HouseHeating

Engineering Manual
R290

HH-C1-6
HH-C3-8
HH-C3-12
HH-C3-18

By HGB-Trading

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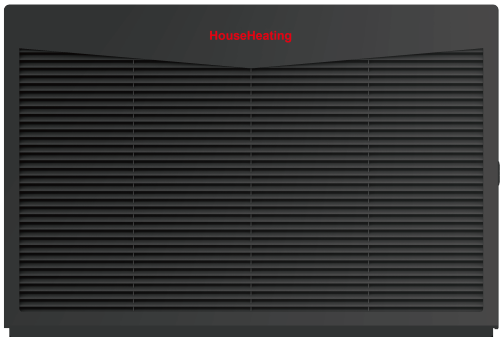
1 General

1.1Unit General Information

1.1.1 Appearances

Model	HH-C1-6/HH-C3-8/HH-C3-12
Picture	
Model	**HH-C3-18**
Picture	

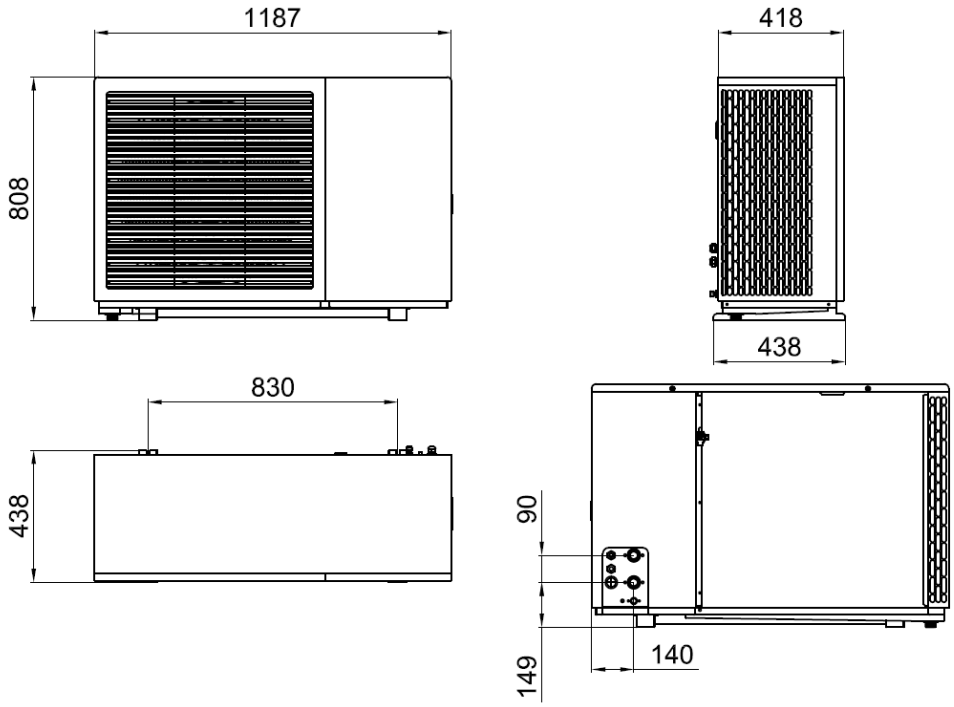
1.1.2 Model Specification

Model	Unit	HH-C1-6	HH-C1-8	HH-C1-12	HH-C1-18	HH-C3-8	HH-C3-12	HH-C3-18
Power Supply	/	220-240~/50Hz				380-415/3N~/50Hz		
Test Standard：EN14511 Ambient Temperature:7 ℃/6 ℃(DB/WB),Water Inlet/Outlet：30 ℃/35 ℃								
Heating Capacity Min./Max	kW	2.92-9.10	4.10-12.10	4.30-15.20	7.24-21.90	4.10-12.10	4.30-15.20	7.24-21.90
Power Input Min./Max	kW	0.61-2.11	0.79-2.85	0.87-3.73	1.50-5.88	0.79-2.85	0.87-3.73	1.50-5.88
Rated Heating Capacity	kW	6.23	8.24	12.05	18.01	8.24	12.05	18.01
COP	/	4.77	4.96	4.62	4.4	4.96	4.62	4.4
Test Standard：EN14511 Ambient Temperature:7 ℃/6 ℃(DB/WB),Water Inlet/Outlet：47 ℃/55 ℃								
Heating Capacity Min./Max	kW	2.99-8.16	4.05-12.15	4.25-14.55	6.36-19.45	4.05-12.15	4.25-14.55	6.36-19.45
Power Input Min./Max	kW	1.03-2.92	1.38-4.06	1.45-4.28	2.15-6.87	1.38-4.06	1.45-4.28	2.15-6.87
Rated Heating Capacity	kW	6.12	8.13	12.18	18	8.13	12.18	18
COP	/	3.06	3.12	3.01	3.02	3.12	3.01	3.02
Test Standard：EN14511 Ambient Temperature:35 ℃/24 ℃(DB/WB), Water Inlet/Outlet：12 ℃/7 ℃								
Cooling Capacity Min./Max	kW	1.38-5.7	3.65-8.59	3.65-11.04	4.55-17.20	3.65-8.59	3.65-11.04	4.55-17.20
Power Input Min./Max	kW	0.67-2.44	1.12-3.31	1.12-3.97	1.85-7.31	1.12-3.31	1.12-3.97	1.85-7.31
Rated Cooling Capacity	kW	4.56	7.55	8.23	14.32	7.55	8.23	14.32
EER	/	2.67	3.08	2.59	2.44	3.08	2.59	2.44
Test Standard：EN14511 Ambient Temperature:35 ℃/24 ℃(DB/WB), Water Inlet/Outlet：23 ℃/18 ℃								
Cooling Capacity Min./Max	kW	1.85-7.41	4.56-10.14	4.56-13.03	5.59-22.36	4.56-10.14	4.56-13.03	5.59-22.36
Power Input Min./Max	kW	0.56-2.68	1.44-4.80	1.44-4.8	1.69-8.04	1.44-4.80	1.44-4.8	1.69-8.04
Rated Cooling Capacity	kW	5.9	8.11	10.43	17.89	8.11	10.43	17.89
EER		3.16	3.61	3.1	3.18	3.61	3.1	3.18
Test Standard:EN14825-2022 Low temperature application(35℃)								
SCOP	/	4.83	4.93	4.77	4.81	4.84	4.74	4.79
Energy Efficiency Class	/	A+++	A+++	A+++	A+++	A+++	A+++	A+++
Test Standard:EN14825-2022 Medium temperature application(55℃)								
SCOP	/	3.71	3.72	3.77	3.72	3.6	3.7	3.71
Energy Efficiency Class	/	A++	A++	A++	A++	A++	A++	A++
Operation Mode: Heating								
Operating Range	℃	-25~35						
Water Outlet Temp. Range	℃	20~75						
Operation Mode: Cooling								
Operating Range	℃	15-45						
Water Outlet Temp. Range	℃	5~25						
Operation Mode: DHW								
Operating Range	℃	-25~45						
Water Outlet Temp. Range	℃	20~65						
Test Standard:EN12102-2022 Ambient Temperature:7 ℃,Water Outlet：35 ℃								
Sound Pressure Level	dB(A)	46	43	52	54	43	53	55
Sound Power Level	dB(A)	60	58	67	70	58	67	70
Test Standard:EN12102-2022 Ambient Temperature:7 ℃,Water Outlet：55 ℃								
Sound Pressure Level	dB(A)	46	43	53	54	43	54	56
Sound Power Level	dB(A)	60	58	68	70	58	68	72
Power Input Max.	kW	3.5	5.4	5.4	7.5	5.85	5.85	10.5
Current Input Max.	A	15	25	25	35	10	10	17
Refrigerant Type	/	R290						
Operation Pressure (Low Pressure Side)	MPa	0.8						

