4.2 IoT Products

This system mainly provides remote management of various types of air energy products produced by the company, as well as corresponding equipment, data generated by equipment, events, dealers, accounts , etc.

The detailed function description of the system is as follows:

#### 1. Homepage

In the dashboard, according to the status of the equipment in the system, the number of equipment, fault alarms, and statistical information of users are displayed with intuitive icons.

The real-time display of the operation status of all equipment on the map, as well as the statistics of equipment online status and alarm status. You can click the device logo to view the device information.

#### 2. Product Management

You can create and edit the required product, define the function points of the product and select the data that this product needs to pay attention to.

#### 3. Device management

of each device, including the following functions:

- Equipment list: Display all equipment and related properties in real time in the form of a list, and you can view the detailed information of the equipment.
- Equipment storage: Import equipment into the system.
- Equipment out of the warehouse: assign the equipment out of the warehouse to the designated dealer.

#### 4. Incident Management

- Alarm list: Display the alarm records generated by the equipment in the system in the form of a list, and view the details of the alarm processing.
- Device log: display the historical data reported by the device in the form of a list, display the original binary data reported by the device, and analyze and display the binary data.

#### 5. Dealer Management

Manage the dealer account, which can set the associated products for the dealer.

#### 6. User Management

- User list:

It mainly provides the display and editing functions of the user information of the currently logged-in user, as well as the management of registered users using the client APP, including viewing the list of devices bound to the user and releasing the binding relationship between the user and the device.

- User Feedback: It mainly deals with the feedback information submitted by users in the APP.

#### 7. System

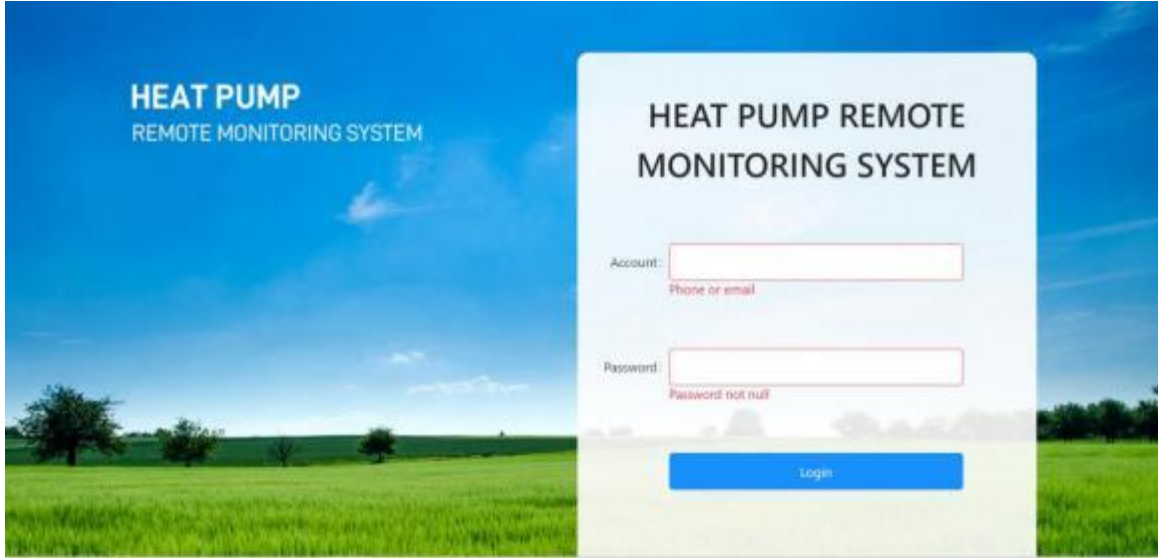
- Account management: manage accounts other than dealers in the system, create required roles, and assign roles to accounts.
- Role management: manage the roles in the system, specify the access rights and operation rights of various functions in the system for the roles.
- APP management: manage the corresponding APP information in the system.

### 3.4.3 Login System

#### 3.4.3.1 User Login

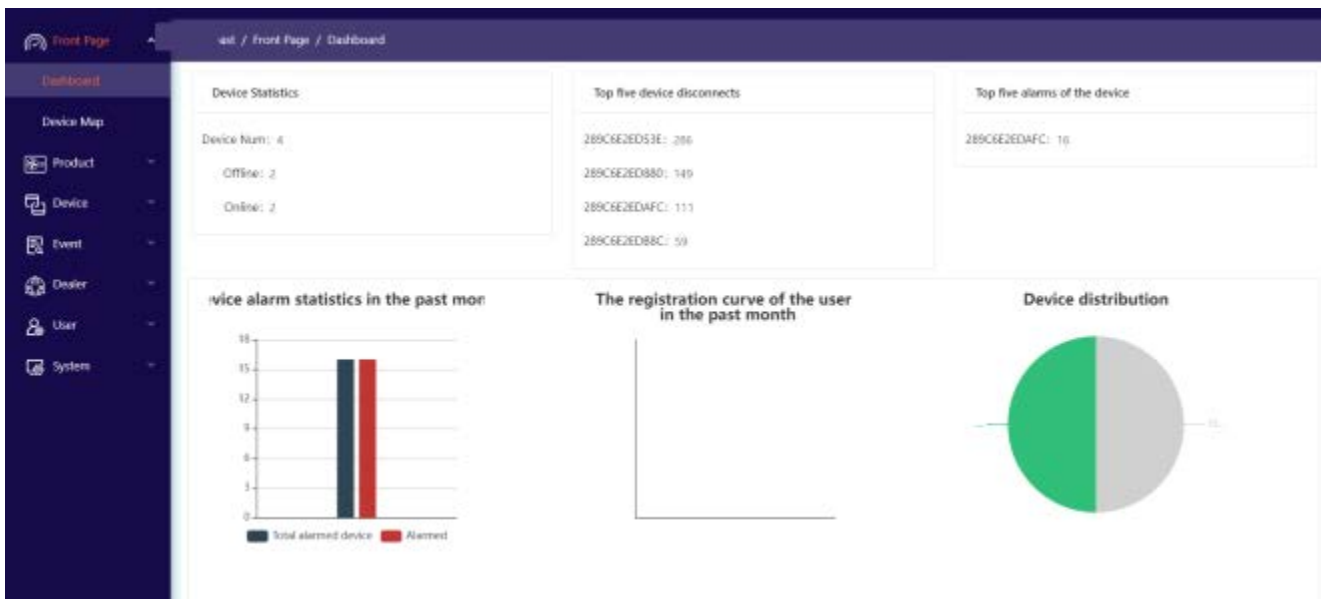
Enter <https://saas.mysmartiot.com/> in the address bar of the browser, and the login page will be displayed by default after the web page opens, as shown in the figure below:

Entering the account name and password required for login, click Login , and enter the system after successful login .



#### 3.4.3.2 Dashboard

Display device statistics in the form of charts, as shown in the figure below:



- 1.Count the number of devices in each state.
- 2.Count the top five devices with the number of dropped calls and display the number of dropped calls.
- 3.Count the top five devices with the number of alarms and display the number of alarms.

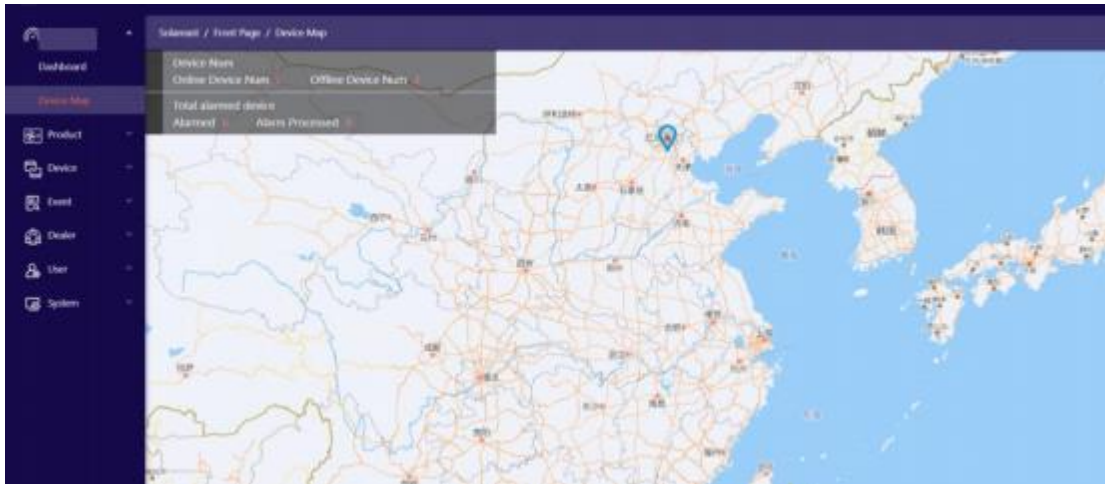


4. In the form of a bar chart, the device alarm status in the past month and the number of devices in each state are displayed.

5. The proportion distribution of online and offline devices in the form of a pie chart.

### 3.4.3.3 Monitoring Page

Display the device associated with the current user on the map according to the location of the device:

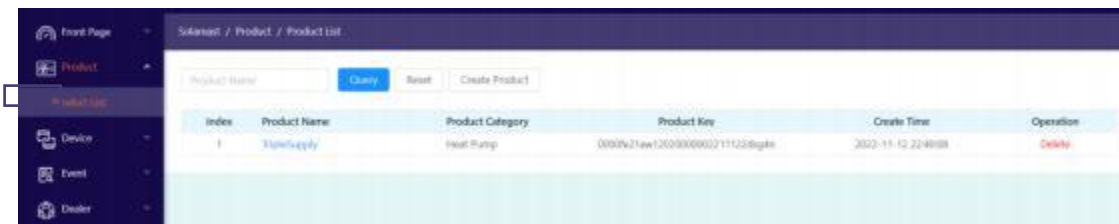


Click the device logo in the map to pop up the relevant information of the device, as shown in the figure above.

### 3.4.4 Products

#### 3.4.4.1 Product List

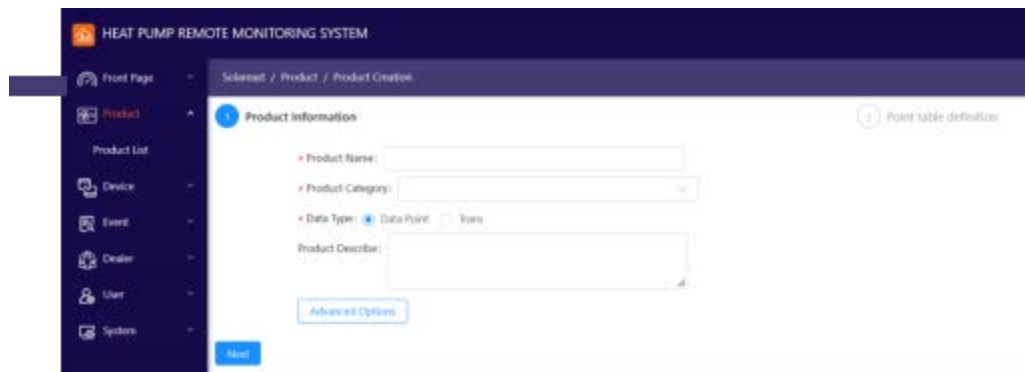
Types created in the current system in the form of a list. Products can be deleted.



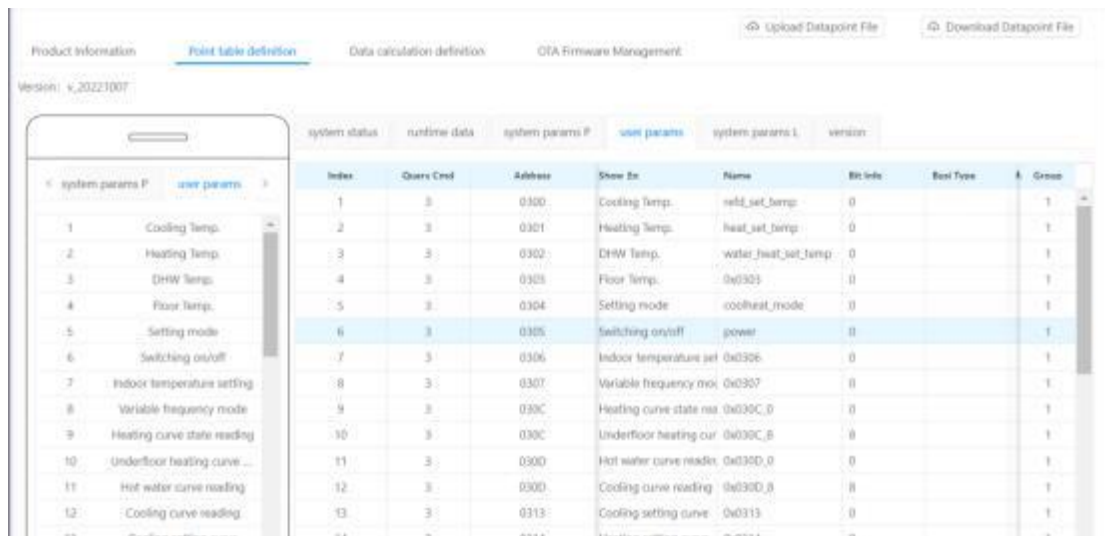
#### 3.4.4.2 Create and Edit

(1) .Create Product

Click "Create Product" in the product list to open the product creation page, as shown below:



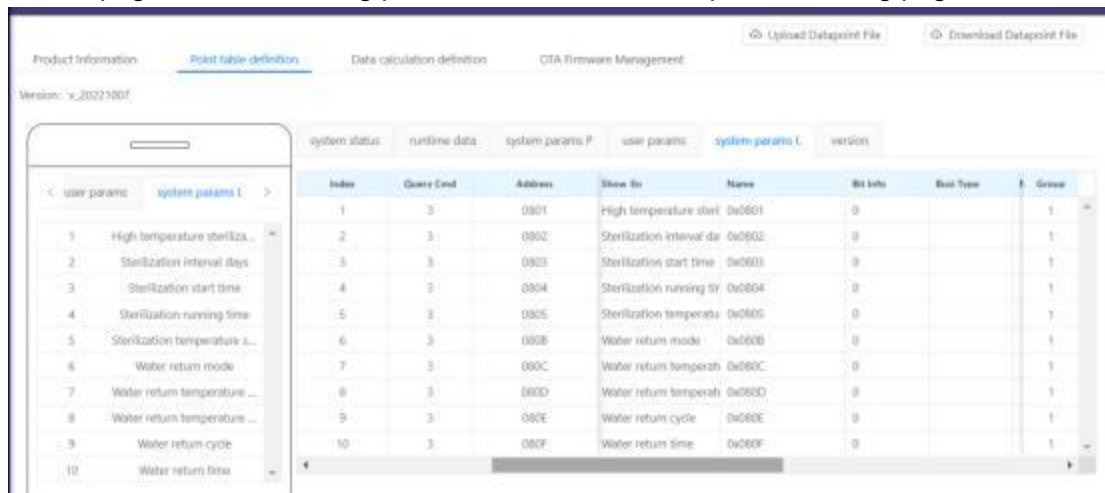
After filling in the required basic information, if the data type selects "Transparent Transmission", click Save to complete the product creation; if the data type selects "Point Table", click Next to edit the point table:



After clicking Finish, the product is successfully created.

## (2) .Product Editing

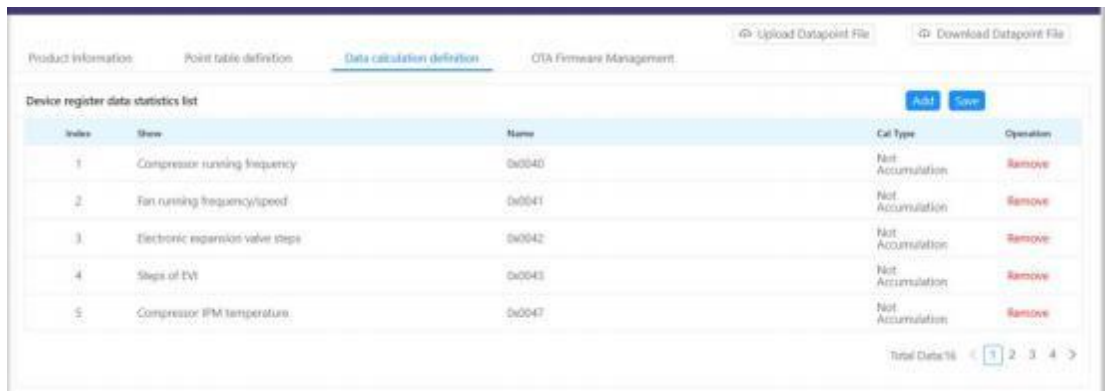
On the product list page, click an existing product name to enter the product editing page, as shown below:



By default, the point table information defined by this product is displayed. The user can download the excel file corresponding to the product point table information by downloading the configuration file, edit it and upload it again to edit the point table.

Users can also modify the basic information of the product on the edit page.

The concerned data can be specified in the "Data Calculation Definition", and the calculation formula can be defined, as shown in the figure below:



The screenshot displays a web interface for defining data calculations. At the top, there are navigation tabs: "Product Information", "Point table definition", "Data calculation definition" (which is active), and "OTA Firmware Management". To the right of these tabs are two buttons: "Upload Datapoint File" and "Download Datapoint File". Below the tabs, there are two buttons: "Add" and "Save". The main content is a table titled "Device register data statistics list". The table has five columns: "Index", "Item", "Name", "Cal Type", and "Operation". It contains five rows of data, each representing a different device register. At the bottom right of the table, there is a pagination control showing "Total Data: 5" and a set of navigation buttons: "< 1 2 3 4 >".

Index	Item	Name	Cal Type	Operation
1	Compressor running frequency	0x0040	Net Accumulation	Remove
2	Fan running frequency/speed	0x0041	Net Accumulation	Remove
3	Electronic expansion valve steps	0x0042	Net Accumulation	Remove
4	Steps of EVI	0x0043	Net Accumulation	Remove
5	Compressor RPM temperature	0x0047	Net Accumulation	Remove

User-selected data can be viewed in the device analytics for individual devices.

### 3.4.5 Equipment

#### 3.4.5.1 Equipment List

Click Device List in the menu to open the Device List page, displaying all devices in the current system:

Index	IMEI	Device Name	Online Stat...	Alarm Status	Product Name	Distributor	Operation
1	289C6E2ED4FC	MyDevice	Offline	UnAlarmed	TipSupply		Data Binding Delete
2	289C6E2ED58C		Offline	UnAlarmed	TipSupply		Data Binding Delete
3	289C6E2ED53E	Office	Offline	UnAlarmed	TipSupply		Data Binding Delete
4	289C6E2ED680		Offline	UnAlarmed	TipSupply		Data Binding Delete
5	289C6E2ED602	Micoe	Offline	UnAlarmed	TipSupply		Data Binding Delete
6	289C6E2ED610		Offline	UnAlarmed	TipSupply		Data Binding Delete
7	289C6E2ED68A		Offline	UnAlarmed	TipSupply	TTT	Data Binding Delete
8	289C6E2ED68D		Offline	UnAlarmed	TipSupply		Data Binding Delete
9	289C6E2ED6AC		Offline	UnAlarmed	TipSupply	T	Data Binding Delete

Users can query based on device online status, IMEI, product and dealer, and perform related functions on a single device.