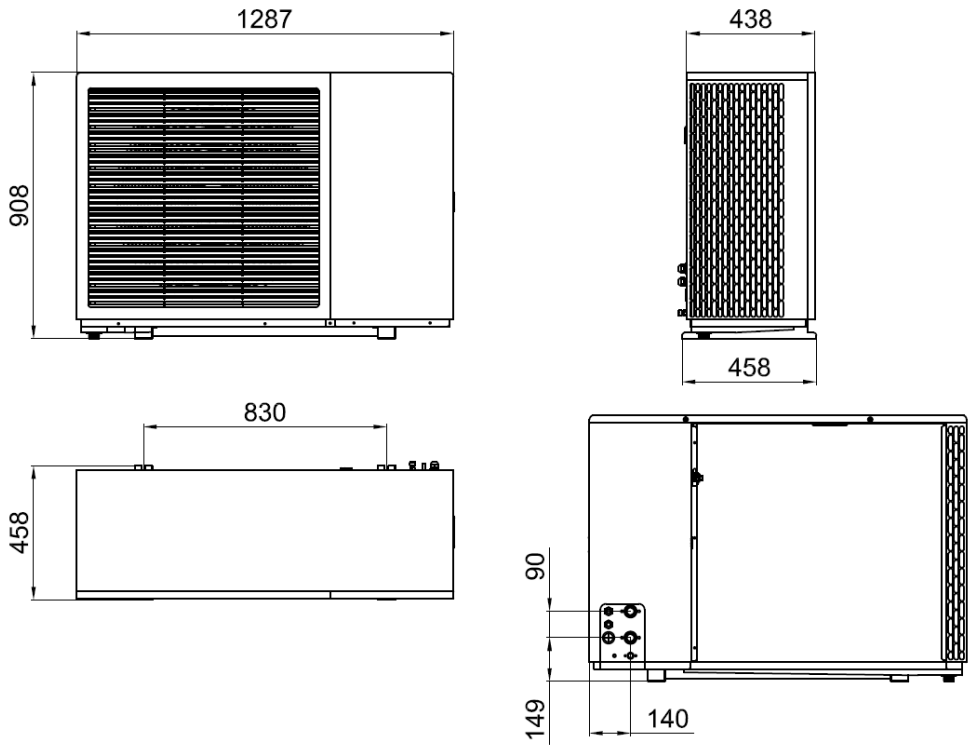
Model	Unit	HH-C1-6	HH-C1-8	HH-C1-12	HH-C1-18	HH-C3-8	HH-C3-12	HH-C3-18
Operation Pressure (High Pressure Side)	MPa	3.9						
Maximum Allowable Pressure	MPa	3.2						
Water Piping Connections	Inch	G1"			G1-1/4"	G1"		G1-1/4"
Expansion Tank	L	6			8	6		8
Water Pressure Drop	kPa	20			55	20		55
Water Pressure Min/Max	MPa	0.1/0.3						
Water Flow Rated	m³/h	1	1.40	2.06	3.1	1.40	2.06	3.1
Net Weight	Kg	110	134	134	134	134	134	134
Note: Parameters are subject to change without prior notice. Please refer to the unit nameplate.								

1.1.3 Unit Dimension

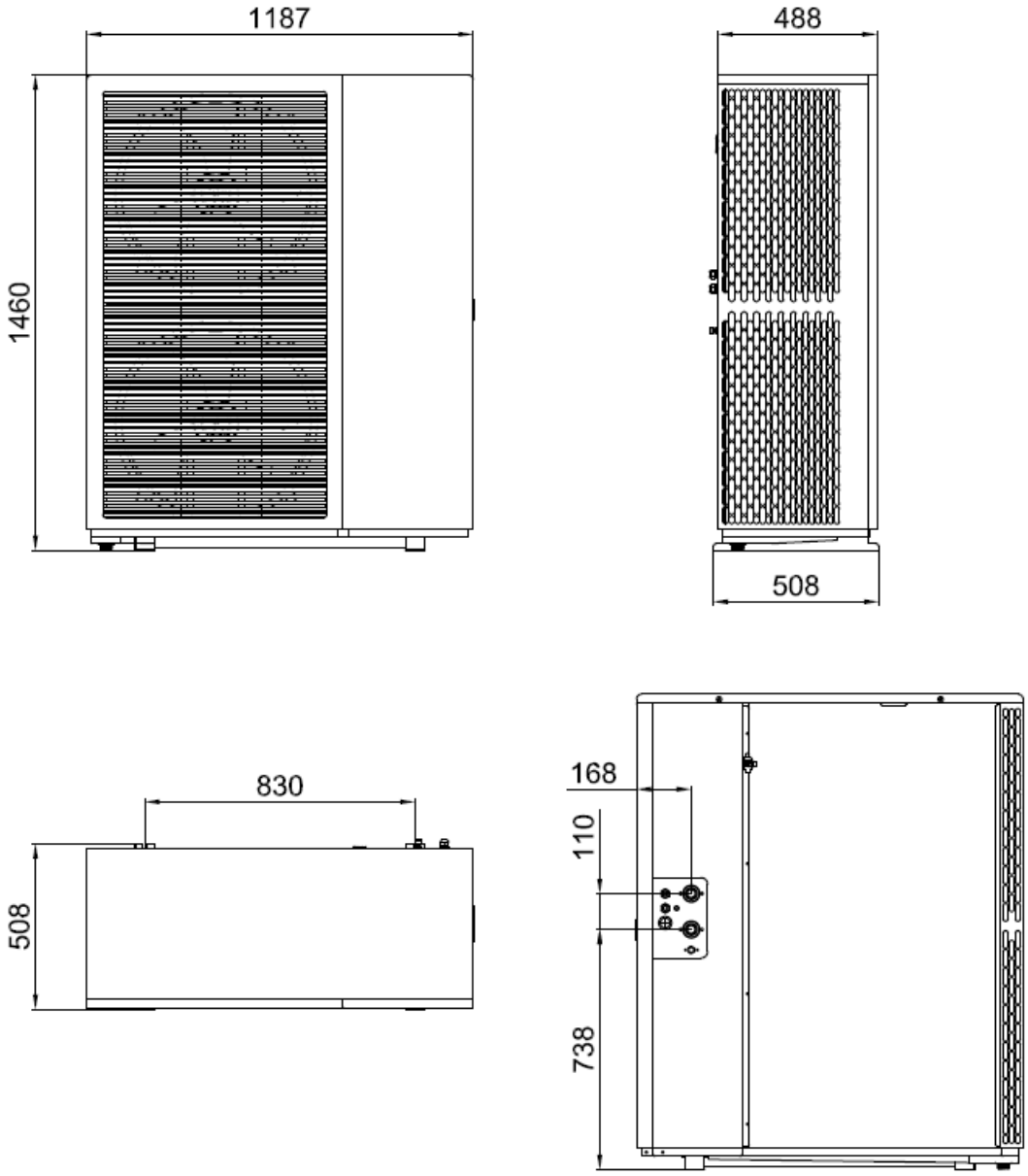
1.1.3.1 HH-C1-6



1.1.3.2 HH-C3-8/HH-C3-12

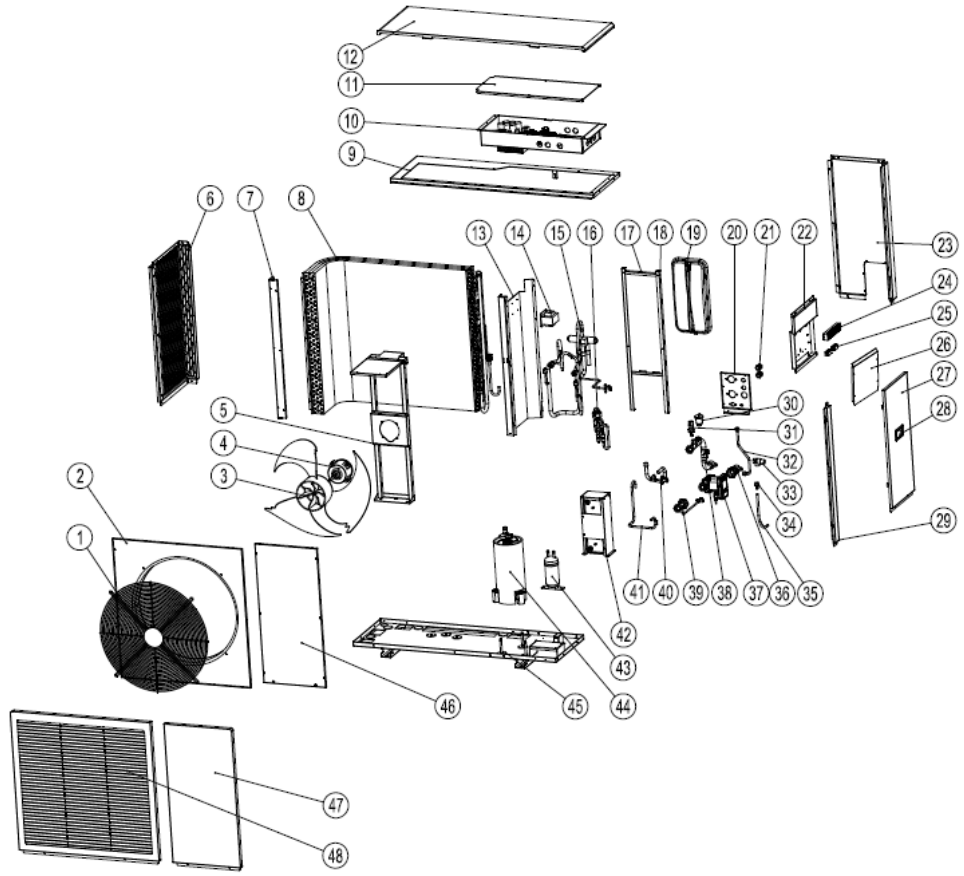


1.1.3.3 HH-C3-18



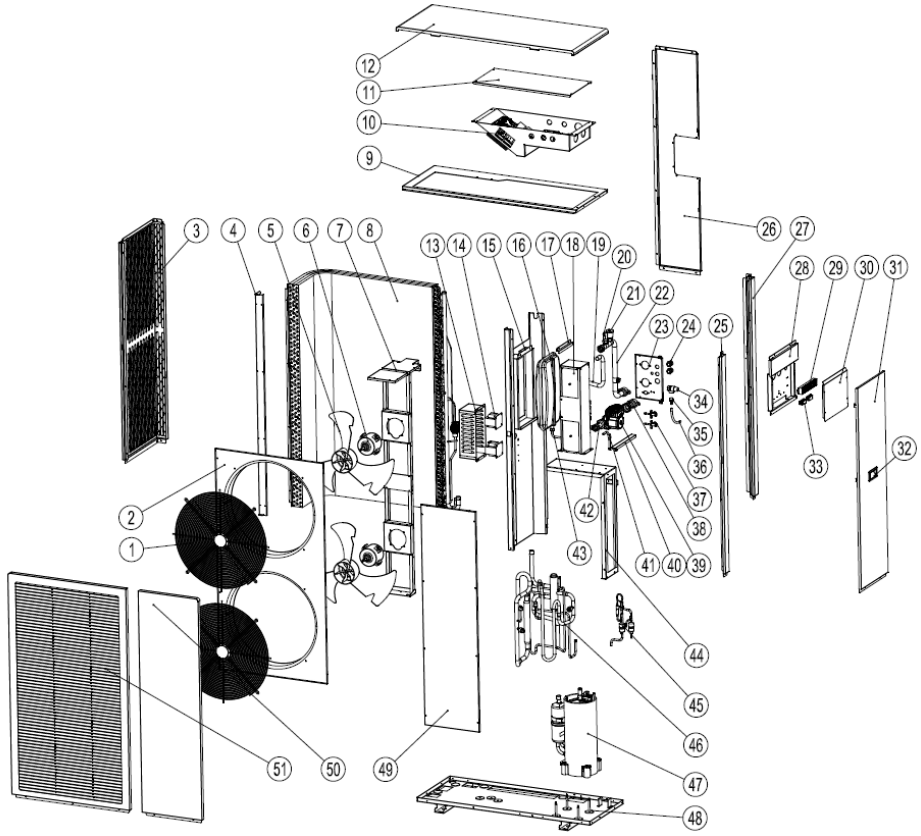
1.1.4 Exploded View

1.1.4.1 HH-C1-6/HH-C3-8/HH-C3-12



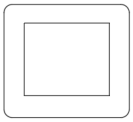
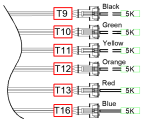
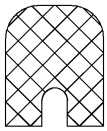
No.	Name	No.	Name	No.	Name
1	Air Cover	17	EEV Support	33	Safe Valve
2	Air Guide	18	Expansion Tank Plate	34	Safe Valve Connector
3	Fan Blade	19	Expansion Tank	35	Drain Hose
4	Fan	20	Valve Block Panel	36	Water Pump Inlet Pipe
5	Fan Support	21	Waterproof Connector	37	Inverter Water Pump
6	Left Side Panel	22	Terminal Block Panel	38	Plate Heat Exchanger Outlet Pipe (Water Side)
7	Left Column	23	Rear Right-Side Panel	39	Plate Heat Exchanger Inlet Pipe (Water Side)
8	Evaporator	24	Terminal Block	40	Plate Heat Exchanger Inlet Pipe (Refrigerant Side)
9	Top Frame	25	Wire Crimp	41	Plate Heat Exchanger Outlet Pipe (Refrigerant Side)
10	Electric Box	26	Wiring Box Cover	42	Plate Heat Exchange
11	Electrical Box Cover	27	Right Side Panel	43	Reservoir (not built-in)
12	Top Cover	28	Handle	44	Compressor
13	Middle Panel	29	Right Front Column	45	Chassis Assembly
14	Reactor	30	Water Flow Switch	46	Right Panel
15	4-Way Valve Assembly	31	Automatic Air Vent	47	Front Right Panel
16	EEV Assembly	32	Expansion Tank Pipe	48	Front Left Panel

1.1.4.2 HH-C3-18



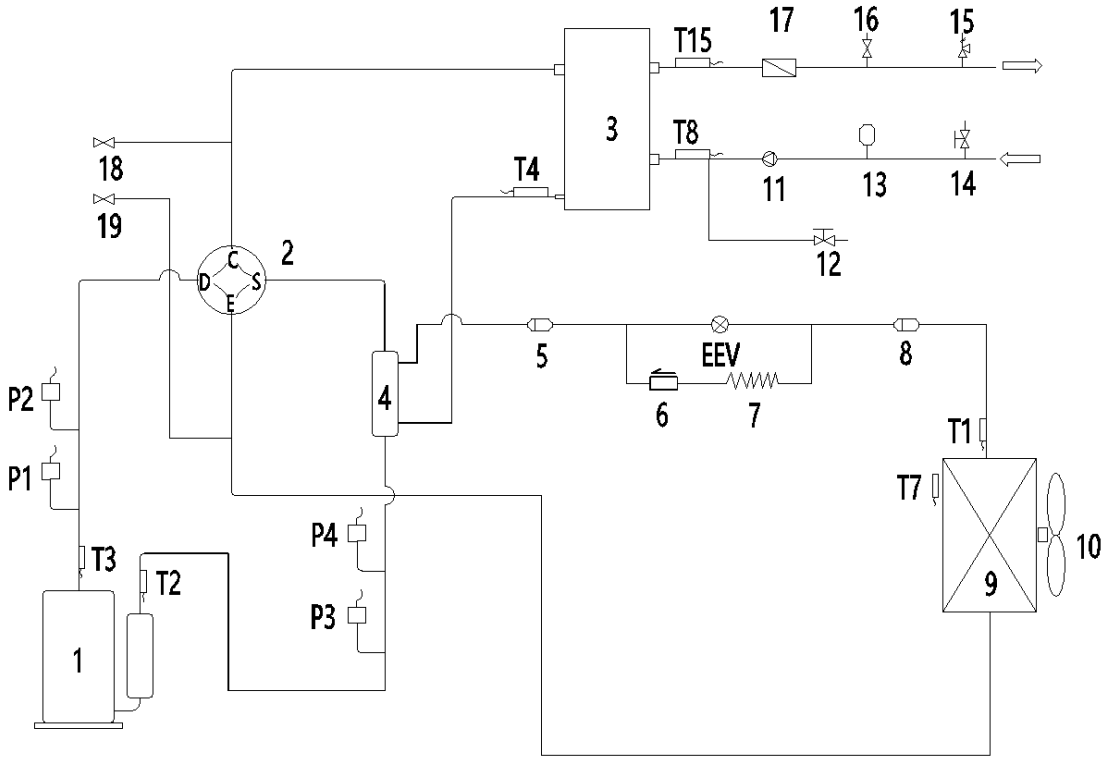
No.	Name	No.	Name	No.	Name	No.	Name
1	Air Cover	14	Reactor	27	Rear Right	40	Water Pump Support
2	Air Guide	15	Middle Panel	28	Terminal Block Panel	41	Plate Heat Exchanger Outlet Pipe (Refrigerant Side)
3	Left Side Panel	16	Expansion Tank	29	Terminal Block	42	Plate Heat Exchanger Inlet Pipe (Water Side)
4	Left Column	17	Expansion Tank Panel	30	Wiring Box Cover	43	Expansion Tank Hose
5	Fan Blade	18	Plate Heat Exchanger	31	Right Side Panel	44	Plate Heat Exchanger Support
6	Fan	19	Plate Heat Exchanger Inlet Pipe (Refrigerant Side)	32	Handle	45	EEV Assemble
7	Fan Support	20	Water Flow Switch	33	Wire Crimp	46	4-Way Valve Assembly
8	Evaporator	21	Automatic Air Vent	34	Safe Valve	47	Compressor
9	Top Frame	22	Plate Heat Exchanger Outlet Pipe (Water Side)	35	Safe Valve Connector	48	Chassis Assembly
10	Electric Box	23	Valve Block Panel	36	Drain Hose	49	Right Panel
11	Electrical Box Cover	24	Waterproof Connector	37	Maintenance Valve	50	Front Right Panel
12	Top Cover	25	Front Right Column	38	Water Pump Inlet Pipe	51	Front Left Panel
13	Reactor Cover	26	Rear Right-Side Panel	39	Inverter Water Pump		