Index	IMEI	Online Status	Alarm Status	Product Name	Distributor	Operation
1	289C6E2ED4FC	Offline	UnAlarmed			Device Data Bind Device List Delete
2	289C6E2ED680	Offline	UnAlarmed			Device Data Bind Device List Delete
3	289C6E2ED53E	Online	UnAlarmed			Device Data Bind Device List Delete
4	289C6E2ED58C	Online	UnAlarmed			Device Data Bind Device List Delete



mac:289C6E91DE02

China Mo... 11:38

My Device

No Devices, Please Add Device

Add By Scan

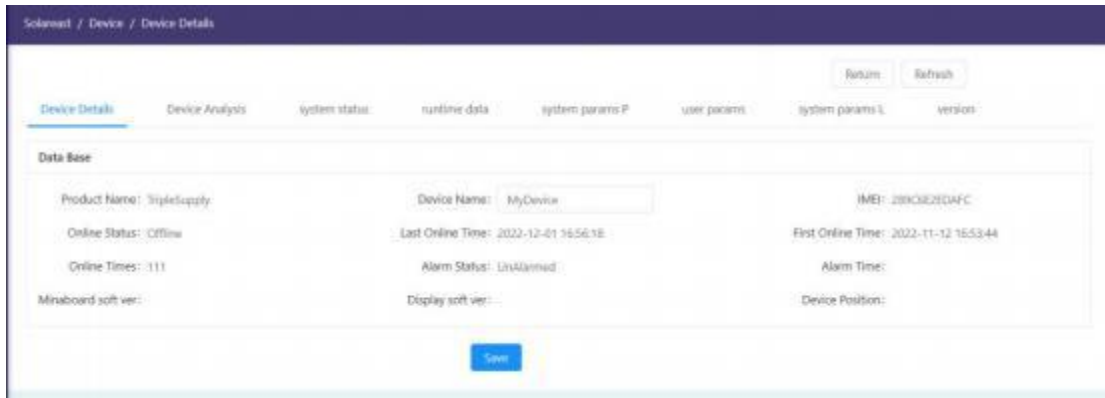
Add By WIFI

Device My

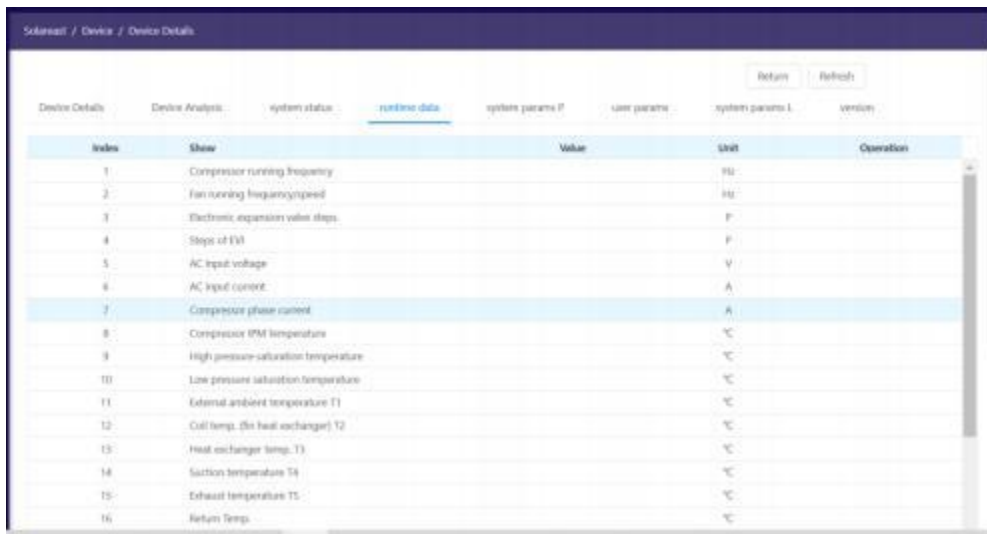
Click the QR code icon at the IMEI to display the shared QR code of the device and use the mobile APP to scan the code to add this user device and realize the binding.

#### a) Device Data

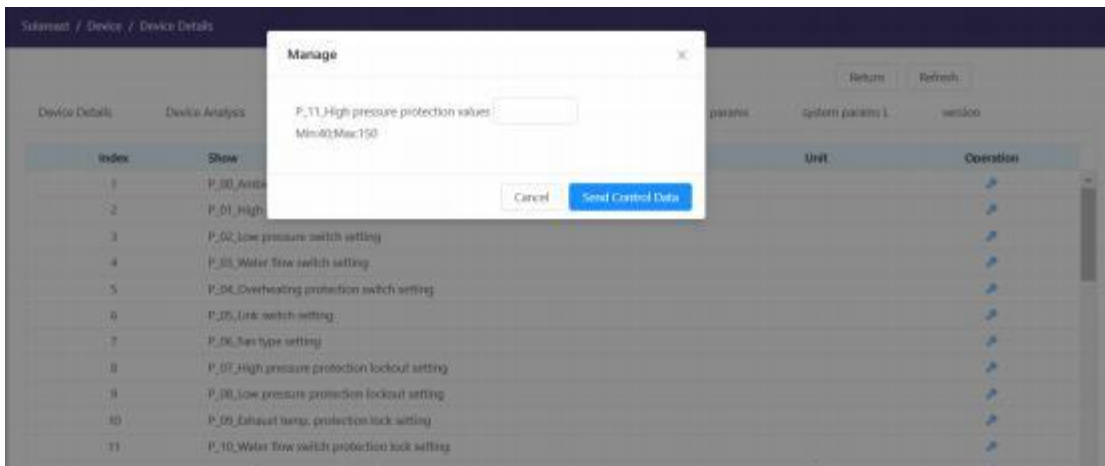
Click "Device Data" to see the detailed information of this device, as shown in the figure below:



Select different Tab pages to view the corresponding device parameter information:

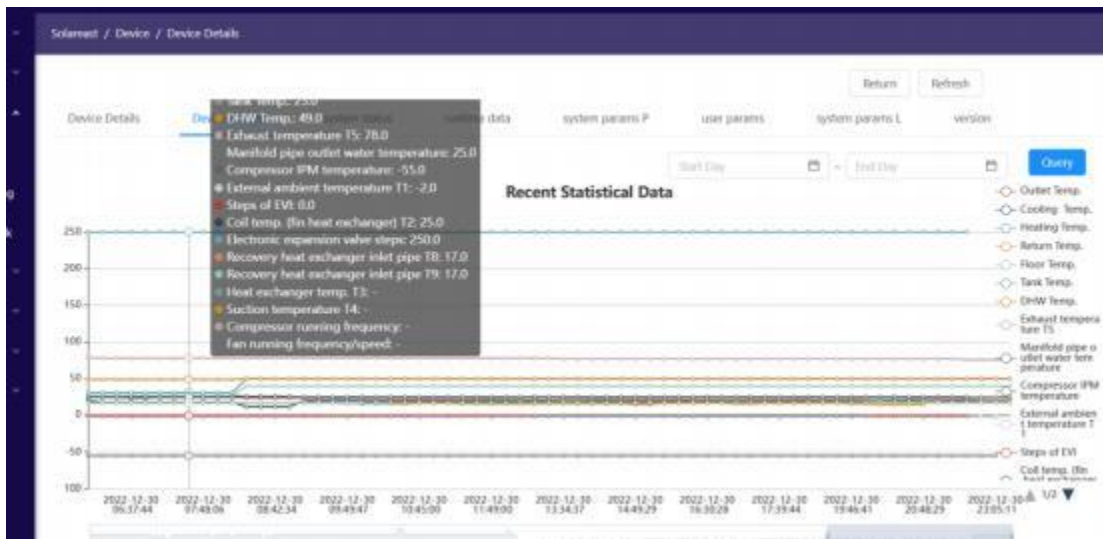


For parameters that can be remotely maintained and modified, new parameters can be set and sent to the device:



Click "Send Control Command" to send this parameter value to the device.

The Equipment Analysis page is used to plot the data points selected by the user in the product definition:



The data corresponding to the time can be queried by setting the time, the display of parameters can be controlled by clicking the legend, and the display area can be enlarged or reduced by sliding the mouse.

b) Bind user list.

Click "Bind List" in the device list to open the device's bound user list page, displaying the list of users bound to this device.

The screenshot shows the 'Bind user list' page with a table containing the following data:

Index	User Name	Phone	Role Name
1	091		24
2	091		09
3	12091		18:19:43

c) delete device

Click "Delete" in the device list to delete the current device, as follows:

The screenshot shows the 'Equipment List' page with a table containing the following data:

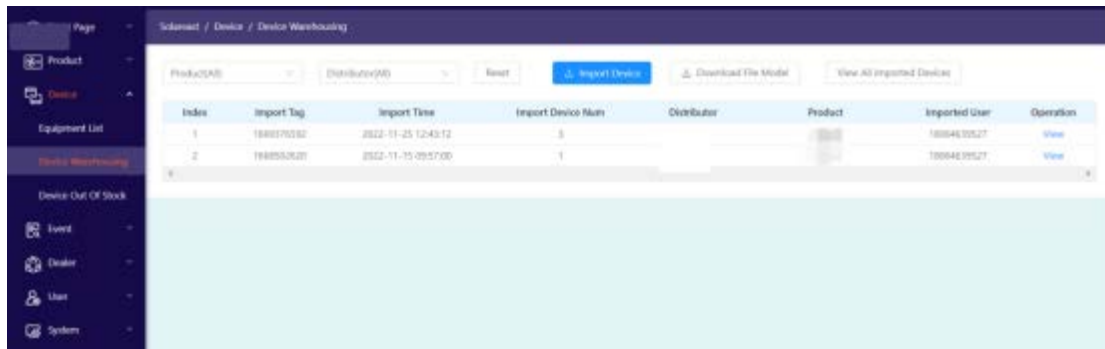
Index	IMEI	Online Status	Alarm Status	Product Name	Distributor
1	289C6E2ED4FC	Offline	UnArmed		
2	289C6E2ED480	Offline	UnArmed		
3	289C6E2ED53E	Online	UnArmed		
4	289C6E2ED08C	Online	UnArmed		

A 'Delete device confirm' dialog box is overlaid on the right side of the table, with 'Confirm' and 'Cancel' buttons.

After clicking "Confirm", the device will be deleted from the system.

### 3.4.5.2 Equipment Storage

The administrator can use the IMEI list of the WiFi module to import the equipment to be produced into the system through this function for subsequent management. When importing, you need to specify the product type, and the dealer information cannot be left unselected.



Filter by product, distributor. You can view a single imported device as well as all imported devices.

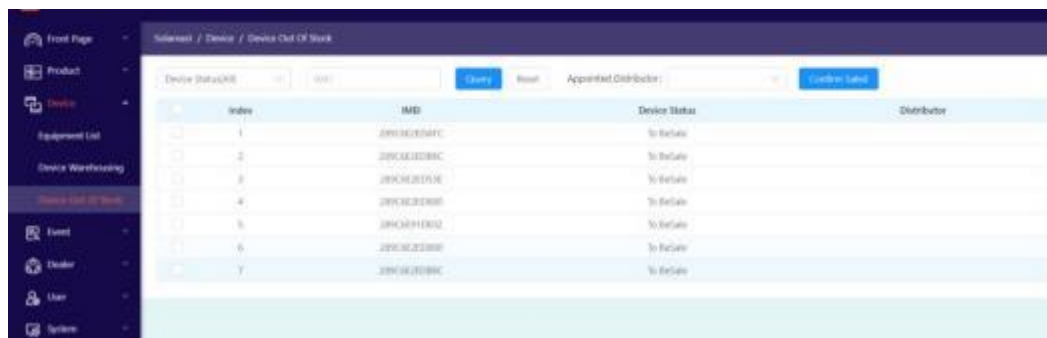
By clicking "Download Import Template", you can download the excel template used to import the device. The imported device template is as follows:

	A	B
1	IMEI	
2	289C6E2EDB8C	
3	289C6E2ED53E	
4	289C6E91DE02	
5	289C6E2ED880	
6		
7		
8		
9		

### 3.4.5.3 Equipment Out of the Warehouse

Use this function to assign devices to dealers.

After selecting the designated dealer, check the equipment to release the warehouse. After the warehouse is released, the dealer account logs in to the system, and you can see the equipment shipped to your own account in the equipment list.



### 3.4.6 Events

#### 3.4.6.1 Alarm List

Display the alarm records of the device in the form of a list, as shown in the figure below:

Index	IMEI	Device Name	Alarm Time	Alarm Content	Alarm Status
1	2001		2022-11-12 16:54:47		Alarmed
2	2001		2022-11-12 16:54:47		Alarmed
3	2001		2022-11-12 16:54:47		Alarmed
4	2001		2022-11-12 16:54:47		Alarmed
5	2001		2022-11-12 16:54:47		Alarmed
6	2001		2022-11-12 16:54:47		Alarmed
7	2001		2022-11-12 16:54:47		Alarmed
8	2001		2022-11-12 16:54:47		Alarmed
9	2001		2022-11-12 16:54:47		Alarmed
10	2001		2022-11-12 16:54:47		Alarmed

It can be queried according to IMEI and alarm time.

### 3.4.6.2 Device Logs

Information reported by the device in the form of a list, and display the original binary data:

Index	IMEI	Product Name	Time	Date	Detail
Supply List					

Filter queries can be performed according to product, IMEI and time.

Click "View" to display the parsed content of the current line of binary data.

Click the "Export" button to save the analyzed value of the device log data to the excel table.

### 3.4.7 Dealer Management

#### 3.4.7.1 Dealer List

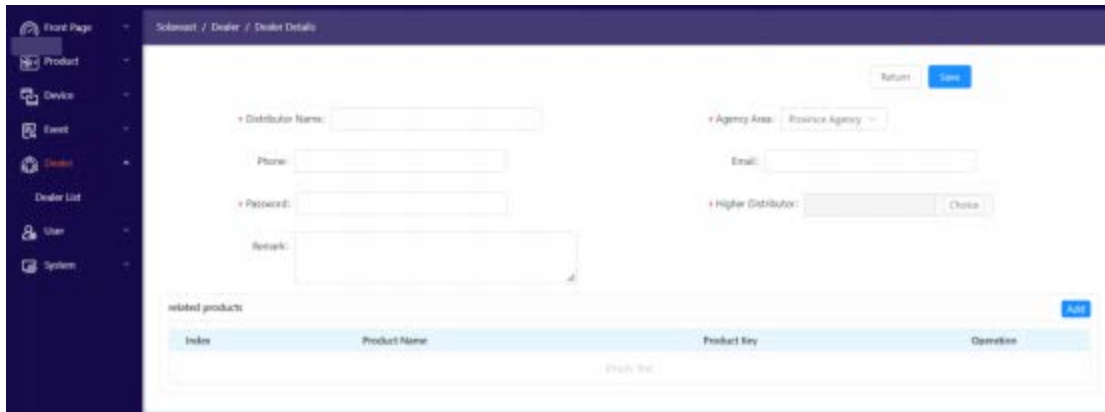
Display dealer data in list form. Filter query display and operation can be performed according to dealer name and dealer grade. Resellers can be deleted.

Index	Distributor Name	Distributor Level	Agency Area	Higher Distributor	Create Time	Operation
Supply List						

#### 3.4.7.2 Create and Edit

Click "Create a dealer" on the dealer list page to open the dealer creation page, as shown below:





A parent distributor and associated products can be designated for this distributor. On the dealer list page, click on the dealer's name to edit the dealer information.

### 3.4.8 User Management

#### 3.4.8.1 User List

the user information registered through the APP in the form of a list:



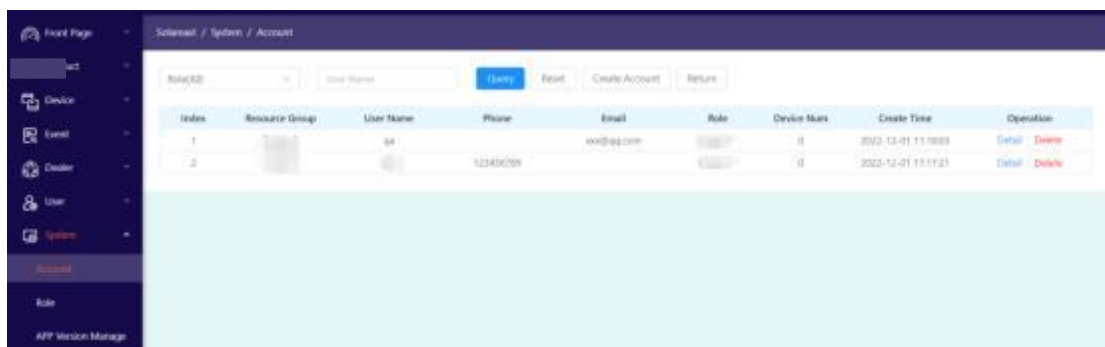
It can be filtered according to the mobile phone number and username, and the list of devices bound to the user can be viewed.

You can unbind a device bound to the user.

### 3.4.9 System

#### 3.4.9.1 Account

Manage other system accounts except dealers. Display account information in the form of a list, which can be filtered according to roles and user names, as follows:



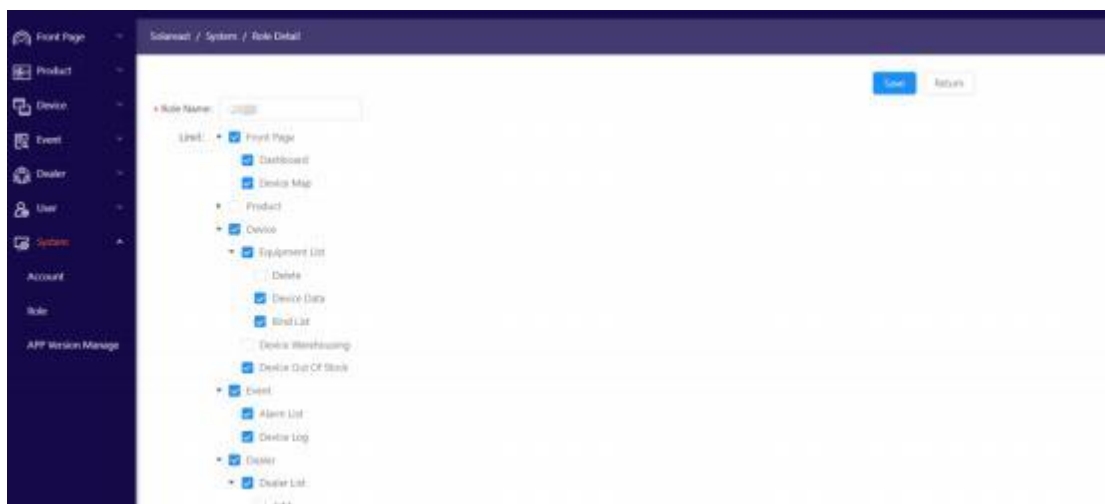
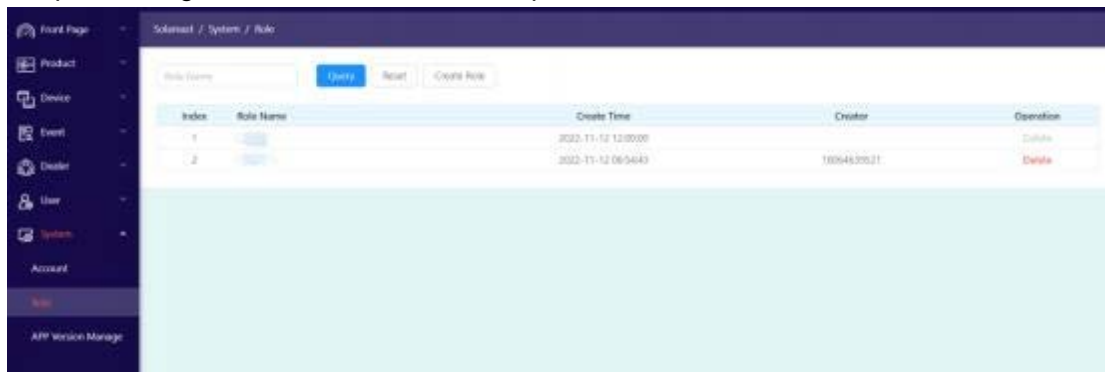
Accounts can be deleted.