1.1.5 Accessories

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

1.2 Unit System Information

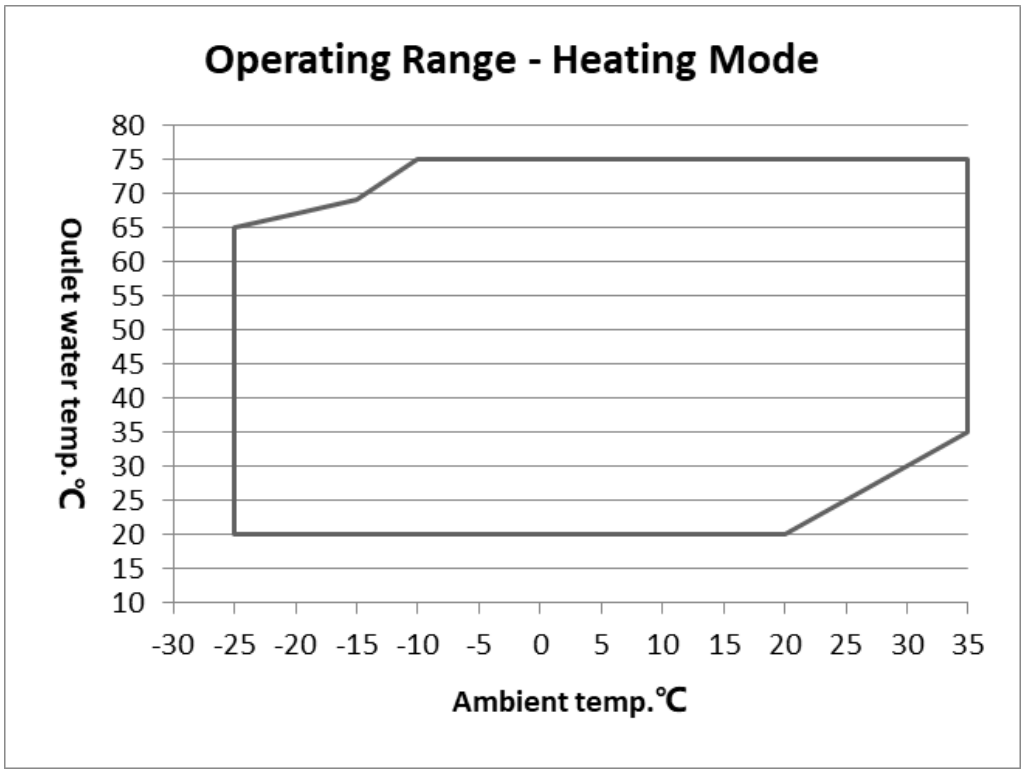
1.2.1 Running Principle

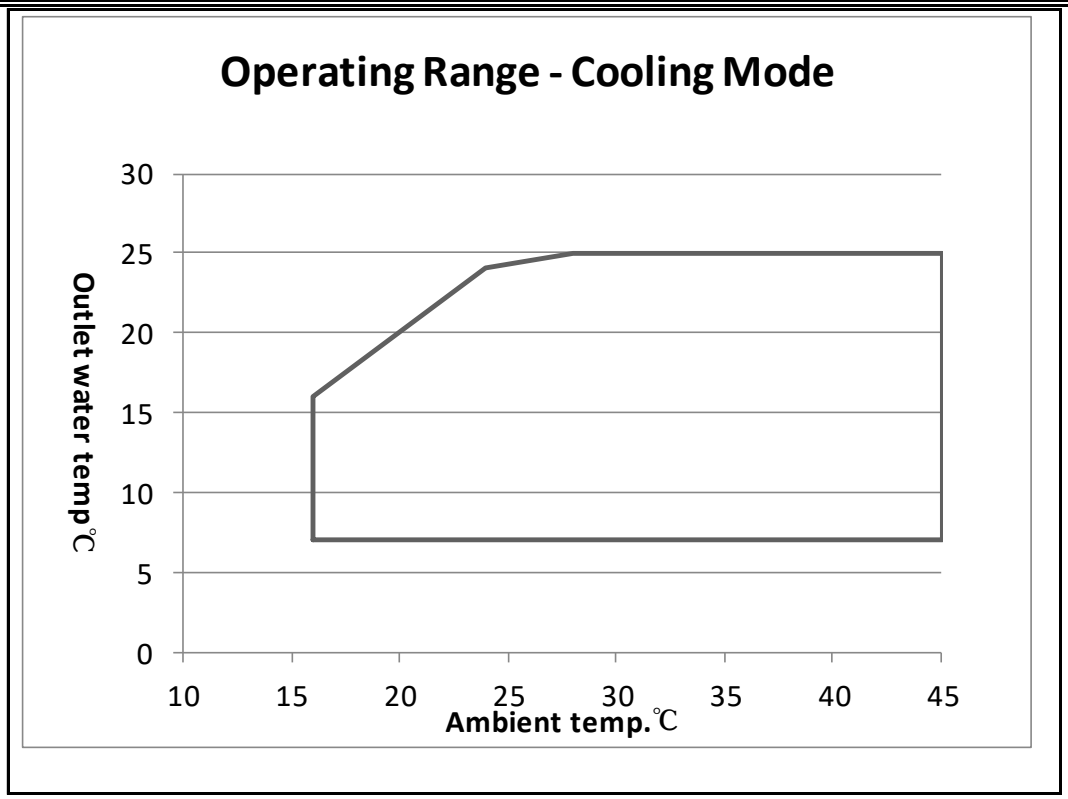


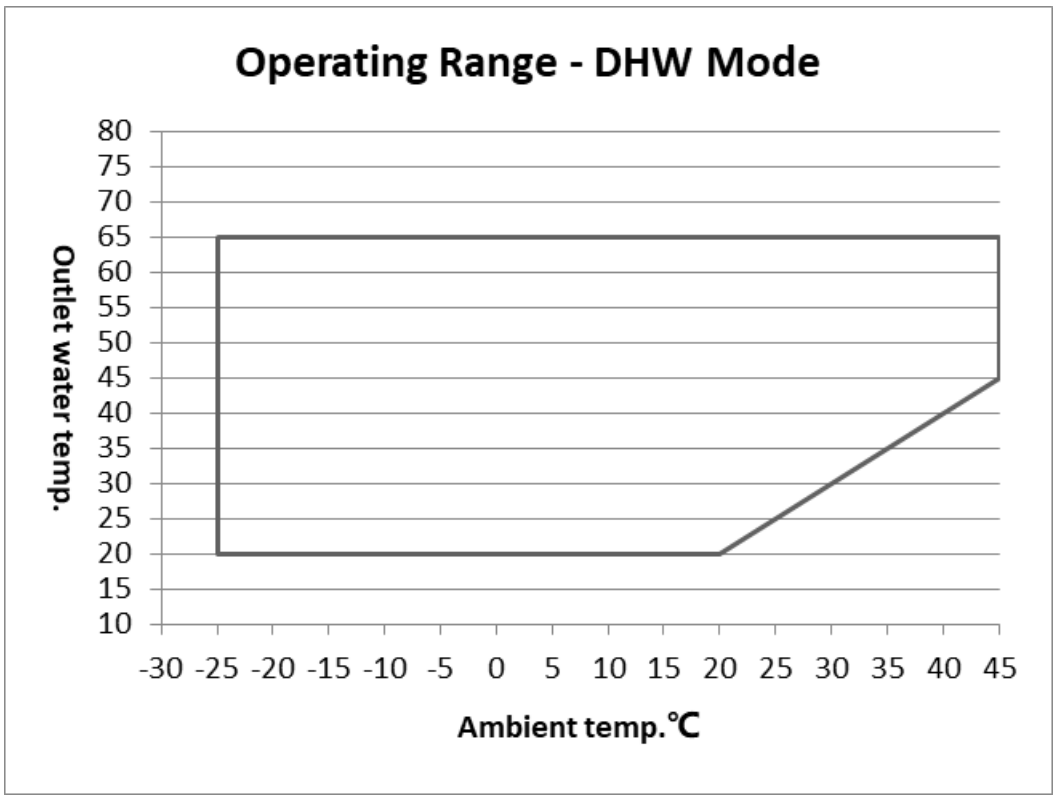
No.	Name	No.	Name	No.	Name
1	Compressor	12	Drain Valve	T4	Cooling Coil Temp. Sensor
2	4-Way Valve	13	Expansion Tank	T7	Ambient Temp. Sensor
3	Plate Heat Exchanger	14	Manual Air Vent (not built-in)	T8	Water Inlet Temp. Sensor

No.	Name	No.	Name	No.	Name
4	Heat Recover	15	Safe Valve	T15	Water Outlet Temp. Sensor
5	Filter 1	16	Air Vent	P1	High Pressure Sensor
6	Single Way Valve	17	Water Flow Switch	P2	High Pressure Switch
7	Capillary	18	Maintenance Valve (High Pressure Side)	P3	Low Pressure Sensor
8	Filter 2	19	Maintenance Valve (Low Pressure Side)	P4	Low Pressure Switch
9	Evaporator	T1	Outer Coil Temp. Sensor	EEV	EEV
10	Fan	T2	Suction Temp. Sensor		
11	Water Pump	T3	Exhaust Temp. Sensor		

1.2.2 Operating Range




Operating Range - Cooling Mode
Outlet water temp.℃
30
25
20
15
10
5
0
10
15
20
25
30
35
40
45
Ambient temp.℃


Operating Range - DHW Mode
Outlet water temp.
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
-30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45
Ambient temp.℃

1.2.3 Rated Capacity Table

1.2.3.1 HH-C1-6

Heating Capacity[1]												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			45			55		
	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	2.93	1.19	2.46	2.90	1.51	1.92	2.88	1.91	1.51	2.85	2.31	1.23
-20	3.36	1.22	2.77	3.34	1.54	2.17	3.31	1.95	1.70	3.28	2.36	1.39
-15	3.87	1.24	3.12	3.84	1.57	2.44	3.80	1.99	1.91	3.77	2.41	1.57
-10	4.33	1.25	3.46	4.30	1.59	2.71	4.26	2.01	2.12	4.22	2.43	1.74
-7	4.68	1.19	3.93	4.64	1.51	3.08	4.60	1.91	2.41	4.56	2.31	1.98
-2	5.05	1.13	4.47	5.01	1.43	3.50	4.97	1.81	2.74	4.93	2.19	2.25
2	5.46	1.07	5.09	5.41	1.36	3.98	5.37	1.72	3.12	5.32	2.08	2.55
7	6.28	1.03	6.09	6.23	1.31	4.77	6.17	1.65	3.74	6.12	2.00	3.06
12	6.53	0.97	6.74	6.47	1.23	5.28	6.42	1.55	4.13	6.36	1.88	3.39
20	6.92	0.87	7.94	6.86	1.10	6.22	6.80	1.40	4.87	6.75	1.69	3.99
27	7.34	0.78	9.35	7.27	0.99	7.32	7.21	1.26	5.73	7.15	1.52	4.70

1.Test Standard : EN14511

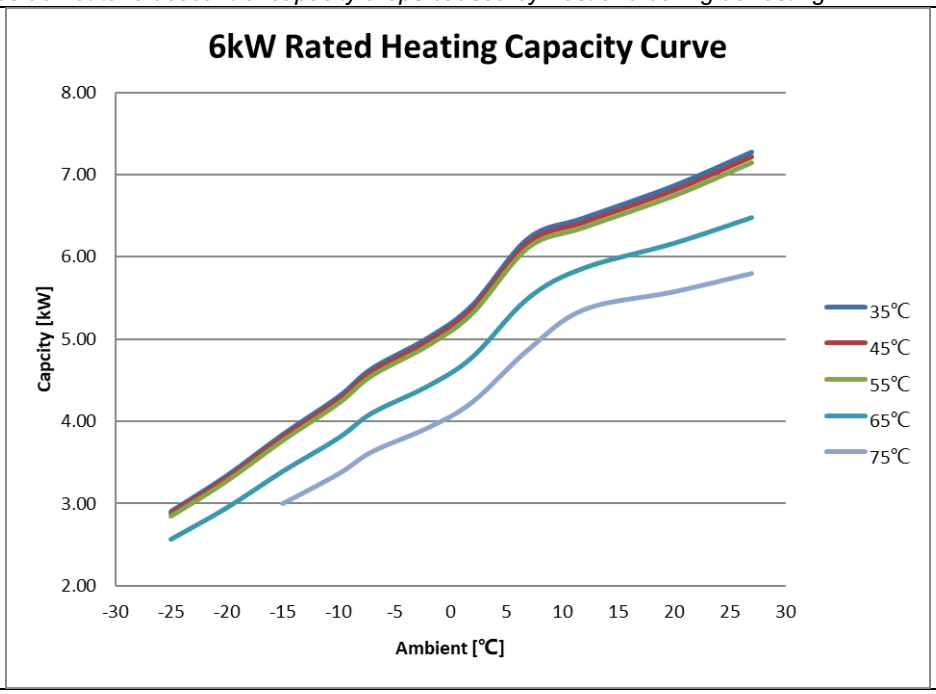
Notes：Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	60			65			70			75		
	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	2.71	2.40	1.13	2.56	2.48	1.03	/	/	/	/	/	/
-20	3.11	2.45	1.27	2.95	2.53	1.16	/	/	/	/	/	/
-15	3.58	2.49	1.44	3.39	2.58	1.31	3.20	2.67	1.20	3.00	2.76	1.09
-10	4.01	2.52	1.59	3.79	2.61	1.45	3.58	2.70	1.33	3.37	2.79	1.21
-7	4.33	2.39	1.81	4.10	2.48	1.65	3.87	2.56	1.51	3.63	2.65	1.37
-2	4.68	2.27	2.06	4.43	2.35	1.88	4.18	2.44	1.71	3.93	2.52	1.56
2	5.05	2.16	2.34	4.78	2.24	2.14	4.51	2.31	1.95	4.24	2.39	1.77
7	5.81	2.07	2.80	5.50	2.15	2.56	5.19	2.22	2.34	4.88	2.29	2.12
12	6.11	1.95	3.14	5.86	2.02	2.91	5.61	2.09	2.69	5.36	2.16	2.49
20	6.45	1.75	3.68	6.16	1.82	3.39	5.87	1.88	3.12	5.58	1.94	2.87
27	6.81	1.58	4.32	6.48	1.63	3.96	6.14	1.69	3.63	5.80	1.75	3.32