Click "Create Account" to open the account page to create a new user account.

Click "Details" in the account list to open the account details page, edit and save the account information.

### 3.4.9.2 Role Management

In this function, the roles required for system management are defined, and the access rights of system functions and operation rights of some functions are specified for the roles.



Checking the box means assigning permissions to this role. A role is assigned to an account when the account is created.

### 3.4.9.3 APP Management

This function is used to manage the corresponding APP information in the system.

Index	App Name	App Key	App Platform	Distributor	Version	Operation
1	SmartHeatPump	aa4472e65e6e27a223d54477534180	iOS		1.6.5	<a href="#">Detail</a>
2	SmartHeatPump	6ee9d8921125405a11292513a6c1d675	Android		1.6.5	<a href="#">Detail</a>

### 3.4.10 APP (Smart Heat-Pump)

The smart heat pump APP can remotely control the heat pump equipment, monitor the operating status, and intelligent alarm anytime and anywhere, providing users with a smart, comfortable, and convenient home life experience.

#### 3.4.10.1 Download & Login

Search for "Smart Heat-Pump" in the app store or scan the QR code below to download the app.



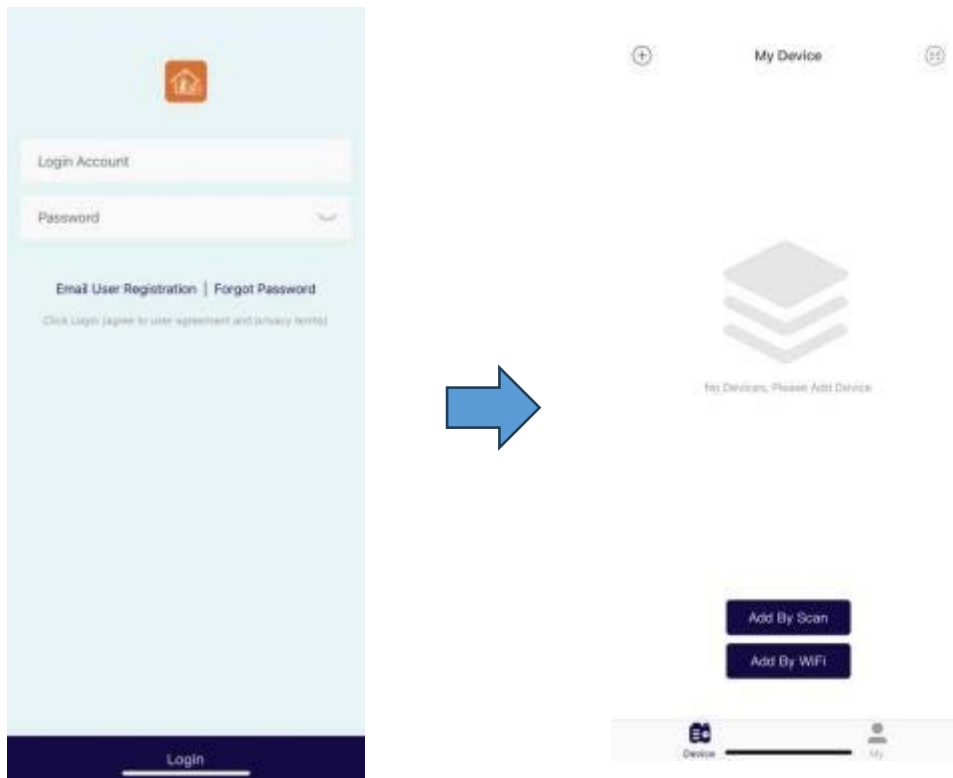
For IOS



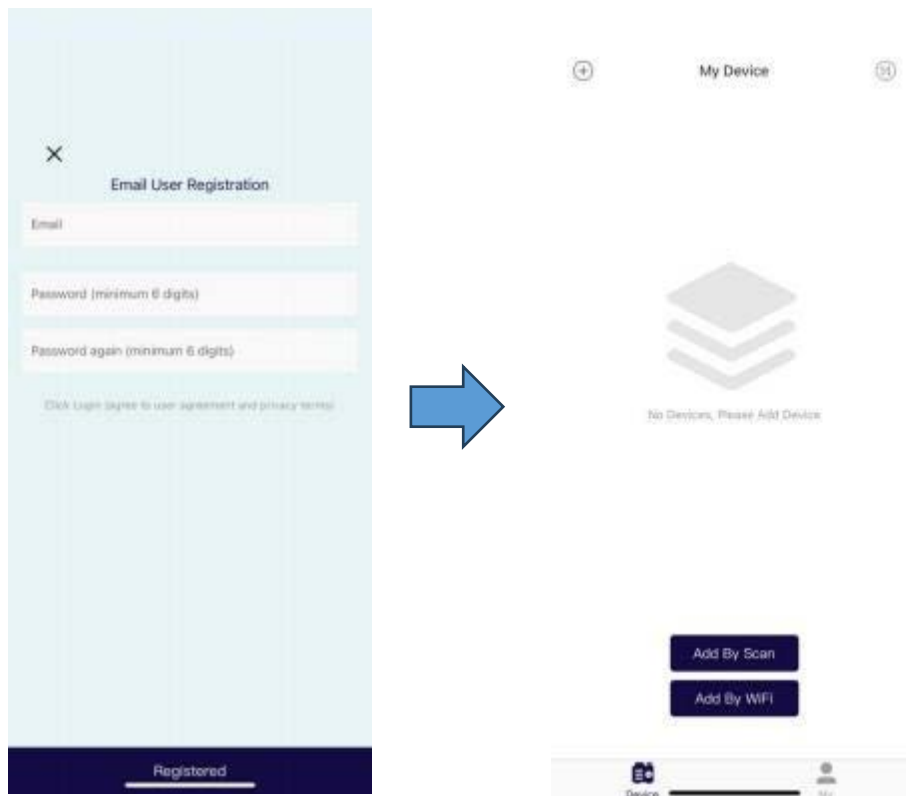
For Android OS

Login & Register Steps:

1. Open the APP, enter your account and password to enter the binding page.



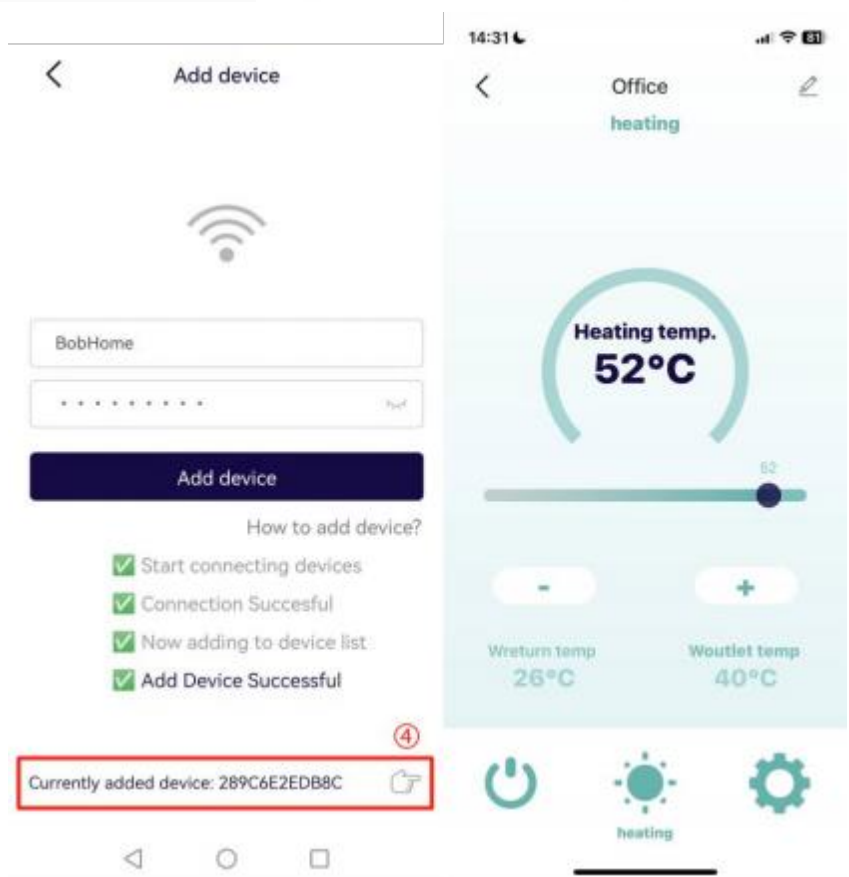
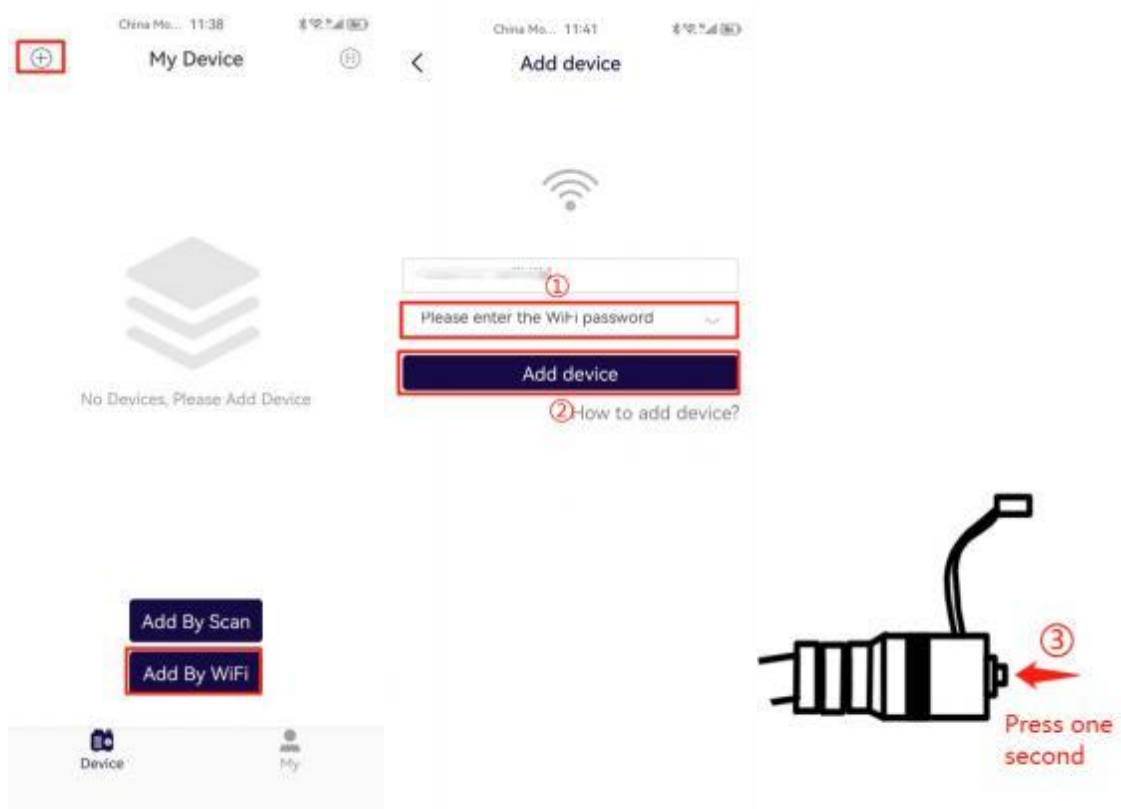
2. If you don't have an account, click "Register" to enter the registration page.
3. Enter your email and password to register and enter the binding page successfully.



### 3.4.10.2 Add Device

There are two ways to bind the device, through WIFI or through scanning the code to bind the device.  
Binding via WIFI:

1. After the mobile phone is connected to Wi-Fi, check the Wi-Fi account, and enter the correct Wi-Fi password
2. Click to add a device, then start searching for devices
3. Press and hold the button for 1 second and then let go, the green light of the Elfin box starts to flash quickly, and it enters the distribution network state
4. Wait for a few seconds, after the connection is successful, click the bottom of the screen to enter the device control interface



Bind the device by scanning the code:

1. On the device list page, click the scan code to add (the button on the right of the picture above), and you can scan the code to add the device.

2. this scan box with the QR code of the shared device to complete the scan code to add the device.

3. The successfully added device will appear in the user's device list.



### 3.4.10.3 Device List

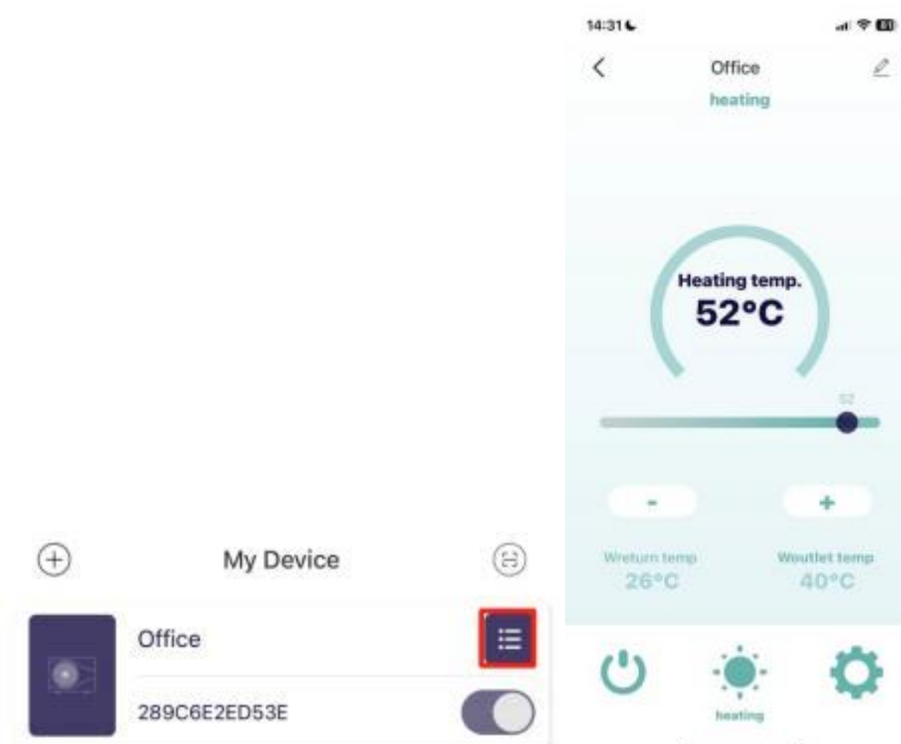




User can disassociate from the device. When sliding to the left in the device list, a delete button will appear on the right side of the device row. Click Delete to disassociate the user from the device, as shown in the figure below:





Click the icon in the upper right corner in the figure below to enter the control page of the device.



Click the left icon in the above figure to display the sharing QR code of the device, which is used to share the device with other user members in the family to bind the device.

### 3.4.10.4 Control Page



1. Click on a device in the device list to enter the control page of this device
2. The upper right corner is used for the user to customize its name in the App for the device.
3. The temperature setting values under different working modes are displayed on the main interface. set the desired setting value by clicking  ,  or the slider.
4. The page also displays two items of return water temperature, outlet water temperature or water tank temperature according to different working modes.
5. The bottom three buttons, from left to right are: device switch, working mode, setting parameters.
  - 5.1 Click the device to switch on and off, and then you can check the working status and control operation of the device after turning it on.
  - 5.2 Click the working mode to see the mode selection menu, and you can modify the working mode of the device.
  - 5.3 Click the parameter setting button to view and set the detailed parameter information of the device.



When an alarm occurs on the device, a yellow triangle icon will be displayed on the page, and the content of the alarm information will be displayed. Click this alarm icon to jump to the detailed parameter page.