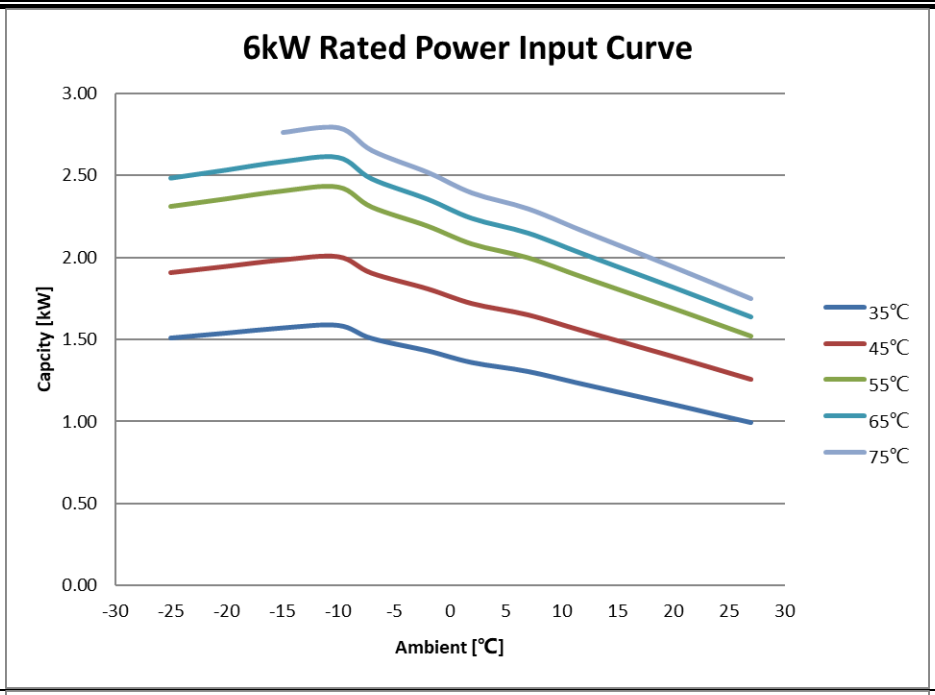
1.Test Standard : EN14511

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

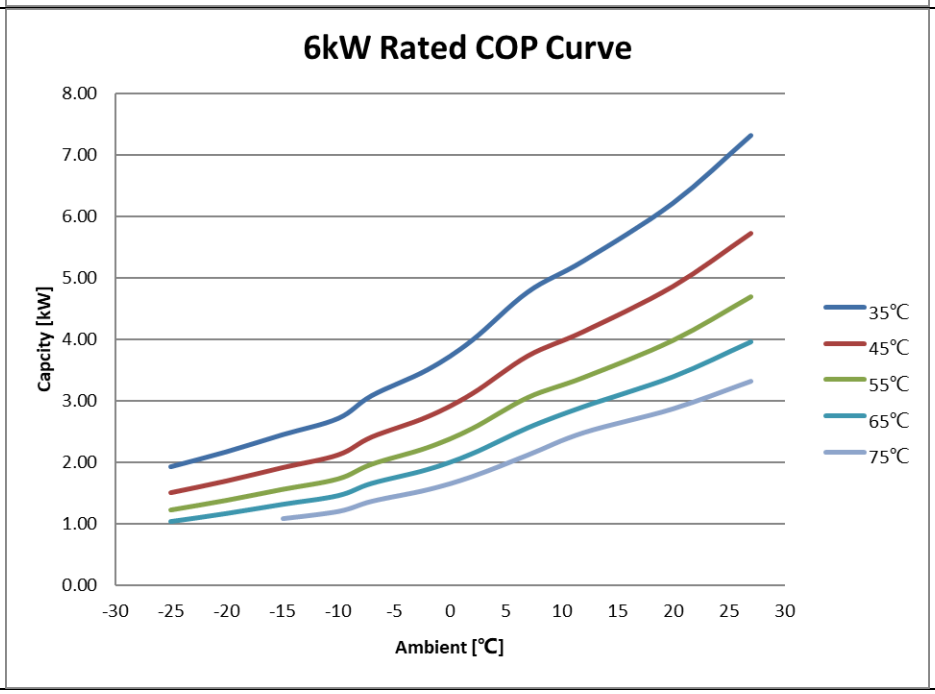
Rated Heating Capacity Curve



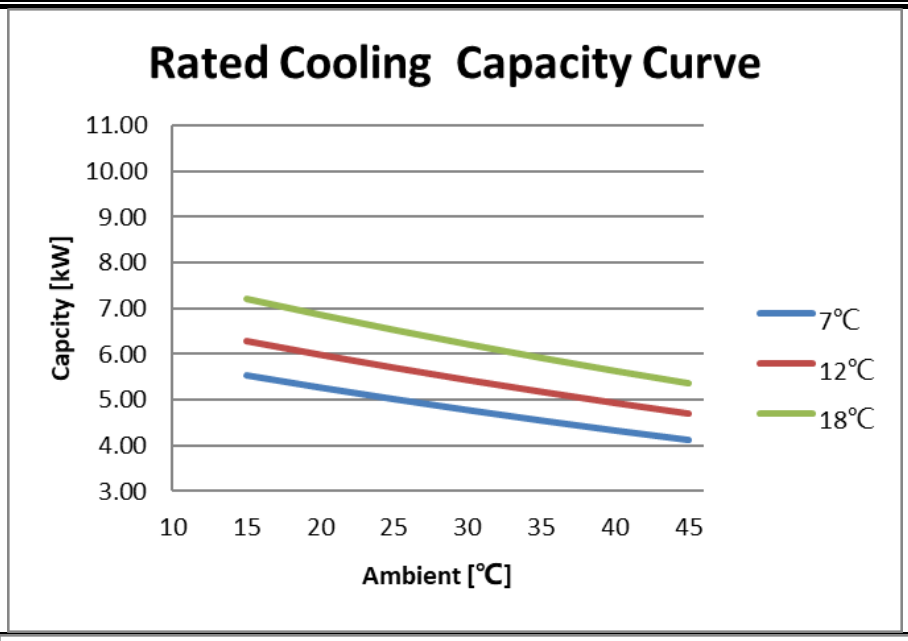
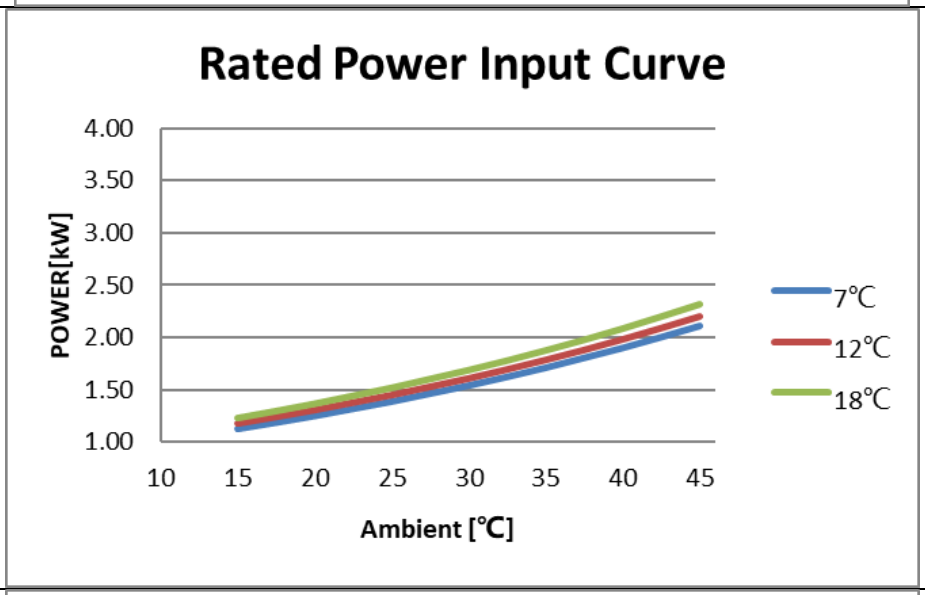
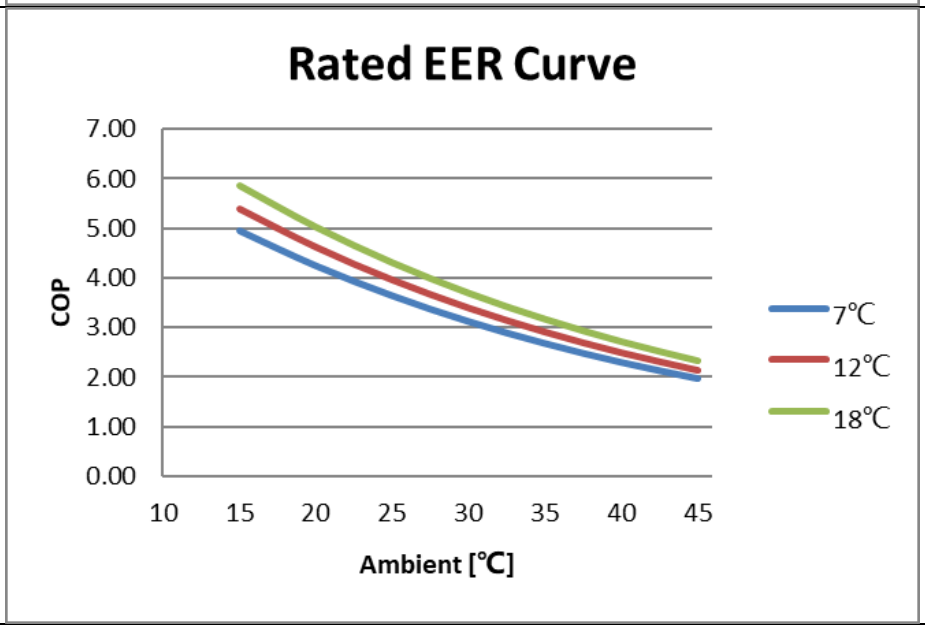
Rated Input Power Curve



Rated COP Curve



Cooling Capacity[1]									
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	5.54	1.12	4.95	6.30	1.17	5.38	7.21	1.23	5.85
20	5.28	1.25	4.24	6.00	1.30	4.61	6.86	1.37	5.01
25	5.03	1.38	3.63	5.71	1.45	3.95	6.54	1.52	4.29
30	4.79	1.54	3.11	5.44	1.61	3.39	6.22	1.69	3.68
35	4.56	1.71	2.67	5.18	1.79	2.90	5.93	1.88	3.16
40	4.34	1.90	2.29	4.94	1.98	2.49	5.65	2.09	2.70
45	4.14	2.11	1.96	4.70	2.20	2.13	5.38	2.32	2.32
1.Test Standard : EN14511									