### 3.4.10.5 Parameter Query

1. Click the parameter setting on the main control page of the device to enter this page.



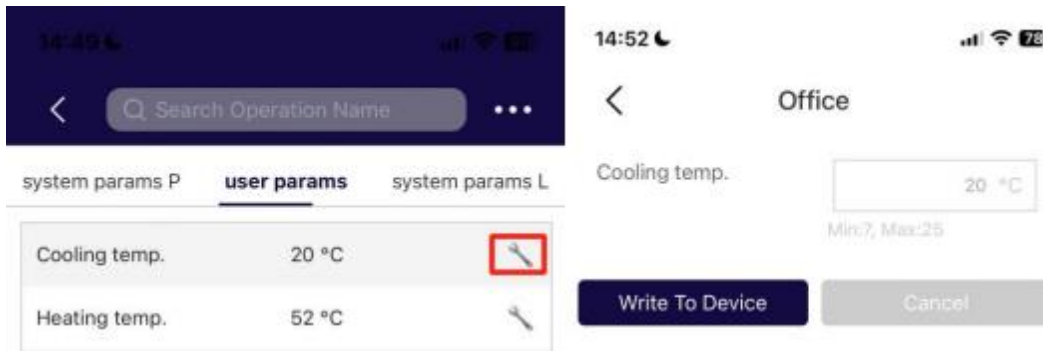
2. Device parameters are divided into the following label categories:

Unit real-time status, real-time data, unit system parameters P, user parameters, unit system parameters L, version information

Parameter	Value
Compressor running frequency	0 Hz
Fan running frequency/speed	0 Hz
Electronic expansion valve steps	0 P
Steps of EVI	0 P
AC input voltage	0 V
AC input current	0.00 A
Compressor phase current	0.00 A
Compressor IPM temperature	0 °C
High pressure saturation	0 °C
Low pressure saturation	0 °C
External ambient temperature T1	0 °C
Coil temp. (fin heat exchanger) T2	0 °C
Heat exchanger temp. T3	0 °C
Suction temperature T4	0 °C
Exhaust temperature T5	0 °C
Return Temp.	0 °C

3. Users can view the values of different parameters

For parameters that can be modified, click the setting icon on the right side of the corresponding row to modify its setting value, as shown in the figure below:



5. Click the ... icon in the upper right corner to view the historical alarm data of this device :

\*\*\*

system status  
runtime data  
system params

Compressor running frequency	0 Hz
Fan running frequency/speed	0 Hz
Electronic expansion valve steps	0 P
Steps of EVI	0 P
AC input voltage	0 V
AC input current	0.00 A
Compressor phase current	0.00 A
Compressor IPM temperature	0 °C
High pressure saturation	0 °C
Low pressure saturation	0 °C
External ambient temperature T1	0 °C
Coil temp. (fin heat exchanger) T2	0 °C
Heat exchanger temp. T3	0 °C
Suction temperature T4	0 °C
Exhaust temperature T5	0 °C
Return Temp.	0 °C

Historical Data

Expansion board communication	2022-12-26 13:39:09
On-line units mismatch	2022-12-26 13:38:56
On-line units mismatch	2022-12-24 15:54:18
On-line units mismatch	2022-12-24 10:30:45
Expansion board communication	2022-12-24 10:02:11
On-line units mismatch	2022-12-24 08:37:50

## 4 Appendix

### 4.1 Climate Temperature Curves

By selecting the corresponding climate compensation curve, the unit automatically adjusts the water outlet temperature according to the ambient temperature, and the following is the designation of the climate compensation curve on the wire controller:

High Temperature Curve for Heating		Low Temperature Curve for Heating	
Curves No.	Corresponding Curve	Curves No.	Corresponding Curve
HH1	Heating Curve 1	HL1	Heating Curve 1
HH2	Heating Curve 2	HL2	Heating Curve 2
HH3	Heating Curve 3	HL3	Heating Curve 3
HH4	Heating Curve 4	HL4	Heating Curve 4
HH5	Heating Curve 5	HL5	Heating Curve 5
HH6	Heating Curve 6	HL6	Heating Curve 6
HH7	Heating Curve7	HL7	Heating Curve7
HH8	Heating Curve 8	HL8	Heating Curve 8

High Temperature Curve for Cooling		Low Temperature for Curve Cooling	
Curves No.	Corresponding Curve	Curves No.	Corresponding Curve
CH1	Heating Curve 1	CL1	Heating Curve 1
CH2	Heating Curve 2	CL2	Heating Curve 2
CH3	Heating Curve 3	CL3	Heating Curve 3
CH4	Heating Curve 4	CL4	Heating Curve 4
CH5	Heating Curve 5	CL5	Heating Curve 5
CH6	Heating Curve 6	CL6	Heating Curve 6
CH7	Heating Curve 7	CL7	Heating Curve 7
CH8	Heating Curve 8	CL8	Heating Curve 8

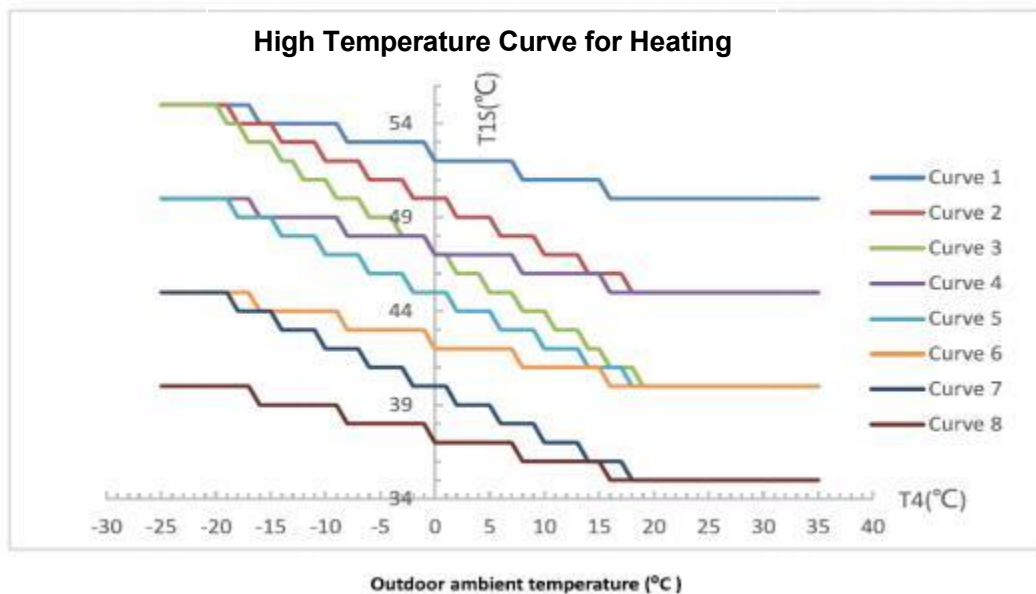
### 4.1.1 Heating Curves

High Temperature Curve for Heating (HH Curve)							
HH1		HH2		HH3		HH4	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
≥16	50	≥17	45	≥16	45	≥19	40
8≤T<16	51	14≤T<17	46	8≤T<16	46	16≤T<19	41
0≤T<8	52	10≤T<14	47	0≤T<8	47	13≤T<16	42
-8≤T<0	53	6≤T<10	48	-8≤T<0	48	10≤T<13	43
-16≤T<-8	54	2≤T<6	49	-16≤T<-8	49	7≤T<10	44
<-16	55	-2≤T<2	50	<-16	50	4≤T<7	45
/	/	-6≤T<-2	51	/	/	1≤T<4	46
/	/	-10≤T<-6	52	/	/	-2≤T<1	47
/	/	-14≤T<-10	53	/	/	-5≤T<-2	48
/	/	-20≤T<-14	54	/	/	-8≤T<-5	49
/	/	<-20	55	/	/	-10≤T<-8	50
/	/	/	/	/	/	-12≤T<-10	51
/	/	/	/	/	/	-14≤T<-12	52
/	/	/	/	/	/	-16≤T<-14	53
/	/	/	/	/	/	-18≤T<-16	54
/	/	/	/	/	/	<-18	55

HH5		HH6		HH7		HH8	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
≥17	40	≥16	40	≥17	35	≥16	35
14≤T<17	41	8≤T<16	41	14≤T<17	36	8≤T<16	36
10≤T<14	42	0≤T<8	42	10≤T<14	37	0≤T<8	37
6≤T<10	43	-8≤T<0	43	6≤T<10	38	-8≤T<0	38
2≤T<6	44	-16≤T<-8	44	2≤T<6	39	-16≤T<-8	39
-2≤T<2	45	<-16	45	-2≤T<2	40	<-16	40
-6≤T<-2	46	/	/	-6≤T<-2	41	/	/
-10≤T<-6	47	/	/	-10≤T<-6	42	/	/
-14≤T<-10	48	/	/	-14≤T<-10	43	/	/
-20≤T<-14	49	/	/	-20≤T<-14	44	/	/
<-20	50	/	/	<-20	45	/	/

**NOTE:** Curve 4 and Curve 6 are ECO energy saving curves



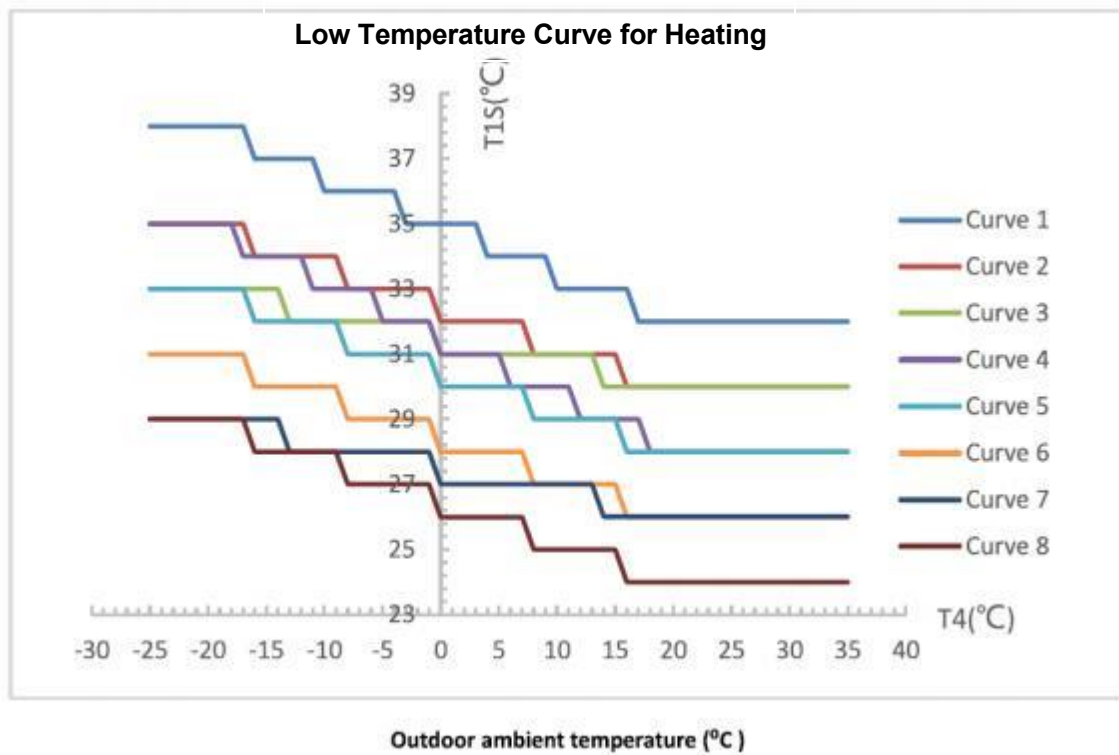


Low Temperature Curve for Heating (HL Curve)							
HL1		HL2		HL3		HL4	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 18$	32	$\geq 16$	30	$\geq 14$	30	$\geq 18$	28
$9 \leq T < 18$	33	$8 \leq T < 16$	31	$0 \leq T < 14$	31	$13 \leq T < 18$	29
$4 \leq T < 9$	34	$0 \leq T < 8$	32	$-14 \leq T < 0$	32	$6 \leq T < 8$	30
$-3 \leq T < 4$	35	$-8 \leq T < 0$	33	$< -14$	33	$0 \leq T < 6$	31
$-10 \leq T < -3$	36	$-16 \leq T < -8$	34	/	/	$-5 \leq T < 0$	32
$-16 \leq T < -10$	37	$< -16$	35	/	/	$-9 \leq T < -5$	33
$< -16$	38	/	/	/	/	$-16 \leq T < -9$	34
/	/	/	/	/	/	$< -16$	35

HL5		HL6		HL7		HL8	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 16$	28	$\geq 16$	26	$\geq 14$	26	$\geq 16$	24
$8 \leq T < 16$	29	$8 \leq T < 16$	27	$0 \leq T < 14$	27	$8 \leq T < 16$	25
$0 \leq T < 8$	30	$0 \leq T < 8$	28	$-14 \leq T < 0$	28	$0 \leq T < 8$	26
$-8 \leq T < 0$	31	$-8 \leq T < 0$	29	$< -14$	29	$-8 \leq T < 0$	27
$-16 \leq T < -8$	32	$-16 \leq T < -8$	30	/	/	$-16 \leq T < -8$	28
$< -16$	33	$< -16$	31	/	/	$< -16$	29

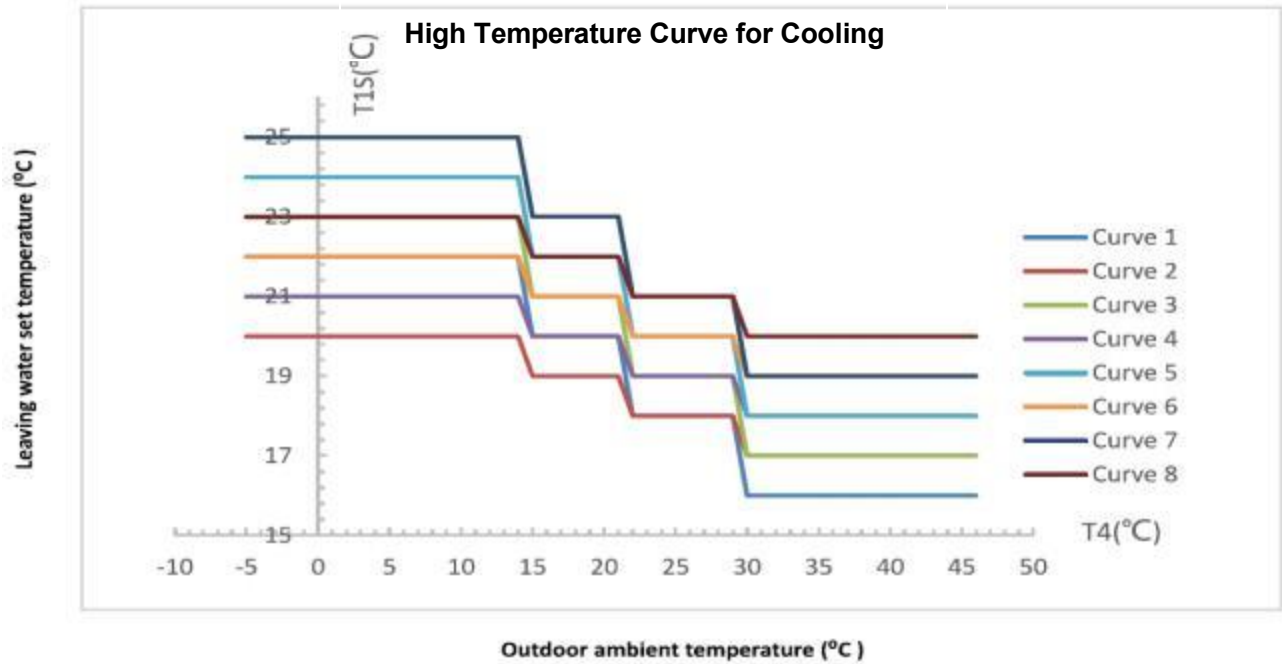
**NOTE:** Curve 4 and Curve 6 are ECO energy saving curves



## 4.1.2 Cooling Curves

High Temperature Curve for Cooling (CH Curve)							
CH1		CH2		CH3		CH4	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 30$	16	$\geq 30$	17	$\geq 30$	17	$\geq 30$	18
$22 \leq T < 30$	18	$22 \leq T < 30$	18	$22 \leq T < 30$	19	$22 \leq T < 30$	19
$16 \leq T < 22$	20	$16 \leq T < 22$	19	$16 \leq T < 22$	21	$16 \leq T < 22$	20
$< 16$	22	$< 16$	20	$< 16$	23	$< 16$	21
CH5		CH6		CH7		CH8	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 30$	18	$\geq 30$	19	$\geq 30$	19	$\geq 30$	20
$22 \leq T < 30$	20	$22 \leq T < 30$	20	$22 \leq T < 30$	21	$22 \leq T < 30$	21
$16 \leq T < 22$	22	$16 \leq T < 22$	21	$16 \leq T < 22$	23	$16 \leq T < 22$	22
$< 16$	24	$< 16$	22	$< 16$	25	$< 16$	23

**NOTE:** Curve 4 and Curve 6 are ECO energy saving curves

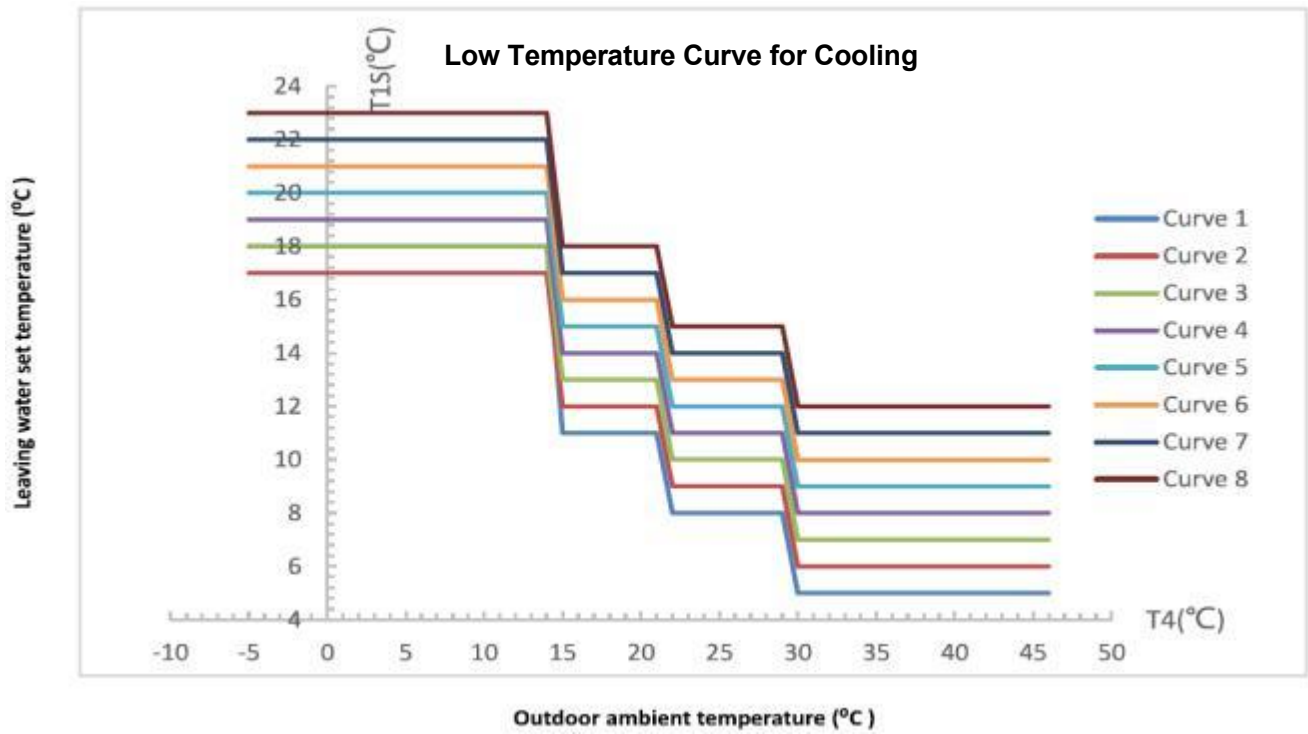


Low Temperature Curve for Cooling (CL Curve)							
CL1		CL2		CL3		CL4	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 30$	5	$\geq 30$	6	$\geq 30$	7	$\geq 30$	8
$20 \leq T < 30$	8	$20 \leq T < 30$	9	$20 \leq T < 30$	10	$20 \leq T < 30$	11
$16 \leq T < 22$	11	$16 \leq T < 22$	12	$16 \leq T < 22$	13	$16 \leq T < 22$	14
$< 16$	17	$< 16$	18	$< 16$	18	$< 16$	19

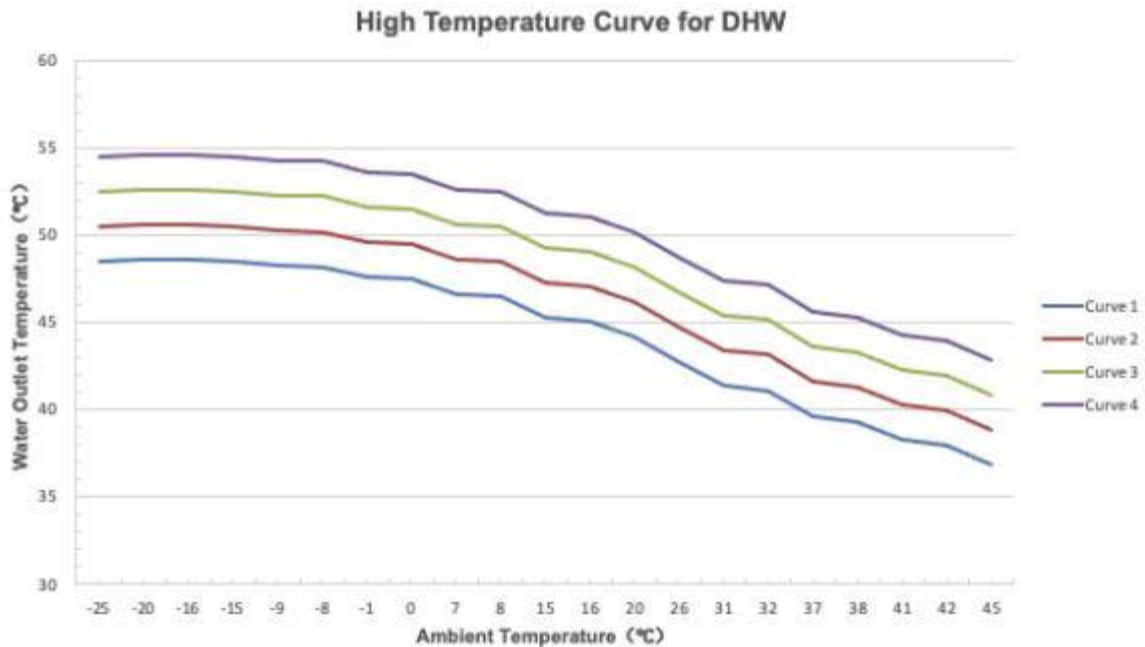
CL5		CL6		CL7		CL8	
Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)	Ambient Temp. (T/C)	Water Outlet Temp. (C)
$\geq 30$	9	$\geq 30$	10	$\geq 30$	11	$\geq 30$	12
$20 \leq T < 30$	12	$20 \leq T < 30$	13	$20 \leq T < 30$	14	$20 \leq T < 30$	15
$16 \leq T < 22$	15	$16 \leq T < 22$	16	$16 \leq T < 22$	17	$16 \leq T < 22$	18
$< 16$	20	$< 16$	21	$< 16$	22	$< 16$	23

**NOTE:** Curve 4 and Curve 6 are ECO energy saving curves



### 4.1.3 DHW Curves

Temperature Curve for DHW (H Curve)				
Ambient Temp.(T/C)	Water Outlet Temp. (C)			
	H1	H2	H3	H4
-25	49	51	53	55
-20	49	51	53	55
-16	49	51	53	55
-15	49	51	53	55
-9	48	50	52	54
-8	48	50	52	54
-1	48	50	52	54
0	48	50	52	54
7	47	49	51	53
8	46	48	50	52
15	45	47	49	51
16	45	47	49	51
20	44	46	48	50
26	43	45	47	49
31	41	43	45	47
32	41	43	45	47
37	40	42	44	46
38	39	41	43	45
41	38	40	42	44
42	38	40	42	44
45	37	39	41	43



## 4.2 Error Code

### 4.2.1 Motherboard

Error Code	Error Description	Troubleshooting
E01	Wrong Phase	Power Supply Connect Wrong Phase
E02	Missing Phase	Power Supply Missing Phase
E03	Water Flow Failure	1.Check whether the circulating water pump is normal and whether the water system is blocked.
		2.Check whether the water flow switch is normal and whether the installation direction is correct.
		3.Check whether the wiring of the water flow switch is correct or not.
		4.Check whether the water pump head meets the actual requirements
		5.Check whether the water pump is reversed and installed in the wrong direction.
E04	Abnormal Communication between Motherboard and Remote Module (Reserved)	Check the communication connection between the motherboard and the remote module
E05	High Pressure Switch Failure	1.Check pressure switch for damage, wiring error
		2.Check if there is too much refrigerant in the system.
		3.Check whether the fan is working properly and whether the water flow of the unit is normal.
		4.Check whether there is air or blockage in the fluorine system.
		5.Check whether the water-side heat exchanger is seriously caked with whitewash.
E06	Low Pressure Switch Failure	1.Check pressure switch for damage, wiring error
		2.Check if there is not enough refrigerant in the system.
		3.Check whether the fan is working properly
		4.Check whether there is air or blockage in the fluorine system.
E09	Wire Controller Communication Failure	Check the communication connection between the wire controller and the main board
E10	Reserve	Reserve

E11	Out of Use Time	The free trial period has expired, enter the boot password
E12	Exhaust Temp. Too High	1. Fluorine system clogging 2. Lack of refrigerant in the fluorine system or bad sensor
E14	Water Tank Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E15	Water Inlet Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E16	Coil Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E18	Exhaust Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E20	Indoor Ambient Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E21	Outdoor Ambient Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E22	DHW Return Water Temp. Sensor Failure	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E23	Water Outlet Temp. Too Low in Cooling Mode	1. Check whether the water flow is too low or no water flow 2. Check if the water outlet sensor is damaged 3. Fluorine system clogging
E24	Antifreeze Temp. Sensor Failure (Fluorine Circuit)	1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E25	Reserve	Reserve
E26	Antifreeze Temp. Sensor Failure (Water Circuit)	1. The sensor wire is loose or damaged 2. Sensor is damaged

<b>Error Code</b>	<b>Error Description</b>	<b>Troubleshooting</b>
		3. The motherboard port is damaged
E27	Water Outlet Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E29	Suction Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E30	Suction Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E31	Water Pressure Failure	1. Water pressure switch wiring error
		2. Water pressure switch failure
E32	Water Outlet Temp. Sensor T15 Failure	1. Water flow is not enough
		2. Sensor failure
E33	High Pressure Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E34	Low Pressure Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E37	Large Temp. Difference between Water Inlet and Outlet	1. The water inlet or outlet sensor is damaged
		2. Water inlet or outlet sensor not placed or in the wrong position
		3. Water flow is not enough
E38	Fan Failure	Fan driver board or motor failure
E42	Cooling Coil Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E44	Ambient Temp. Too Low	Normal protection
E47	Economizer Inlet Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
E48	Economizer Inlet Temp. Sensor	1. The sensor wire is loose or damaged

Error Code	Error Description	Troubleshooting
	Failure	2. Sensor is damaged
		3. The motherboard port is damaged
E49	Economizer Outlet Temp. Sensor Failure	Same as E47
E51	High Pressure Too High	Same as E05
E52	Low Pressure Too Low	Same as E06
E55	Expansion Board Communication Failure	1.Poor contact or broken signal wire
		2.Expansion board damage
		3.Motherboard damage
E80	Power Supply Error	Single-phase power supply unit detects a three-phase electrical signal
E88	Inverter Drive Module Protection	Compressor or compressor driver board is damaged, specific faults see 4.2.2
E94	Built-in pump over/under voltage	1. Input power supply voltage < 165V
		2. Input power supply voltage > 265V
		3. Electronic components on the pump drive board are damaged or damp
		4. Water pump failure
E96	Compressor Drive Board Communication Failure	1.Poor contact or broken signal wire
		2.Electronic components on the motherboard are damaged or damp.
		3.Compressor drive board on the electronic components are damaged or moisture
		4.Compressor drive board power supply is not powered on
E98	Fan Board Communication Failure	1.Poor contact or broken signal wire
		2.Electronic components on the motherboard are damaged or damp.
		3.Fan drive board on the electronic components are damaged or moisture
		4.Fan drive board power supply is not powered on
EA1	Cascade Model Mismatch	Different series of units are not allowed to be cascaded
EA2	Solar Water Heater Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
EA3	Zone 2 Temp. Sensor Failure	1. The sensor wire is loose or damaged



Error Code	Error Description	Troubleshooting
		2. Sensor is damaged
		3. The motherboard port is damaged
EA4	Buffer Tank Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged
EA5	Total Water Outlet Temp. Sensor Failure	1. The sensor wire is loose or damaged
		2. Sensor is damaged
		3. The motherboard port is damaged

#### 4.2.2 Driver Board (Compressor)

Compressor Drive Error Description Table		
E88	P1	IPM Module Overheat and Shutdown
	P2	Compressor Driver Failure
	P3	Compressor Overcurrent
	P4	Input Voltage Missing Phase
	P5	IPM Supply Voltage Failure
	P6	Power Component Overheating and Shutdown
	P7	Pre-charge Circuit Voltage Failure
	P8	DC Bus Overvoltage
	P9	DC Bus Undervoltage
	P10	AC Input Undervoltage
	P11	AC Input Overvoltage
	P12	Input Voltage Sampling Failure
	P13	DSP and PFC Communication Failure
	P14	Board Radiator Temp. Sensor Failure
	P15	DSP and Communicate Board Communication Failure
	P16	Communication Failure with Motherboard
	P17	Compressor Overcurrent Alarm
	P18	Compressor Weak Magnetic Protection Alarm
	P19	IPM Overheat Alarm
	P20	PFC Overheat Alarm
	P21	AC Input Overcurrent Alarm

P22	EEPROM Error Alarm
P23	N/A
P24	EEPROM Refresh Complete
P25	Temperature Sensing Failure Limit
P26	AC Undervoltage Frequency Limit Protection Alarm:
P27	N/A
P28	N/A
P29	N/A
P30	N/A
P31	N/A
P32	N/A
P33	IPM Module Overheat and Shutdown
P34	Compressor Missing Phase
P35	Compressor Overload
P36	Input Current Sampling Failure
P37	IPM Supply Voltage Failure
P38	Pre-charge Circuit Voltage Failure
P39	EEPROM Failure
P40	AC Input Overvoltage Failure
P41	Microelectronics Failure
P42	Compressor Type Code Failure
P43	Current Sampling Signal Overcurrent
Wire controller blinks to cycle through E88 and above codes	

## 4.3 Parameter & Explanation

### 4.3.1 Running Parameter

No.	Description	Setting Range	No.	Description	Setting Range
1	Compressor Running Frequency	0~150Hz	31	System 2 Compressor Running Frequency	
2	Fan Running Speed	0~999Hz	32	System 2 Fan Running Speed	
3	EEV Open Step	0~480P	33	System 2 EEV Open Step	
4	EVI Valve Open Step	0~480P	34	System 2 EVI Valve Open Step	
5	AC Input Voltage	0~500V	35	System 2 AC Input Voltage	
6	AC Input Current	0~50.0A	36	System 2 AC Input Current	
7	Compressor Phase Current	0~50.0A	37	System 2 Compressor Phase Current	
8	Compressor IPM Temp.	-40~140C	38	System 2 Compressor IPM Temp.	
9	High Pressure Saturation Temp.	-50~200C	39	System 2 High Pressure Saturation Temp.	

No.	Description	Setting Range	No.	Description	Setting Range
10	Low Pressure Saturation Temp.	-50~200C	40	System 2 Low Pressure Saturation Temp.	
11	Ambient Temp. T1	-40~140C	41	System 2 Outer Coil Temp.	
12	Outer Coil Temp. T2	-40~140C	42	System 2 Inner Coil Temp.	
13	Inner Coil Temp. T3	-40~140C	43	System 2 Suction Temp.	
14	Suction Temp. T4	-40~140C	44	System 2 Exhaust Temp.	
15	Exhaust Temp. T5	0~150C	45	System 2 Economizer Inlet Temp.	
16	Water Inlet Temp. T6	-40~140C	46	System 2 Economizer Outlet Temp.	
17	Water Outlet Temp. T7	-40~140C	47	Reserve	
18	Economizer Inlet Temp. T8	-40~140C	48	Reserve	
19	Economizer Outlet Temp. T9	-40~140C	49	Reserve	
20	Current Unit Tool Number	0~120	50	Reserve	
21	DHW Tank Temp.	-40~140C	51	Solar Water Heater Temp.	
22	Plate Heat Exchanger Exhaust Temp.	-40~140C	52	Zone 2 Temp.	
23	Driver Manufacturer	0~10	53	Butter Tank Temp.	
24	Water Pump Speed PWM	0~100%	54	Total Water Outlet Temp.	
25	Water Flow	3~100L/min	55	Unit B Phase Input Voltage	
26	DHW Return Water Temp.	-40~140C	56	Unit B Phase Input Current	
27	Unit Input Voltage	0-500V	57	Unit C Phase Input Voltage	
28	Unit Input Current	0.00A-99.99A	58	Unit C Phase Input Current	
29	Unit Input Power	0.00-99.99KW	59	Smart Grid Status	
30	Unit Power Consumption	0-9999Kw.h	60	Zone 2 Mixing Valve Opening	

#### 4.3.2 Factory Parameter

No.	Description	Default Value	Setting Range	Note
L12	Sterilization	0	0~2	
L13	Days between Sterilizations	7	5~30	
L14	Sterilization Start-up Time	23:00	00:00-24:00	
L15	Sterilization Running Time	10	0-50Min	
L16	Sterilization Temp Setting	70C	50-80C	
L22	DHW return water Setting	0	0~3	0-Disable / 1-Continuous return / 2-Cycle return / 3-Temperature
L23	Return Water Temp Setting	40C	20~65C	
L24	Return Water Return Temp Differential	5C	1~15C	
L25	Return Water Interval Period	30min	3~90min	
L26	Return Water Running Period	5min	1~30min	
P22	Ambient temperature value-Unit no starting	-15	-15~40	If Ambient Temp. ≤P22 then enter defrost

No.	Description	Default Value	Setting Range	Note
P24	Ambient temperature value- Allow electric heater to start	0	-10 ~ 10C	
P25	Overprotection value- Inlet and outlet water temperature differential	0	-10 ~ 10C	
P26	Compensation value-Return water temperature	5	0 ~ 10C	
P27	Floor heating return differential value	5	0 ~ 10C	
P28	Water Pump Control-Unit shutdown when reaching temperature	0	0 ~ 1	0-Running /1-Stop /2-Running in cooling mode /3-Running in cooling/heating mode /4-Running in underfloor heating mode
P29	Anti-freeze-water pump running time	2	0 ~ 10 min	
P30	Defrost mode selection	0	0 ~ 2	0-Intelligent control /1-Timing control/ 2-Rapid control /3-Dew point control
P31	Defrosting - cumulative runtime	45	0 ~ 120	
P32	Defrosting - coil temperature value	-5	-30 ~ 0	
P33	Defrosting - temperature differential 1	9	0 ~ 20	
P34	Defrosting - temperature differential 2	7	0 ~ 20	
P35	Maximum defrosting time	10	0 ~ 30	
P36	Exit defrosting - coil temperature	12	0 ~ 30	
P37	Shutdown mode - Reaching target temperature	0	0 ~ 2	0-Intelligent shutdown/1- Temperature shutdown /2- Cooling intelligent
P38	Opening degree constant - Heating main valve	300	-999 ~ 999	
P48	Enable/Disable Hot Water Tank temperature sensor	0	0 ~ 1	0-Disable/1-Enable
P88	Silent mode - compressor maximum frequency	50	20-70Hz	
P89	Silent mode - fan motor maximum frequency	40	20-60Hz	
P95	Cascade - water pump operation mode	0	0-1	0-Together control /1- Independent control
P96	DHW differential value	5	0 ~ 10C	
P97	Water tank temperature automatic compensation	0	0 ~ 1	0-Enable/1-Disable
P98	Water tank temperature manual compensation	0	-10 ~ 10C	
P99	Water pump speed regulation temperature differential	5	2 ~ 10C	

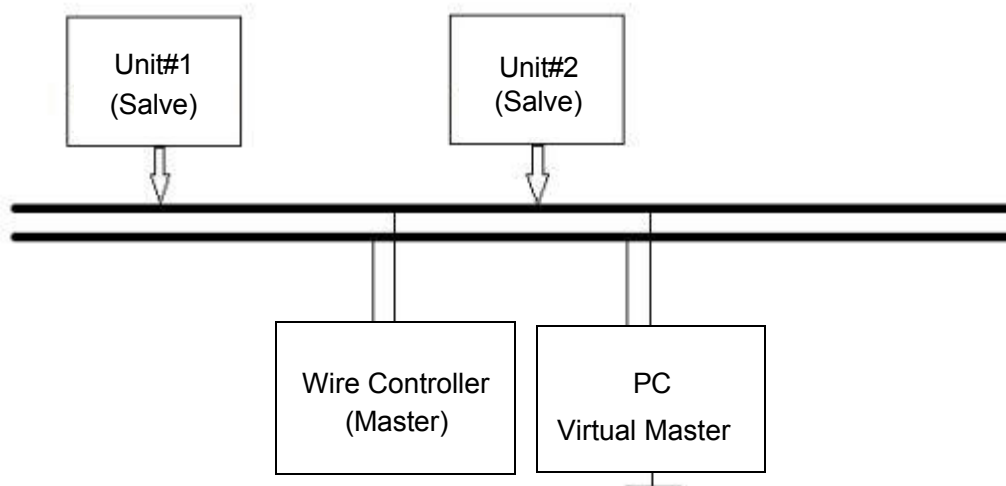
No.	Description	Default Value	Setting Range	Note
P100	PWM pump minimum speed	50	20~80%	Percentage of RPM
P101	Unit water pump control mode (Master)	1	0~1	0-ON/OFF /1-PMW
P115	Unit type selection	1	0~5	0-2-unit /1-3-unit
P116	Unit temperature control mode	0	0~1	0-Water Inlet Temp./1-Water Outlet Temp.
P117	Ambient temperature - Allow access to anti-freeze	5	0~10℃	
P118	Outlet water temperature - Allow access to anti-freeze	3	0~20℃	
P119	Refrigerant type	2	0~20	1-R410A/2-R32/3-R290
P139	Buffer tank electric heating	0	0/1	0-Enable/1-Disable
P140	DHW electric heating			0-Enable/1-Disable
P150	Water pump - secondary heating/cooling system	0/1/2/3	2	
P151	Return differential - Hot water heat source	0-40	0	
P152	Return differential - Heating heat source	0-40	0	
P153	Upper temperature limit - Hot water heat source combined temperature	15-80	70	
P154	Upper temperature limit - Heating water heat source combined temperature	15-80	60	
P161	Auxiliary pump selection	0/1/2/3/4	0	0-DHW/1-Cooling/2-Underfloor heating/3-Heating&Cooling/4-Above all
P162	Anti-freezing interval - Hot water pipes	0~360	90	If set to 0, mean disable
P163	Water pump speed regulation - Minimum speed	0~70	30	L/min
P164	Level control	0/3	3	0-Enable/3-Disable
P165	Load return differential	1~15℃	3	
P166	Lightening back to the poor	1~15℃	2	
P167	Stop back to the poor	1~15℃	3	
P168	Hot water mode start ratio	1~100%	50	
P169	Non-hot water mode start ratio	1~100%	100	
P170	Loading cycle	3~60min	7	
P179	Target frequency - Power mode	0~40Hz	15	
P180	Target frequency upper limit- Power mode	0~40Hz	5	
P181	Defrost selection - Evaporate side	0~2	0	0-Current/1-Heating/2-DHW
P182	Pipe electric heating option	0~2		0-3kW+6kW/ 1- 3kW/ 2-6kW/ 3- Disabled
P255	Smart Grid Options - On/Off	0~1		

No.	Description	Default Value	Setting Range	Note
P256	Smart Grid Options - Peak grid running time	30~999		
P257	Dual temperature zone selection	0~2		
P258	Mixed water regulating valve cycle	5~20		
P259	Mixing valve full cycle time	0~180		
P260	Maximum water pump speed	50~99	99	%
P261	Water pump speed - at constant temperature	20~99	30	%

## 4.4 Communication Protocols

### 4.4.1 Communication Way

The wire controller, PC and external unit are connected by RS485 bus, the wire controller, PC is the communication master, and the external unit is the communication slave, the communication topology is as follows.