Rated Cooling Capacity Curve		
Rated Input Power Curve		
Rated EER Curve		

1.2.3.2 HH-C3-8

Heating Capacity[1]												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			45			55		
	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	3.87	1.50	2.58	3.84	1.92	2.00	3.81	2.47	1.55	3.79	3.01	1.26
-20	4.45	1.53	2.91	4.42	1.96	2.25	4.39	2.52	1.74	4.36	3.07	1.42
-15	5.11	1.56	3.28	5.08	2.00	2.54	5.04	2.57	1.97	5.01	3.13	1.60
-10	5.73	1.57	3.64	5.69	2.02	2.82	5.65	2.59	2.18	5.61	3.17	1.77
-7	6.18	1.49	4.14	6.14	1.92	3.20	6.10	2.46	2.48	6.06	3.01	2.01
-2	6.68	1.42	4.71	6.63	1.82	3.64	6.59	2.34	2.82	6.55	2.86	2.29
2	7.21	1.35	5.35	7.17	1.73	4.14	7.12	2.22	3.20	7.07	2.71	2.60
7	8.30	1.29	6.41	8.24	1.66	4.96	8.18	2.13	3.84	8.13	2.61	3.12
12	8.63	1.22	7.09	8.57	1.56	5.49	8.51	2.01	4.24	8.45	2.45	3.45
20	9.15	1.10	8.35	9.08	1.41	6.46	9.02	1.81	5.00	8.96	2.20	4.06
27	9.69	0.99	9.84	9.63	1.27	7.61	9.56	1.62	5.89	9.50	1.98	4.79

1.Test Standard：EN14511

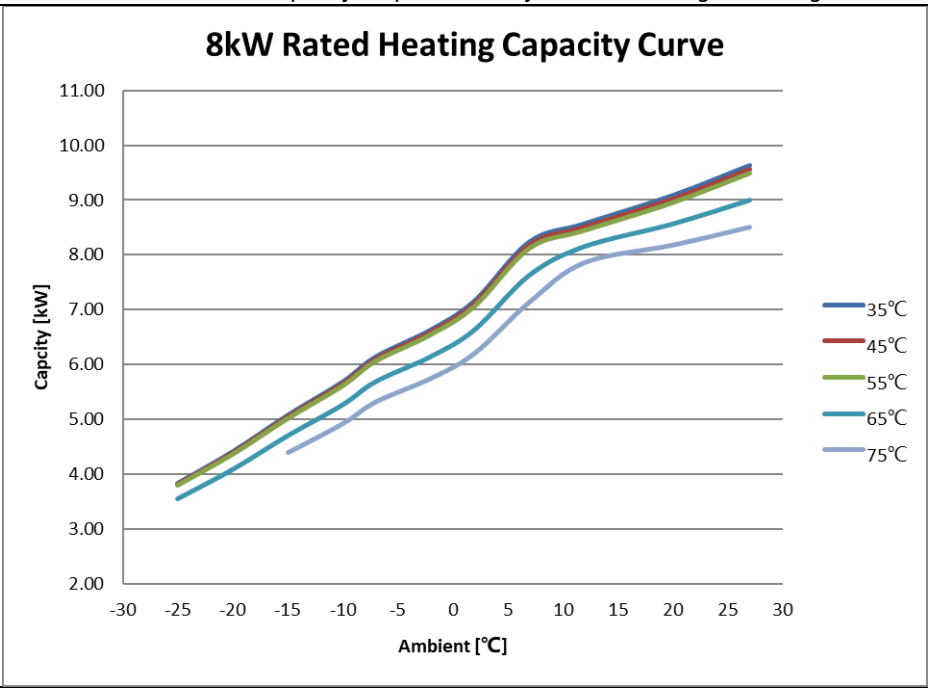
Notes：Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	60			65			70			75		
	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	3.67	3.23	1.14	3.56	3.44	1.03	/	/	/	/	/	/
-20	4.22	3.29	1.28	4.09	3.51	1.17	/	/	/	/	/	/
-15	4.86	3.36	1.45	4.71	3.58	1.31	4.55	3.80	1.20	4.40	4.03	1.09
-10	5.44	3.39	1.60	5.27	3.62	1.46	5.10	3.84	1.33	4.93	4.07	1.21
-7	5.88	3.22	1.82	5.69	3.44	1.66	5.51	3.65	1.51	5.32	3.86	1.38
-2	6.35	3.06	2.07	6.15	3.26	1.88	5.95	3.47	1.72	5.75	3.67	1.57
2	6.85	2.91	2.36	6.64	3.10	2.14	6.43	3.29	1.95	6.21	3.49	1.78
7	7.88	2.79	2.82	7.64	2.98	2.57	7.39	3.16	2.34	7.14	3.35	2.13
12	8.30	2.62	3.17	8.16	2.80	2.91	8.01	2.97	2.69	7.86	3.15	2.50
20	8.76	2.36	3.71	8.57	2.52	3.40	8.37	2.67	3.13	8.17	2.83	2.89
27	9.25	2.13	4.35	9.00	2.27	3.97	8.75	2.41	3.63	8.50	2.55	3.33