Address convention: range 1-255

Address 0: broadcast address, use broadcast command to send data, all units receive data but do not reply.

### 4.4.2 Communication Sequence

This communication adopts master-slave answering half-duplex asynchronous serial communication mode, and the external machine works in the slave state. After the slave receives the command from the host, it waits for 100ms after the end of communication for the next transmission, and each time the access address is not more than 100; since the PC and the line controller are the same as the host, the communication time must be staggered, and it can be used to take turns to send.

### 4.4.3 Communication Address

1. Communication using RS485 bus, asynchronous serial signal 1 start bit, 8 data bits, 1 end bit, no parity, baud rate 9600.
2. In line with the standard MODBUS RTU protocol, 16-bit data structure, 16-bit CRC checksum, low byte in front of the high byte in the back.
3. The state temperature and set temperature all X10 processing, such as 255, representing 25.5



4. There are three commands used for master-slave communication:

4.1. Command 03H (query 1 or more registers)

Send command: [device address] + [command number 03H] + [start register address high 8 bits] + [low 8 bits] + [read the number of registers high 8 bits] + [low 8 bits] + [low 8 bits] + [low 8 bits of the CRC checksum] + [high 8 bits of the CRC checksum]

Device response: [Device address] + [Command number 03H] + [Number of bytes returned] + [Data 1 high 8 bits] + [Data 1 high low bits] +... + [Data n] + [Lower 8 bits of CRC checksum] + [Higher 8 bits of CRC checksum]

4.2. Command 06H (Modify single register)

Send Command: [Device Address] + [Command No. 06H] + [Register address to be lowered high 8 bits] + [low 8 bits] + [Data to be lowered high 8 bits] + [low 8 bits] + [Low 8 bits] + [Low 8 bits of CRC check] + [High 8 bits of CRC check]

Device response: if successful, return the command sent by the computer as it is, otherwise, do not respond.

4.3. Command 10H (modify multiple registers)

Send command: [device address] + [command number 10H] + [start register address high 8 bits] + [low 8 bits] + [number of registers high 8 bits] + [low 8 bits] + [number of register bytes] + [data 1 high 8 bits] + [low 8 bits] + .... + [Data N high 8 bits] + [low 8 bits] + [low 8 bits of CRC checksum] + [high 8 bits of CRC checksum]

Device response: [Device address] + [Command number 10H] + [Start register address high 8 bits] + [Low 8 bits] + [Number of registers high 8 bits] + [Low 8 bits] + [Low 8 bits] + [Low 8 bits of CRC check] + [High 8 bits of CRC check].

4.4. Command 01H (Query 1 or more coils) (valid for communication protocol  $\geq 130$ )

Send command: [Device address] + [Command No. 01H] + [Start coil address high 8 bits] + [Low 8 bits] + [Read coil number high 8 bits] + [Low 8 bits] + [Low 8 bits] + [Low 8 bits of CRC check] + [High 8 bits of CRC check]

Device response: [Device address] + [Command number 01H] + [Number of bytes returned] + [Data 1] + [Data 2] + ... + [Data n] + [Lower 8 bits of CRC checksum] + [Higher 8 bits of CRC checksum]

Note: A single data contains the values of 8 coils.

4.5. Command 05H (Modify single coil) (valid for communication protocol  $\geq 130$ )

Send command: [Device address] + [Command No. 05H] + [High 8 bits of coil address to be placed] + [Low 8 bits] + [High 8 bits of data to be placed] + [Low 8 bits] + [Low 8 bits] + [Low 8 bits of CRC check] + [High 8 bits of CRC check]

Device response: if successful return the command sent by the computer as is, otherwise no response

Note: If the lower data is zero, the coil is set to zero; if the lower data is not zero, the coil is set to one;

4.6. Sending other commands is invalid, and does not respond to the data

No.	Name	Address Ranges	Read-Write	Note
1	Real-time status and faults	0x0000~0x003F	R	64Bit
2	Real-time data	0x0040~0x00FF	R	192Bit
3	System Parameters P	0x0100~0x02FF	RW	512Bit
4	User Parameters	0x0300~0x032F	RW	48Bit
5	User Commands	0x0330~0x035F	RW	48Bit
6	Version Information	0x0360~0x036F	R	16Bit
7	System Parameters L	0x0800~0x083F	RW	64Bit
8	Bit operation commands	0x1000~0x10FF	RW	256Bit

**1. Real-time data 0x0000~0x03F**

**Includes: Data on switch ports, relays, dip switches, faults, etc.**

Address	Name	Address Ranges	Default Value	Read-Write	Note
0x0000	Running Status 1	Bit Definitions		R	
0x0001	Running Status 2	Bit Definitions		R	
0x0002	Error Status 1	Bit Definitions		R	
0x0003	Error Status 2	Bit Definitions		R	
0x0004	Error Status 3	Bit Definitions		R	
0x0005	System 1 Error Status 1	Bit Definitions		R	
0x0006	System 1 Error Status 2	Bit Definitions		R	
0x0007	System 1 Driver Error Status 1	Bit Definitions		R	
0x0008	System 1 Driver Error Status 2	Bit Definitions		R	
0x0009	System 1 Driver Error Status 3	Bit Definitions		R	
0x000A	System 2 Error Status 1	Bit Definitions		R	Refer to 0x0005
0x000B	System 2 Error Status 2	Bit Definitions		R	Refer to 0x0006
0x000C	System 2 Driver Error Status 1	Bit Definitions		R	Refer to 0x0007
0x000D	System 2 Driver Error Status 2	Bit Definitions		R	Refer to 0x0008
0x000E	System 2 Driver Error Status 3	Bit Definitions		R	Refer to 0x0009
0x000F		Bit Definitions		R	Refer to 0x0005
0x0010		Bit Definitions		R	Refer to 0x0006
0x0011		Bit Definitions		R	Refer to 0x0007
0x0012		Bit Definitions		R	Refer to 0x0008
0x0013		Bit Definitions		R	Refer to 0x0009
0x0014		Bit Definitions		R	Refer to 0x0005
0x0015		Bit Definitions		R	Refer to 0x0006
0x0016		Bit Definitions		R	Refer to 0x0007
0x0017		Bit Definitions		R	Refer to 0x0008
0x0018		Bit Definitions		R	Refer to 0x0009
0x0019	Relay Output Status 1	Bit Definitions		R	
0x001A	Relay Output Status 2	Bit Definitions		R	
0x001B	Relay Output Status 3	Bit Definitions		R	
0x001C	Relay Output Status 4	Bit Definitions		R	
0x001D	Switch Port Status 1	Bit Definitions		R	
0x001E	Switch Port Status 2	Bit Definitions		R	
0x001F	Switch Port Status 3	Bit Definitions		R	
0x0020	Switch Port Status 4	Bit Definitions		R	
0x0021		Real Value		R	
0x0022		Real Value		R	
0x0023		Real Value		R	
0x0024	Current Unit Tool Number	Real Value		R	
0x0025		Real Value		R	
0x0026		Real Value		R	
0x0027	Compressor Frequency 1Target	Real Value		R	
0x0028	Compressor Frequency 2 Target	Real Value		R	
.....				R	
0x003F	Reserve				

**2. Real-time data 0x0040~0x00FF**

**Includes: temperature, voltage, pressure, expansion valve opening and other data**

Address	Name	Address Ranges	Default Value	Read-Write	Note
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0x0040	Compressor Running Frequency	Real Value	Real Value	R	
0x0041	Fan Running Speed	Real Value	Real Value	R	
0x0042	EEV Open Step	Real Value	Real Value	R	
0x0043	EVI Valve Open Step	Real Value	Real Value	R	
0x0044	AC Input Voltage	Real Value	Real Value	R	
0x0045	AC Input Current	Real Value	Real Value	R	Display Value = Real Value/10
0x0046	Compressor Phase Current	Real Value	Real Value	R	Display Value = Real Value/10
0x0047	Compressor IPM Temp.	Real Value	Real Value	R	
0x0048	High Pressure Saturation Temp.	Real Value	Real Value	R	
0x0049	Low Pressure Saturation Temp.	Real Value	Real Value	R	
0x004A	Ambient Temp. T1	Real Value	Real Value	R	
0x004B	Outer Coil Temp. T2	Real Value	Real Value	R	
0x004C	Inner Coil Temp. T3	Real Value	Real Value	R	
0x004D	Suction Temp. T4	Real Value	Real Value	R	
0x004E	Exhaust Temp. T5	Real Value	Real Value	R	
0x004F	Water Inlet Temp. T6	Real Value	Real Value	R	
0x0050	Water Outlet Temp. T7	Real Value	Real Value	R	
0x0051	Economizer Inlet Temp. T8	Real Value	Real Value	R	
0x0052	Economizer Outlet Temp. T9	Real Value	Real Value	R	
0x0053	Current Unit Tool Number	Real Value	Real Value	R	
0x0054	DHW Tank Temp.	Real Value	Real Value	R	
0x0055	Plate Heat Exchanger Exhaust Temp.	Real Value	Real Value	R	
0x0056	Driver Manufacturer	Real Value	Real Value	R	
0x0057	Water Pump Speed PWM	Real Value	Real Value	R	
0x0058	Water Flow	Real Value	Real Value	R	
0x0059	DHW Return Water Temp.	Real Value	Real Value	R	
0x005A	Unit Input Voltage	Real Value	Real Value	R	
0x005B	Unit Input Current	Real Value	Real Value	R	Display Value = Real Value/100
0x005C	Unit Input Power / kw	Real Value	Real Value	R	Display Value = Real Value/100
0x005D	Unit Power Consumption / kwh	Real Value	Real Value	R	
0x005E	System 2 Compressor Running Frequency				
0x005F	System 2 Fan Running Speed				
0x0060	System 2 EEV Open Step				
0x0061	System 2 EVI Valve Open Step				
0x0062	System 2 AC Input Voltage				
0x0063	System 2 AC Input Current				Display Value = Real Value/10
0x0064	System 2 Compressor Phase Current				Display Value = Real Value/10
0x0065	System 2 Compressor IPM Temp.				
0x0066	System 2 High Pressure Saturation Temp.				
0x0067	System 2 Low Pressure Saturation Temp.				
0x0068	System 2 Outer Coil Temp.				
0x0069	System 2 Inner Coil Temp.				
0x006A	System 2 Suction Temp.				
0x006B	System 2 Exhaust Temp.				
0x006C	System 2 Economizer Inlet Temp.				
0x006D	System 2 Economizer Outlet Temp.				
0x0072	Solar Water Heater Temp.	Real Value	Real Value	R	

0x0073	Zone 2 Temp.	Real Value	Real Value	R	
0x0074	Butter Tank Temp.	Real Value	Real Value	R	
0x0075	Total Water Outlet Temp.	Real Value	Real Value	R	
0x0076	Unit B Phase Input Voltage	Real Value	Real Value	R	
0x0077	Unit B Phase Input Current	Real Value	Real Value	R	显示=实测/100
0x0078	Unit C Phase Input Voltage	Real Value	Real Value	R	
0x0079	Unit C Phase Input Current	Real Value	Real Value	R	显示=实测/100
0x007A	Smart Grid Status	Real Value	Real Value	R	
0x007B	Zone 2 Mixing Valve Opening	Real Value	Real Value	R	
0x007C	Zone 1 Mixing Temp.	Real Value	Real Value	R	
0x007D	Zone 1 Mixing Valve Opening	Real Value	Real Value	R	
0x00F0					
0x00F1					
0x00F2					
0x00F3					
0x00F4					
0x00F5					
0x00F6					
0x00F7					
0x00F8					
0x00F9					
0x00FA	Upper Limit of underfloor heating/heating Set Temp.	Real Value	Real Value	R	
0x00FB	Lower Limit of underfloor heating/heating Set Temp.	Real Value	Real Value	R	
0x00FC	Upper Limit of DHW Set Temp.	Real Value	Real Value	R	
0x00FD	Upper Limit of DHW Set Temp.	Real Value	Real Value	R	
0x00FE	Upper Limit of Cooling Set Temp.	Real Value	Real Value	R	
0x00FF	Upper Limit of Cooling Set Temp.	Real Value	Real Value	R	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>Running Status 1</b> (1: Enable) (0: Disable)	Bit0	Refrigerant Recovery	<b>Running Status 2</b> (1: Enable) (0: Disable)	Bit0	Sterilization
	Bit1	Primary Anti-freeze		Bit1	Sterilization and Insulation
	Bit2	Secondary Anti-freeze		Bit2	
	Bit3	Fault Alarm		Bit3	
	Bit4	System oil return		Bit4	
	Bit5			Bit5	
	Bit6			Bit6	
	Bit7			Bit7	
	Bit8	System Frosting		Bit8	
	Bit9			Bit9	
	Bit10			Bit10	Wire Controller Control on/off
	Bit11			Bit11	
	Bit12	Shutdown after Reaching Temp.		Bit12	
	Bit13	Shutdown after Unit Failure		Bit13	
	Bit14	Unit Operation		Bit14	
	Bit15	Unit Waiting for Operation		Bit15	

Name	Bit	Status Valve	Name	Bit	Status Valve
Error Status 1 0x0002 (1: Error Enable) (0: Error Disable)	Bit0	Wrong Phase	Error Status 2	Bit0	Ambient Temp. Too Low
	Bit1	Missing Phase		Bit1	
	Bit2	Water Flow Failure		Bit2	
	Bit3	Communication Failure		Bit3	
	Bit4	Emergency Failure		Bit4	
	Bit5	Out of Use Time		Bit5	
	Bit6	Water Tank Temp. Sensor Failure		Bit6	Indoor Ambient Humidity Failure
	Bit7	Water Inlet Temp. Sensor Failure		Bit7	
	Bit8	Indoor Ambient Temp. Sensor Failure		Bit8	
	Bit9	Outdoor Ambient Temp. Sensor Failure		Bit9	
	Bit10	DHW Return Water Temp. Sensor Failure		Bit10	
	Bit11	Water Outlet Temp. Too Low in Cooling Mode		Bit11	Phase Sequence Dip Switch Error
	Bit12	Water Level Switch Failure		Bit12	
	Bit13	Water Outlet Temp. Sensor Failure		Bit13	Water Pump 1 Failure
	Bit14	Water Outlet Temp. Too High in Heating Mode		Bit14	Water Pump 2 Failure
Bit15	Large Temp. Difference between Water Inlet and Outlet	Bit15	Low Water Flow		

Name	Bit	Status Valve
Error Status 3	Bit0	Phase Sequence Disconnected
	Bit1	Expansion Board Communication Failure
	Bit2	Plate Heat Exchanger Temp. Sensor Failure
	Bit3	Fan Board 1 Communication Failure
	Bit4	Fan Board 2 Communication Failure
	Bit5	Cascade Model Mismatch
	Bit6	Solar Water Heater Temp. Sensor Failure
	Bit7	AHS Temp. Sensor Failure
	Bit8	Buffer Tank Temp. Sensor Failure
	Bit9	Total Water Outlet Temp. Sensor Failure
	Bit10	Reserve
	Bit11	Reserve
	Bit12	Zone 1 Temp. Sensor Failure
	Bit13	Reserve
	Bit14	Reserve
Bit15	Reserve	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>System 1</b> Error Status 1	Bit0	High Pressure Switch Failure	<b>System 1</b> Error Status 2	Bit0	High Pressure Sensor Failure
	Bit1	Low Pressure Switch Failure		Bit1	Low Pressure Sensor Failure
	Bit2	High Pressure Too High		Bit2	Middle Pressure Switch Failure
	Bit3	High Pressure Too Low		Bit3	Coil Temp. Too High
	Bit4	Exhaust Pressure Too High		Bit4	Compressor Drive Board Communication Failure
	Bit5	Current Protection		Bit5	
	Bit6	Coil Pressure Too High		Bit6	
	Bit7	Coil Temp. Sensor Failure		Bit7	
	Bit8	Suction Temp. Sensor Failure		Bit8	
	Bit9	Exhaust Temp. Sensor Failure		Bit9	
	Bit10	Economizer Inlet Temp. Sensor Failure		Bit10	
	Bit11	Economizer Outlet Temp. Sensor Failure		Bit11	
	Bit12	Fan Drive Board Communication Failure		Bit12	
	Bit13	Fan Failure		Bit13	
	Bit14	Cooling Coil Temp. Sensor Failure		Bit14	
Bit15	Reserve	Bit15			

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>System 1</b> Driver Board Error Status 1	Bit0	IPM Overcurrent/IPM Module Protection	<b>System 1</b> Driver Board Error Status 2	Bit0	Compressor Overcurrent Alarm
	Bit1	Compressor Driver Failure		Bit1	Compressor Weak Magnetic Protection Alarm
	Bit2	Compressor Overcurrent		Bit2	PIM Overheat Alarm
	Bit3	Input Voltage Missing Phase		Bit3	PFC Overheat Alarm
	Bit4	IPM Current Sampling Failure		Bit4	AC Input Overcurrent Alarm
	Bit5	Power Component Overheating and Shutdown		Bit5	EEPROM Error Alarm
	Bit6	Pre-charge Failure		Bit6	N/A
	Bit7	DC Bus Overvoltage		Bit7	EEPROM Complete Refresh
	Bit8	DC Bus Undervoltage		Bit8	Temperature Sensing Failure Limit
	Bit9	AC Input Undervoltage		Bit9	AC Undervoltage Frequency Limit Protection Alarm;
	Bit10	AC Input Overvoltage		Bit10	N/A
	Bit11	Input Voltage Sampling Failure		Bit11	N/A

	Bit12	DSP and PFC Communication Failure		Bit12	N/A
	Bit13	Board Radiator Temp. Sensor Failure		Bit13	N/A
	Bit14	DSP and Communicate Board Communication Failure		Bit14	N/A
	Bit15	Communication Failure with Motherboard		Bit15	N/A

Name	Bit	Status Valve
<b>System 1</b> Driver Board Error Status 3	Bit0	IPM Module Overheat and Shutdown
	Bit1	Compressor Missing Phase
	Bit2	Compressor Overload
	Bit3	Input Current Sampling Failure
	Bit4	PIM Supply Voltage Failure
	Bit5	Pre-charge Circuit Voltage Failure
	Bit6	EEPROM Failure
	Bit7	AC Input Overvoltage Failure
	Bit8	Microelectronics Failure
	Bit9	Compressor Type Code Failure
	Bit10	Current Sampling Signal Overcurrent
	Bit11	N/A
	Bit12	N/A
	Bit13	N/A
	Bit14	N/A
Bit15	N/A	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>System 2</b> Error Status 1	Bit0	High Pressure Switch 2 Failure	<b>System 2</b> Error Status 2	Bit0	High Pressure Sensor 2 Failure
	Bit1	Low Pressure Switch 2 Failure		Bit1	Low Pressure Sensor 2 Failure
	Bit2	High Pressure 2 Too High		Bit2	Middle Pressure Switch 2 Failure
	Bit3	High Pressure 2 Too Low		Bit3	Coil Temp. 2 Too High
	Bit4	Exhaust Pressure 2 Too High		Bit4	Compressor Drive Board 2 Communication Failure
	Bit5	Current 2 Protection		Bit5	
	Bit6	Coil 2 Pressure Too High		Bit6	
	Bit7	Coil 2 Temp. Sensor Failure		Bit7	
	Bit8	Suction 2 Temp. Sensor Failure		Bit8	
	Bit9	Exhaust 2 Temp. Sensor Failure		Bit9	

	Bit10	Economizer 2 Inlet Temp. Sensor Failure			Bit10	
	Bit11	Economizer 2 Outlet Temp. Sensor Failure			Bit11	
	Bit12	Fan Drive 2 Board Communication Failure			Bit12	
	Bit13	Fan 2 Failure			Bit13	
	Bit14	Cooling 2 Coil Temp. Sensor Failure			Bit14	
	Bit15	Reserve			Bit15	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>System 2</b> Driver Board Error Status 1	Bit0	IPM Overcurrent/IPM Module Protection	<b>System 2</b> Driver Board Error Status 2	Bit0	Compressor Overcurrent Alarm
	Bit1	Compressor Driver Failure		Bit1	Compressor Weak Magnetic Protection Alarm
	Bit2	Compressor Overcurrent		Bit2	PIM Overheat Alarm
	Bit3	Input Voltage Missing Phase		Bit3	PFC Overheat Alarm
	Bit4	IPM Current Sampling Failure		Bit4	AC Input Overcurrent Alarm
	Bit5	Power Component Overheating and Shutdown		Bit5	EEPROM Error Alarm
	Bit6	Pre-charge Failure		Bit6	N/A
	Bit7	DC Bus Overvoltage		Bit7	EEPROM Refresh Complete
	Bit8	DC Bus Undervoltage		Bit8	Temperature Sensing Failure Limit
	Bit9	AC Input Undervoltage		Bit9	AC Undervoltage Frequency Limit Protection Alarm;
	Bit10	AC Input Overvoltage		Bit10	N/A
	Bit11	Input Voltage Sampling Failure		Bit11	N/A
	Bit12	DSP and PFC Communication Failure		Bit12	N/A
	Bit13	Board Radiator Temp. Sensor Failure		Bit13	N/A
	Bit14	DSP and Communicate Board Communication Failure		Bit14	N/A
Bit15	Communication Failure with Motherboard	Bit15	N/A		



Name	Bit	Status Valve
<b>System 2</b> Driver Board Error Status 3	Bit0	IPM Module Overheat and Shutdown
	Bit1	Compressor Missing Phase
	Bit2	Compressor Overload
	Bit3	Input Current Sampling Failure
	Bit4	PIM Supply Voltage Failure
	Bit5	Pre-charge Circuit Voltage Failure
	Bit6	EEPROM Failure
	Bit7	AC Input Overvoltage Failure
	Bit8	Microelectronics Failure
	Bit9	Compressor Type Code Failure
	Bit10	Current Sampling Signal Overcurrent
	Bit11	N/A
	Bit12	N/A
	Bit13	N/A
	Bit14	N/A
Bit15	N/A	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>System 2</b> Driver Board Error Status 1	Bit0	IPM Overcurrent/IPM Module Protection	<b>System 2</b> Driver Board Error Status 2	Bit0	Compressor Overcurrent Alarm
	Bit1	Compressor Driver Failure		Bit1	Compressor Weak Magnetic Protection Alarm
	Bit2	Compressor Overcurrent		Bit2	PIM Overheat Alarm
	Bit3	Input Voltage Missing Phase		Bit3	PFC Overheat Alarm
	Bit4	IPM Current Sampling Failure		Bit4	AC Input Overcurrent Alarm
	Bit5	Power Component Overheating and Shutdown		Bit5	EEPROM Error Alarm
	Bit6	Pre-charge Failure		Bit6	N/A
	Bit7	DC Bus Overvoltage		Bit7	EEPROM Refresh Complete
	Bit8	DC Bus Undervoltage		Bit8	Temperature Sensing Failure Limit
	Bit9	AC Input Undervoltage		Bit9	AC Undervoltage Frequency Limit Protection Alarm;
	Bit10	AC Input Overvoltage		Bit10	N/A
	Bit11	Input Voltage Sampling Failure		Bit11	N/A
	Bit12	DSP and PFC Communication Failure		Bit12	N/A
	Bit13	Board Radiator Temp. Sensor Failure		Bit13	N/A
	Bit14	DSP and Communicate Board Communication Failure		Bit14	N/A
Bit15	Communication Failure with Motherboard	Bit15	N/A		

Name	Bit	Status Valve	Name	Bit	Status Valve
Relay Status 1 0x0019	Bit0	DHW Electric Heater	Relay Status 2 0x001A	Bit0	Compressor 1
	Bit1	Fan High Wind Level		Bit1	Liquid Injection Valve 1
	Bit2			Bit2	EVI EEV 1

<b>(1: Load Enable) (0: Load Disable)</b>	Bit3	Fan Low Wind Level			Bit3	4-Way Valve 1
	Bit4	AC Electric Heater			Bit4	Bypass Valve 1
	Bit5	Underfloor Heating Electric Heater			Bit5	Fan 1
	Bit6	Built-in water pump			Bit6	
	Bit7				Bit7	
	Bit8				Bit8	Secondary heating pumps
	Bit9	Crankshaft Heater			Bit9	
	Bit10	Chassis Heater			Bit10	Compressor 2
	Bit11	Return Water Valve/Pump			Bit11	Liquid Injection Valve 2
	Bit12				Bit12	EVI EEV 2
	Bit13				Bit13	Compressor 2
	Bit14	Heating & Cooling 3-way valve			Bit14	Liquid Injection Valve 2
	Bit15	Underfloor heating 3-way valve			Bit15	

Name	Bit	Status Valve	Name	Bit	Status Valve
Relay Status 3	Bit0		Relay Status 4	Bit0	Pipe electric heater 1
	Bit1			Bit1	Pipe electric heater 2
	Bit2			Bit2	Auxiliary Water Pump
	Bit3			Bit3	Zone 2 Water Pump
	Bit4			Bit4	Zone 1 Water Pump
	Bit5			Bit5	
	Bit6	Expansion tank electric heater		Bit6	
	Bit7	Hot water heat source water pump		Bit7	
	Bit8	Heating heat source water pumps		Bit8	
	Bit9	AHS Signal output		Bit9	
	Bit10			Bit10	
	Bit11			Bit11	
	Bit12			Bit12	
	Bit13			Bit13	
	Bit14			Bit14	
Bit15		Bit15			

Name	Bit	Status Valve	Name	Bit	Status Valve
Switch Status 1 (1: Closed) (0: Opened)	Bit0	SW1	Switch Status 2	Bit0	
	Bit1	SW2		Bit1	
	Bit2	SW3		Bit2	
	Bit3	SW4		Bit3	
	Bit4	SW5		Bit4	
	Bit5	SW6		Bit5	
	Bit6	SW7		Bit6	
	Bit7	SW8		Bit7	High Pressure Switch 1
	Bit8	Water Flow Switch		Bit8	Low Pressure Switch 1

	Bit9				Bit9	Middle Pressure Switch 1
	Bit10	Linkage Switch (Room Thermostat)			Bit10	High Pressure Switch 2
	Bit11	Linkage Switch (DHW AHS)			Bit11	Low Pressure Switch 2
	Bit12	Linkage Switch			Bit12	Middle Pressure Switch 2
	Bit13	Emergency Switch			Bit13	
	Bit14				Bit14	
	Bit15				Bit15	

Name	Bit	Status Valve	Name	Bit	Status Valve
<b>Switch Status 3</b>	Bit0		<b>Switch Status 4</b>	Bit0	
	Bit1			Bit1	
	Bit2			Bit2	
	Bit3			Bit3	
	Bit4			Bit4	
	Bit5	Linkage Switch (Buffer Tank AHS)		Bit5	
	Bit6			Bit6	
	Bit7			Bit7	
	Bit8			Bit8	
	Bit9			Bit9	
	Bit10			Bit10	
	Bit11			Bit11	
	Bit12			Bit12	
	Bit13			Bit13	
	Bit14			Bit14	
Bit15		Bit15			

<b>3.Factory Parameter 0x0200~0x03FF</b>				
Adress	Name	Address Ranges	Default Value	Read-Write
0x0100	T1 Ambient Temperature Sensor	0~10	RW	0-Enable/1-Diasble
0x0101	High pressure switch setting	0~10	RW	0-Enable/1-Diasble
0x0102	Low pressure switch setting	0~10	RW	0-Enable/1-Diasble
0x0103	Water flow switch setting	0~10	RW	0-Enable/1-Diasble
0x0104	Thermal overload protection switches setting	0~10	RW	0-Enable/1-Diasble
0x0105	Linkage switch setting	0~10	RW	0-Enable/1-Diasble /2-Thermostat 3-Heating thermostat
0x0106	Fan motor type setting	0~10	RW	0-Enable/1-Diasble
0x0107	High pressure protection lockout setting	0~10	RW	0-Enable/1-Diasble
0x0108	Low pressure protection lockout setting	0~10	RW	0-Enable/1-Diasble
0x0109	Exhaust protection lockout setting	0~10	RW	0-Enable/1-Diasble
0x010A	Water flow switch protection lockout setting	0~10	RW	0-Enable/1-Diasble
0x010B	High pressure protection value	40~150	RW	C

0x010C	High pressure frequency limit value	40~150	RW	C
0x010D	Low pressure protection value	-50~-10	RW	C
0x010E	Low pressure frequency limit value	-50~-10	RW	C
0x010F	Exhaust temperature protection value	100~130	RW	C
0x0110	Exhaust temperature frequency limit value	90~120	RW	C
0x0111	Fan speed-up value-Cooling	0~60	RW	C
0x0112	Fan speed-down value-Cooling	0~60	RW	C
0x0113	Fan speed-down value-Heating	0~60	RW	C
0x0114	Fan speed-up value-Heating	0~60	RW	C
0x0115	Ambient temperature value- Unit no starting	-40~-10	RW	C
0x0116	Ambient temperature value- Allow electric heater to start	-15~40	RW	C
0x0117	Overprotection value- Inlet and outlet water temperature differential	10~30	RW	C
0x0118	Compensation value-Return water temperature	-10~10C	RW	C
0x0119	Compensation value-Outlet water temperature	-10~10C	RW	C
0x011A	H&C return differential value	0~10C	RW	C
0x011B	Floor heating return differential value	0~10C	RW	C
0x011C	Water Pump Control-Unit shutdown when reaching temperature	0~10	RW	0-Running /1-Stop /2-Running in cooling mode /3-Running in cooling/heating mode /4-Running in underfloor heating mode
0x011D	Anti-freeze-water pump running time	0~10	RW	min
0x011E	Defrost mode selection	0~10	RW	0-Intelligent control /1-Timing control/ 2-Rapid control /3-Dew point control
0x011F	Defrosting - cumulative runtime	0~120	RW	C
0x0120	Defrosting - coil temperature value	-30~0	RW	C
0x0121	Defrosting - temperature differential 1	0~20	RW	C
0x0122	Defrosting - temperature differential 2	0~20	RW	C
0x0123	Maximum defrosting time	0~30	RW	C
0x0124	Exit defrosting - coil temperature	0~30	RW	C
0x0125	Shutdown mode - Reaching target temperature	0~10	RW	0-Intelligent shutdown/1-Temperature shutdown /2-Cooling intelligent
0x0126	Opening degree constant - Heating main valve	-999~999		
0x0127	Pressure sensor setting	0~10	RW	0-Enable/1-Disable
0x0128	Correction value - Cooling target overheat	-5~10	RW	C
0x0129	Correction value - Heating high voltage protection and frequency limiting	-10~10	RW	C
0x012A	Correction value - Heating target overheat	-5~10	RW	C
0x012B	Medium Pressure Switch Setting	0~10	RW	0-Disable/1-Enable

0x012C	Water flow switch failure detection setting	0~10	RW	0-Enable/1-Disable
0x012D	Communication address code	1~16	RW	
0x012E	Return differential - liquid injection solenoid valve opening	0~15	RW	C
0x012F	EVI target overheat constant	0~12	RW	
0x0130	Enable/Disable Hot Water Tank temperature sensor	0~10	RW	0-Disable/1-Enable
0x0131	Hot water frequency running percentage	30~100	RW	%
0x0132	Cooling - target frequency constants A	-100~100	RW	
0x0133	Cooling - minimum frequency limit	15-60	RW	Hz
0x0134	Cooling - target frequency upper limit	40-120	RW	Hz
0x0135	Cooling - target frequency lower limit	15-120	RW	Hz
0x0136	Heating - target frequency constant B	-100~100	RW	
0x0137	Heating - target frequency upper limit	50-120	RW	Hz
0x0138	Heating - target frequency lower limit	20Hz-120	RW	Hz
0x0139	Heating - minimum frequency1	15-60Hz	RW	Hz
0x013A	Heating - minimum frequency2	15-60Hz	RW	Hz
0x013B	Heating - minimum frequency3	15-60Hz	RW	Hz
0x013C	Hot water - target frequency constants	-100~100	RW	
0x013D	Hot water - target frequency upper limit	50-120	RW	Hz
0x013E	Hot water - target frequency lower limit	15-120	RW	Hz
0x013F	Hot water - minimum frequency 1	15-60	RW	Hz
0x0140	Hot water - minimum frequency 2	15-60	RW	Hz
0x0141	Hot water - minimum frequency 3	15-60	RW	Hz
0x0142	DC fan - initial frequency	20-60	RW	Hz
0x0143	DC fan - heating minimum frequency	20-60	RW	Hz
0x0144	DC fan - heating max frequency	20-80	RW	Hz
0x0145	DC fan - cooling minimum frequency	20-60	RW	Hz
0x0146	DC fan - cooling maximum frequency	20-80	RW	Hz
0x0147	Compressor frequency - Allow auxiliary valve and EVI to open	20-80z	RW	H
0x0148	Compressor frequency - Allow auxiliary valve and EVI to close	20-80	RW	Hz
0x0149	Cooling - main valve initial opening 1	20~480	RW	P
0x014A	Cooling - main valve initial opening 2	20~480	RW	P
0x014B	Cooling - main valve initial opening 3	20~480	RW	P
0x014C	Cooling - main valve minimum opening	0~300	RW	P
0x014D	Heating - main valve minimum opening	0~300	RW	P

0x014E	Main valve - maximum opening	100~500	RW	P
0x014F	Main valve - initial opening constant c	20~300	RW	P
0x0150	Main valve - initial opening coefficient a	-999~999	RW	
0x0151	Main valve - initial opening coefficient b	-999~999	RW	
0x0152	Auxiliary valve - Maximum open degree	100~500	RW	P
0x0153	Auxiliary valve - Minimum open degree	50~300	RW	P
0x0154	Main valve - Adjustment period	10-120	RW	S
0x0155	Auxiliary valve - initial open degree c	-200~900	RW	
0x0156	Auxiliary valve - initial open degree a	-999~999	RW	
0x0157	Auxiliary valve - initial open degree b	-999~999	RW	
0x0158	Silent mode - compressor maximum frequency	20-70	RW	Hz
0x0159	Silent mode - fan motor maximum frequency	20-60Hz	RW	Hz
0x015A	Ambient temperature - Allow auxiliary and EVI to open	0-45	RW	C
0x015B	Interval period - Allow auxiliary and EVI to open	0-30	RW	min
0x015C	Temperature differential(T8-T7) - Allow auxiliary and EVI to open	0-60	RW	C
0x015D	Compressor running time - Allow auxiliary and EVI to open	0-20	RW	min
0x015E	Auxiliary valve adjustment cycle	10-120	RW	S
0x015F	Cascade - water pump operation mode	0-10	RW	0-Together control /1-Independent control
0x0160	DHW differential value	0~10	RW	C
0x0161	Water tank temperature automatic compensation	0~10	RW	0-Enable/1-Diasble
0x0162	Water tank temperature manual compensation	-10~10	RW	C
0x0163	Water pump speed regulation temperature differential	2~10	RW	C
0x0164	PWM pump minimum speed	20~80	RW	%
0x0165	Unit water pump control mode (host)	0~10	RW	0-AC/1-DC
0x0166	Four-way valve control mode	0~10	RW	0-Power on cooling/1- Power on heating
0x0167	Mode switching - unit minimum running time	0~10	RW	min
0x0168	Mode switching - Percentage of operating frequency	20-100	RW	%
0x0169	Cooling mode running - Minimum allowed ambient temperature	10~60	RW	C
0x016A	Heating mode running - Maximum allowed ambient temperature	10~60	RW	C
0x016B	Hot water mode running - highest ambient temperature	10~60	RW	C
0x016C	Hot water set temperature - highest temperature	30~80	RW	C

0x016D	Hot water set temperature - lowest temperature	10~30	RW	C
0x016E	Heating set temperature - highest temperature	30~80	RW	C
0x016F	Heating set temperature - lowest temperature	15~30	RW	C
0x0170	Cooling set temperature - highest temperature	20~40	RW	C
0x0171	Cooling set temperature - lowest temperature	5~20	RW	C
0x0172	Number of compressors to choose	1~2	RW	
0x0173	Unit type selection	0~10	RW	0-2-unit /1-3-unit
0x0174	Unit temperature control mode	0~10	RW	0-Water Inlet Temp./1-Water Outlet Temp.
0x0175	Ambient temperature - Allow access to anti-freeze	0~10	RW	C
0x0176	Outlet water temperature - Allow access to anti-freeze	0~20	RW	C
0x0177	Refrigerant type	0~20	RW	1-R410A/2-R32/3-R290
0x0178	Enable/Disable - Anti-condensation function	0~10	RW	0-Enable/1-Disable
0x0179	Low value - Heating frequency shield 1	0-120	RW	Hz
0x017A	High value - Heating frequency shield 1	0-120	RW	Hz
0x017B	Low value - Heating frequency shield 2	0-120	RW	Hz
0x017C	High value - Heating frequency shield 2	0-120	RW	Hz
0x017D	Low value - Heating frequency shield 3	0-120	RW	Hz
0x017E	High value - Heating frequency shield 3	0-120	RW	Hz
0x017F	Low value - Cooling frequency shield 1	0-120	RW	Hz
0x0180	High value - Cooling frequency shield 1	0-120	RW	Hz
0x0181	Low value - Cooling frequency shield 2	0-120	RW	Hz
0x0182	High value - Cooling frequency shielding 2	0-120	RW	Hz
0x0183	Low value - Cooling frequency shield 3	0-120	RW	Hz
0x0184	High value - Cooling frequency shield 3	0-120	RW	Hz
0x0185	Fan module	0~10	RW	0-Integral/1-Individual
0x0186	Low protection value - Water flow rate	0~100	RW	L/min
0x0187	Temperature differential - Allow compressor to start (Valid, P120=1)	0~50	RW	C
0x0188	Ambient temperature - Allow throttling bypass valve to open	-20~50	RW	C
0x0189	Compressor running time - Allow throttling bypass valve to open	0~999	RW	S

0x018A	Compressor frequency - Allow defrosting	40~120	RW	Hz
0x018B	Buffer tank electric heater	0~10	RW	0-Enable/1-Disable/2-AHS
0x018C	DHW electric heater	0~10	RW	0-Enable/1-Disable/2-AHS
0x018D	Dew point temperature duration - Allow defrosting	0~60	RW	min
0x018E	Dew point constant - Allow defrosting	0~60	RW	
0x018F	Inlet water temperature - Allow defrosting	0~60	RW	C
0x0190	Ambient temperature - Allow defrosting	-20~30	RW	C
0x0191	Antifreeze protection value - heat exchanger	-20~10	RW	C
0x0192	Water pump PWM - range setting value	0~100	RW	L/min
0x0193	Antifreeze mode - Cooling Coil	0~10	RW	0-Low pressure /1-Temperature /2-Low pressure+ Temperature
0x0194	Antifreeze temperature - Cooling Coil	-30-10	RW	C
0x0195	Limit frequency value - Overheat outlet temperature	40-80	RW	C
0x0196	Water pump - secondary heating/cooling system	0~10	RW	0-Power on run/1-Power on/ 2- Linkage demand switch/ 3- Temperature control
0x0197	Return differential - Hot water heat source	0-40	RW	C
0x0198	Return differential - Heating heat source	0-40	RW	C
0x0199	Upper temperature limit - Hot water heat source combined temperature	15-80	RW	C
0x019A	Upper temperature limit - Heating water heat source combined temperature	15-80	RW	C
0x019B	Compressor code	0~9999	RW	
0x019C	ON/OFF - Auxiliary electronic expansion valve	0~10	RW	0-Enable/1-Disable
0x019D	Auxiliary electronic expansion valve to reduce the temperature differential	0~99	RW	C
0x019E	Ambient temperature - Heating Limit Outlet Temperature	-45~30	RW	C
0x019F	Temperature limit constant a	0~150	RW	
0x01A0	Temperature limit coefficient b	-500~500	RW	
0x01A1	Auxiliary pump selection	0~10	RW	0-DHW/1-Cooling/2-Underfloor heating/3-Heating&Cooling/4-Above all
0x01A2	Anti-freezing interval - Hot water pipes	0~360	RW	min
0x01A3	Water pump speed regulation - Minimum speed	0~70	RW	%
0x01A4	Level control	0~10	RW	0-Enable/3-Disable
0x01A5	Load return differential	1~15	RW	C
0x01A6	Lightening back to the poor	1~15	RW	C
0x01A7	Stop back to the poor	1~15	RW	C
0x01A8	Hot water mode start ratio	1~100	RW	%
0x01A9	Non-hot water mode start ratio	1~100	RW	%
0x01AA	Loading cycle	3~60	RW	min



0x01AB	Ambient temperature - Shielded low voltage switch protection	-50~0	RW	C
0x01AC	DC fan target frequency constant c - heating	40~70	RW	HZ
0x01AD	Fan minimum target frequency - heating	20~65	RW	Hz
0x01AE	Main valve opening - defrost	0~480	RW	P
0x01AF	Pump interval cycle - unit shutdown at constant temperature	0~360	RW	min
0x01B0	Compressor minimum running time - in defrosting	0-999	RW	S
0x01B1	Defrost frequency setting value - in different water temperature	0~80	RW	C
0x01B2	Defrosting frequency - High water temperature	40~120Hz	RW	Hz
0x01B3	Target frequency - Power mode	0~40Hz	RW	Hz
0x01B4	Target frequency upper limit- Power mode	0~40	RW	Hz
0x01B5	Defrost selection - Evaporate side	0~2	RW	0-Current/1-Heating/2-DHW
0x01B6	Pipe electric heating option	0~2	RW	0-3kW+6kW/ 1- 3kW/ 2-6kW/ 3- Disabled
0x01B7	Parameter password setting	0~9999	RW	0-Diasble
0x01B8	D1 working condition compressor frequency	0~120	RW	HZ
0x01B9	C1 working condition compressor frequency	0~120	RW	HZ
0x01BA	B1working condition compressor frequency	0~120	RW	HZ
0x01BB	A1working condition compressor frequency	0~120	RW	HZ
0x01BC	F1 working condition compressor frequency	0~120	RW	HZ
0x01BD	D2 working condition compressor frequency	0~120	RW	HZ
0x01BE	C2 working condition compressor frequency	0~120	RW	HZ
0x01BF	B2 working condition compressor frequency	0~120	RW	HZ
0x01C0	A2 working condition compressor frequency	0~120	RW	HZ
0x01C1	F2 working condition compressor frequency	0~120	RW	HZ
0x01C2	D1 working condition fan frequency	0~60	RW	HZ
0x01C3	C1 working condition fan frequency	0~60	RW	HZ
0x01C4	B1 working condition fan frequency	0~60	RW	HZ
0x01C5	A1 working condition fan frequency	0~60	RW	HZ
0x01C6	F1 working condition fan frequency	0~60	RW	HZ
0x01C7	D2 working condition fan frequency	0~60	RW	HZ
0x01C8	C2 working condition fan frequency	0~60	RW	HZ

0x01C9	B2 working condition fan frequency	0~60	RW	HZ
0x01CA	A2 working condition fan frequency	0~60	RW	HZ
0x01CB	F2 working condition fan frequency	0~60	RW	HZ
0x01CC	D1 working condition main valve target overheat	-10~10	RW	C
0x01CD	C1 working condition main valve target overheat	-10~10	RW	C

0x01CE	B1 working condition main valve target overheat	-10~10	RW	C
0x01CF	A1 working condition main valve target overheat	-10~10	RW	C
0x01D0	F1 working condition main valve target overheat	-10~10	RW	C
0x01D1	D2 working condition main valve target overheat	-10~10	RW	C
0x01D2	C2 working condition main valve target overheat	-10~10	RW	C
0x01D3	B2 working condition main valve target overheat	-10~10	RW	C
0x01D4	A2 working condition main valve target overheat	-10~10	RW	C
0x01D5	F2 working condition main valve target overheat	-10~10	RW	C
0x01D6	Initial opening of main valve in D1 working condition	0~500	RW	P
0x01D7	Initial opening of main valve in C1 working condition	0~500	RW	P
0x01D8	Initial opening of main valve in B1 working condition	0~500	RW	P
0x01D9	Initial opening of main valve in A1 working condition	0~500	RW	P
0x01DA	Initial opening of main valve in F1 working condition	0~500	RW	P
0x01DB	Initial opening of main valve in D2 working condition	0~500	RW	P
0x01DC	Initial opening of main valve in C2 working condition	0~500	RW	P
0x01DD	Initial opening of main valve in B2 working condition	0~500	RW	P
0x01DE	Initial opening of main valve in A2 working condition	0~500	RW	P
0x01DF	Initial opening of main valve in F2 working condition	0~500	RW	P
0x01E0	D1 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E1	C1 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E2	B1 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E3	A1 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E4	F1 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E5	D2 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E6	C2 working condition auxiliary valve target overheat	-10~10	RW	C
0x01E7	Auxiliary valve target overheats in B2 working condition	-10~10	RW	C
0x01E8	Auxiliary valve target overheats in A2 working condition	-10~10	RW	C
0x01E9	Auxiliary valve target overheats in F2 working condition	-10~10	RW	C
0x01EA	Initial opening of auxiliary valve in D1 working condition	0~500	RW	P

0x01EB	Initial opening of auxiliary valve in C1 working condition	0~500	RW	P
0x01EC	Initial opening of auxiliary valve in B1 working condition	0~500	RW	P
0x01ED	Initial opening of auxiliary valve in A1 working condition	0~500	RW	P
0x01EE	Initial opening of auxiliary valve in F1 working condition	0~500	RW	P
0x01EF	Initial opening of auxiliary valve in D2 working condition	0~500	RW	P
0x01F0	Initial opening of auxiliary valve in C2 working condition	0~500	RW	P
0x01F1	Initial opening of auxiliary valve in B2 working condition	0~500	RW	P
0x01F2	Initial opening of auxiliary valve in A2 working condition	0~500	RW	P
0x01F3	Initial opening of auxiliary valve in F2 working condition	0~500	RW	P
0x01F4	Target water flow in low water temperature condition	0~100	RW	L/min
0x01F5	Target water flow under high water temperature conditions	0~100	RW	L/min
0x01F6	Low water temperature rated fan frequency	0~60	RW	Hz
0x01F7	Initial opening of main valve under low water temperature rated condition	0~500	RW	P
0x01F8	High water temperature rated fan frequency	0~60	RW	Hz
0x01F9	Initial opening of main valve under high water temperature rated condition	0~500	RW	P
0x01FA	Target overheat of main valve under low water temperature rated condition	-10~10	RW	C
0x01FB	PFC shutdown current	0~50	RW	A
0x01FC	Target overheat of main valve under high water temperature rated condition	-10~10	RW	C
0x01FD	PFC turn-on current	0~50	RW	A
0x01FE	Heating medium	0~1	RW	0-Water/1-Antifreeze Liquid
0x01FF	Smart Grid Options - On/Off	0~1	RW	0-Enable/1-Diasble
0x0200	Smart Grid Options - Peak grid running time	30~999	RW	min
0x0201	Dual temperature zone selection	0~2	RW	1-Power on/2-Power on/off on demand/3-temperature control
0x0202	Mixed water regulating valve cycle	5~20	RW	min
0x0203	Mixing valve full cycle time	0~180	RW	S
0x0204	Maximum water pump speed	50~99	RW	%
0x0205	Water pump speed - at constant temperature	20~99	RW	%
0x0206	Testing mode - on/off	0~1	RW	0-Enable/1-Diasble
0x0207	Frequency increase time - Exit exhaust overheat limit	3~240	RW	min
0x0208	Percentage correction for main valve opening - Running at initial frequency	30~100	RW	%

0x0209	Percentage of mixing valve adjustment			
0x020A	Dual temperature zone mode selection	0 ~ 1	RW	0-Standard Dual Temperature Zone / 1-Intelligent Dual Temperature Zone
0x020B	Dual temperature zone control return temperature	0 ~ 30	RW	C

#### 4. User Parameter 0x0300~0x032F

Address	Name	Address Ranges	Default Value	Read-Write	Note
0x0300	Temp. Set-Cooling	7-25	12	RW	
0x0301	Temp. Set-Heating	20-60	55	RW	
0x0302	Temp. Set-Hot Water	20-75	55	RW	
0x0303	Temp. Set-Floor Heating	20-60	50	RW	
0x0304	Mode	0-Cooling 1-Heating 2-DHW 3-Floor Heating 4-DHW + Cooling 5-DHW + Heating 6-Reserve 7-DHW + Floor Heating		RW	
0x0305	ON/OFF	0-OFF/1-ON		RW	
0x0306	Indoor Temperature Setting			RW	
0x0307	User Functions	0-Standard Mode 1-Powerful Mode 2-Silent mode		RW	
0x0308	Reserve			RW	
0x0309	Reserve			RW	
0x030A	Function Mode	Reserve		RW	
0x030B				RW	
0x030C	Heating/ Underfloor Heating Curve Setting	High 8-bit: Underfloor heating curve		RW	
		Low 8-bit: heating curve			
0x030D	Hot water/ cooling curve setting	High 8-bit: cooling curve		RW	
		Low 8-bit: hot water curve			
0x030E	Reserve			RW	
0x030F	Reserve			RW	
0x0310	Reserve			RW	
0x0311	Reserve			RW	
0x0312	Reserve			RW	
0x0313	Cooling Setting Curve	0-8 11- 18	0	RW	Communication protocol ≥ 130 valid
0x0314	Heating Setting Curve	0-8 11- 18	0	RW	Communication protocol ≥ 130 valid
0x0315	Hot Water Setting Curve	0-4	0	RW	Communication protocol ≥ 130 valid
0x0316	Underfloor Heating Setting Curve	0-8 11- 18	0	RW	Communication protocol ≥ 130 valid

0x0317	Temp. Zone 2				
0x0318					
0x0319	Temp. Zone 1				

NOTE: 0-Disable/1-8High Temp. Curve 1-8/11/2-Low Temp. Curve 1-8

<b>5. User Commands 0x0330~0x035F</b>						
<b>Unit forced control, frequency/speed of forced control</b>						
<b>Address</b>	<b>Name</b>	<b>Address Ranges</b>		<b>Default Value</b>	<b>Read-Write</b>	<b>Note</b>
0x0330	Unit Control	Bit0	0		RW	
		Bit1	0			
		Bit2	Quick Heat Mode			
		Bit3	Forced entry defrost			
		Bit4	System Evacuation Mode			
		Bit5	Refrigerant Recovery			
		Bit6	0			
		Bit7	0			
		Bit8	Forced sterilization			
		Bit9	0			
		Bit10	Allowed water return			
		Bit11	0			
		Bit12	0			
		Bit13	Restore Factory Defaults			
		Bit14	0			
Bit15	0					
0x0331	Load Forcing Control	Bit0	Compressor Forced Control		RW	
		Bit1	EEV forced control			
		Bit2	EVI forced control			
		Bit3	Fan forced control			
		Bit4	0			
		Bit5	0			
		Bit6	0			
		Bit7	0			
		Bit8	0			
		Bit9	0			
		Bit10	0			
		Bit11	0			
		Bit12	0			
		Bit13	0			
Bit14						
0x0332	Compressor 1 forced frequency	0-120Hz			RW	
0x0333	Compressor 2 forced frequency	0-120Hz			RW	
0x0334		0			RW	
0x0335		0			RW	
0x0336	EEV 1 forced open	0-500P			RW	
0x0337	EEV 2 forced open	0-500P			RW	
0x0338		0			RW	
0x0339		0			RW	
0x033A	EVI EEV 1 forced	0-500P			RW	

	open				
0x033B	EVI EEV 2 forced open	0-500P		RW	
0x033C		0		RW	
0x033D		0		RW	
0x033E	Fan forced speed	0-80Hz		RW	
0x033F		0		RW	
0x0340		0		RW	
0x0341		0		RW	
0x0342		0		RW	
0x0343	DC Pump Control	0-Auto/1-Manual			
0x0344	DC Pump Output	0- 100%			
0x0345	PFC control	0-Auto/1-Open/Close/2-Open			
0x0346					

#### 6. Version Information 0x0360~0x036F (Product Model,/Customized Version/Software Version)

Address	Name	Address Ranges	Default Value	Read-Write	Note
0x0360	Program Version	100		R	V1.0.
0x0361	Product Type	0		R	
0x0362	Product Type ID Number	1		R	
0x0363	Protocol Version	100		R	V1.0.0

NOTE:

Product Type:

0-Commercial inverter unit/1-Domestic ON/OFF unit/2-Commercial ON/OFF unit

Product Type ID Number

0-Commercial inverter unit/0: Commercial inverter 2-unit/1- Commercial inverter 3-unit

1-Domestic ON/OFF unit/0-Domestic inverter unit

2-Commercial ON/OFF unit/0-Commercial inverter unit

#### 7. Factory Parameter L 0x0800~0x083F

Parameter numbers start from L11; L0-L10 remain unchanged.

Address	Name	Address Ranges	Read-Write	Note
0x0800	Pipeline electric heater loading cycle	1~300min	RW	
0x0801	Sterilization	0~2	RW	
0x0802	Days between Sterilizations	5~30 Day	RW	
0x0803	Sterilization Start-up Time	00:00-24:00	RW	
0x0804	Sterilization Running Time	0-50Min	RW	
0x0805	Sterilization Temp Setting	50-80C	RW	
0x0806			RW	

0x0807			RW	
0x0808			RW	
0x0809			RW	
0x080A			RW	
0x080B	DHW return water Setting	0~10	RW	0-Disable / 1-Continuous return / 2-Cycle return / 3-Temperature difference return
0x080C	Return Water Temp Setting	20~65℃	RW	
0x080D	Return Water Return Temp Differential	1~15℃	RW	
0x080E	Return Water Interval Period	3~90min	RW	
0x080F	Return Water Running Period	1~30min	RW	
0x0810	Heating low temperature curve DIY	0~1	RW	0-Enable /-Disable
0x0811	Heating low temperature curve coefficient k	0~-50	RW	Set temperature = k*(ambient temperature + 15) + b
0x0812	Heating low temperature curve constant b	30~80	RW	Set temperature = k*(ambient temperature + 15) + b
0x0813	Heating capacity statistics	0~1	RW	0-Enable /-Disable
0x0814	External pump flow rate	0~999	RW	Unit: L/min
0x0815	Hot water electric heater power	0~9999	RW	Unit: W
0x0816	Pipe electric heater 1 power	0~9999	RW	Unit: W
0x0817	Pipe electric heater 2 power	0~9999	RW	Unit: W
0x0818	Heating electric heater power	0~9999	RW	Unit: W
0x0819	External water pump power	0~9999	RW	Unit: W
0x081A				

**8. Coil Address 0X1000-0X10FF  
Access Command 01H 、 05H**

Address	Name	Address Ranges	Read-Write	Note
0x1000	Powerful Mode		RW	
0x1001	Silent Mode		RW	
0x1002	Reserve		RW	
0x1003	Reserve		RW	
0x1004	Reserve		RW	
0x1005	Reserve		RW	
0x1006	Reserve		RW	
0x1007	Reserve		RW	
0x1008	Reserve		RW	
0x1009	Reserve		RW	
0x100A	Reserve		RW	
0x100B	Reserve		RW	
0x100C	Reserve		RW	
0x100D	Reserve		RW	
0x100E	Reserve		RW	
0x100F	Reserve		RW	
0x1010	Reserve		RW	
0x1011	Reserve		RW	
0x1012	Quick Heat Mode		RW	
0x1013	Force Enter Defrost		RW	
0x1014	System Drain Mode		RW	
0x1015	Refrigerant Recovery		RW	
0x1016	Reserve		RW	
0x1017	Reserve		RW	
0x1018	Force Sterilization		RW	



	Restore factory defaults			
0x1019	Reserve		RW	
0x101A	Allow Return Water		RW	
0x101B	Reserve		RW	
0x101C	Reserve		RW	
0x101D	Restore Factory Setting		RW	
0x101E	Reserve		RW	
0x101F	Reserve		RW	
0x1020	Compressor Forced Control		RW	
0x1021	EEV Forced Control		RW	
0x1022	EVI Forced Control		RW	
0x1023	Fan Forced Control		RW	
0x1024				
0x1025				
0x1026				
0x1027				
0x1028				
0x1029				
0x102A				
0x102B				
0x102C				
0x102D				
0x102E				
0x102F				