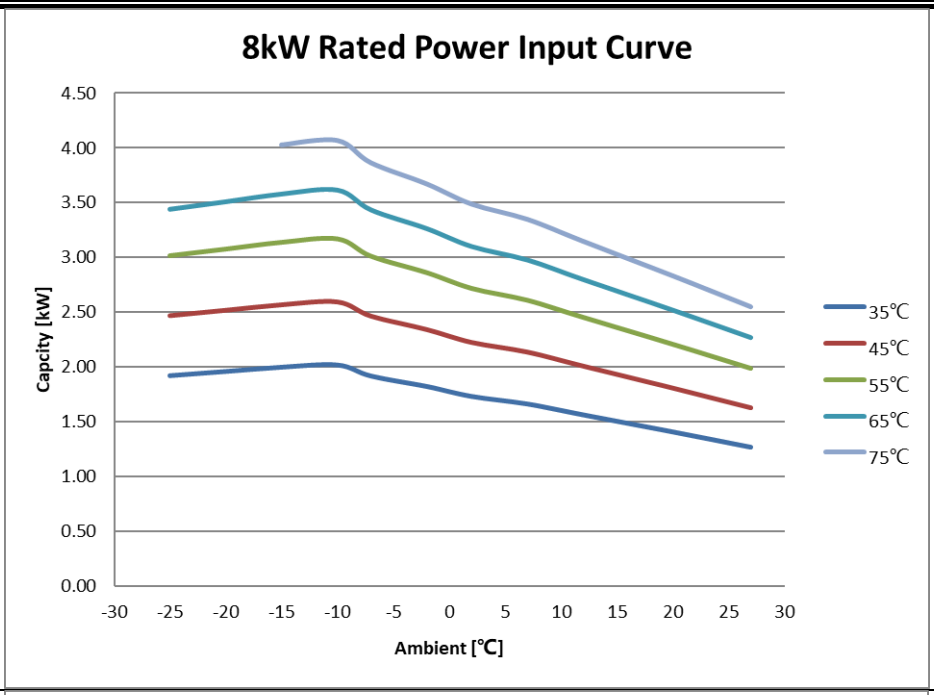
1.Test Standard：EN14511

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

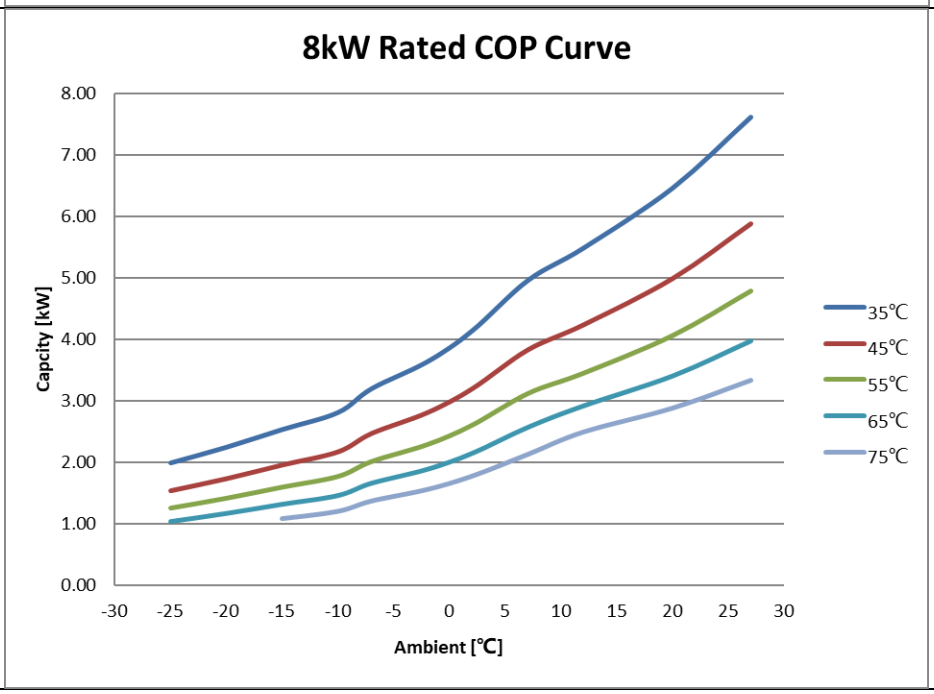
Rated Heating Capacity Curve



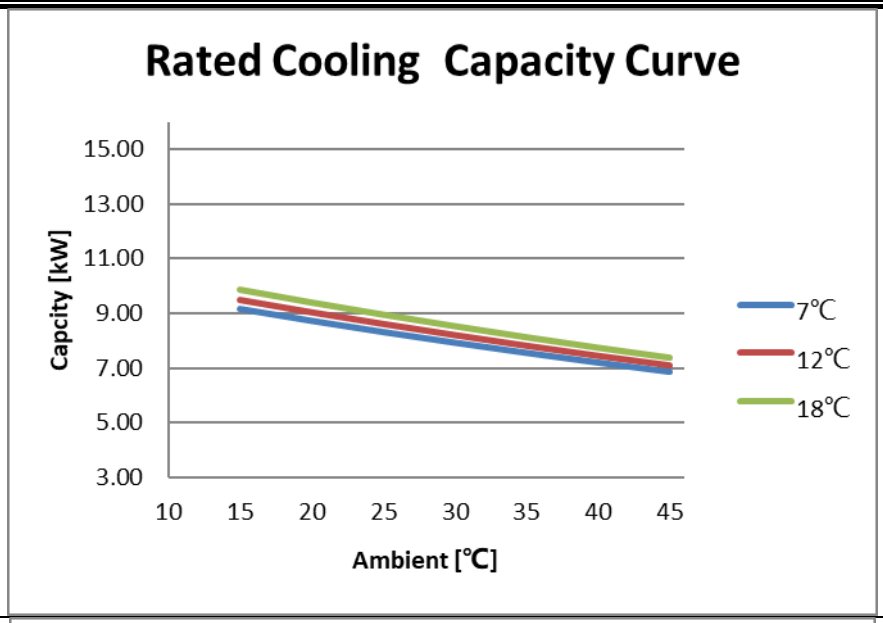
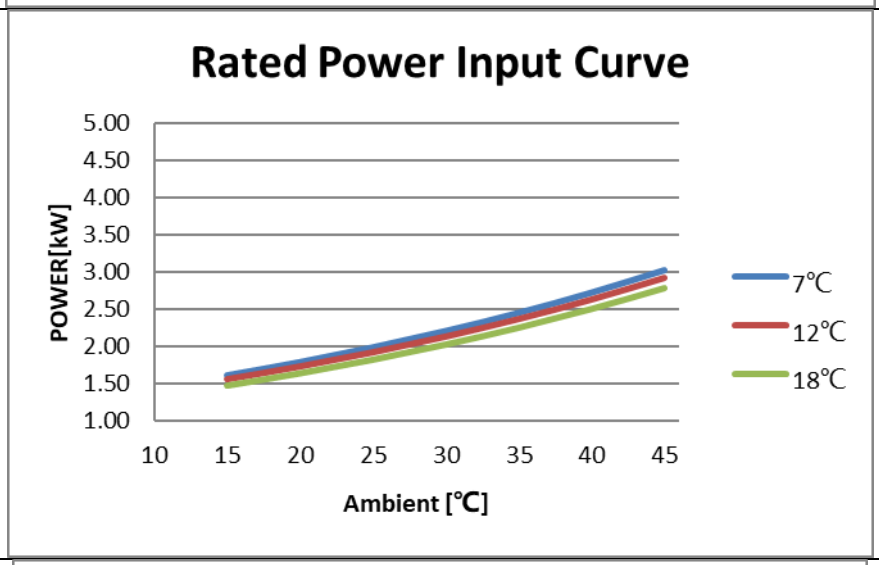
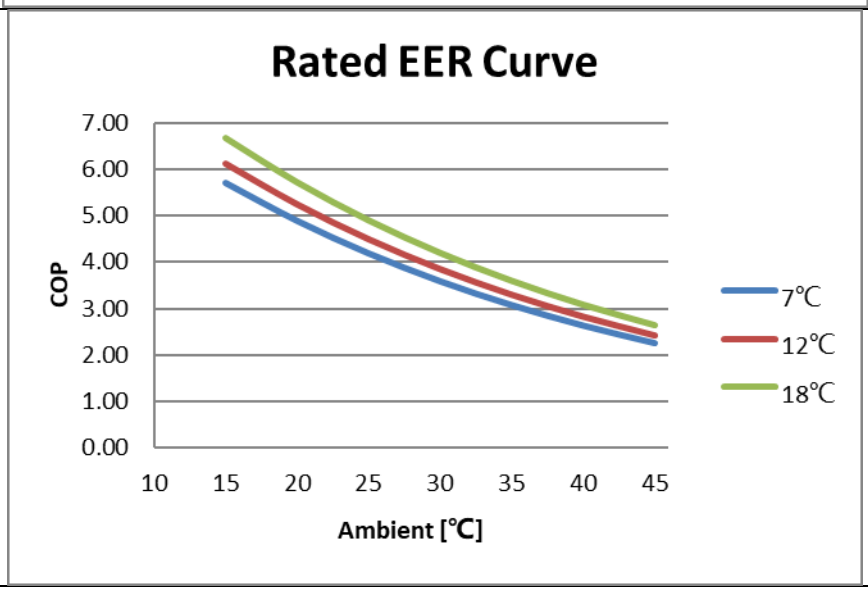
Rated Input Power Curve



Rated COP Curve



Cooling Capacity[1]									
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	9.18	1.61	5.71	9.49	1.55	6.13	9.86	1.48	6.68
20	8.74	1.79	4.89	9.04	1.72	5.25	9.39	1.64	5.73
25	8.32	1.98	4.19	8.61	1.91	4.50	8.94	1.82	4.91
30	7.93	2.21	3.60	8.20	2.12	3.86	8.52	2.03	4.21
35	7.55	2.45	3.08	7.81	2.36	3.31	8.11	2.25	3.61
40	7.19	2.72	2.64	7.43	2.62	2.84	7.73	2.50	3.09
45	6.85	3.02	2.26	7.08	2.91	2.43	7.36	2.78	2.65
1.Test Standard : EN14511									

Rated Cooling Capacity Curve		
Rated Input Power Curve		
Rated EER Curve		

1.2.3.3 HH-C3-12

Heating Capacity[1]												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			45			55		
	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	5.58	2.37	2.35	5.61	3.02	1.86	5.65	3.85	1.47	5.68	4.67	1.21
-20	6.42	2.42	2.65	6.46	3.08	2.09	6.49	3.92	1.65	6.53	4.77	1.37
-15	7.38	2.47	2.99	7.42	3.14	2.36	7.47	4.00	1.86	7.51	4.86	1.54
-10	8.27	2.49	3.31	8.31	3.18	2.62	8.36	4.04	2.07	8.41	4.91	1.71
-7	8.93	2.37	3.77	8.98	3.02	2.98	9.03	3.84	2.35	9.08	4.67	1.95
-2	9.64	2.25	4.28	9.70	2.87	3.38	9.75	3.65	2.67	9.81	4.43	2.21
2	10.41	2.14	4.87	10.47	2.72	3.85	10.53	3.47	3.04	10.59	4.21	2.52
7	11.98	2.05	5.83	12.05	2.61	4.61	12.11	3.33	3.64	12.18	4.04	3.01
12	12.46	1.93	6.45	12.53	2.46	5.10	12.60	3.13	4.03	12.67	3.80	3.33
20	13.20	1.74	7.60	13.28	2.21	6.00	13.35	2.82	4.74	13.43	3.42	3.93
27	14.00	1.56	8.95	14.08	1.99	7.07	14.16	2.53	5.59	14.24	3.08	4.63

1.Test Standard：EN14511

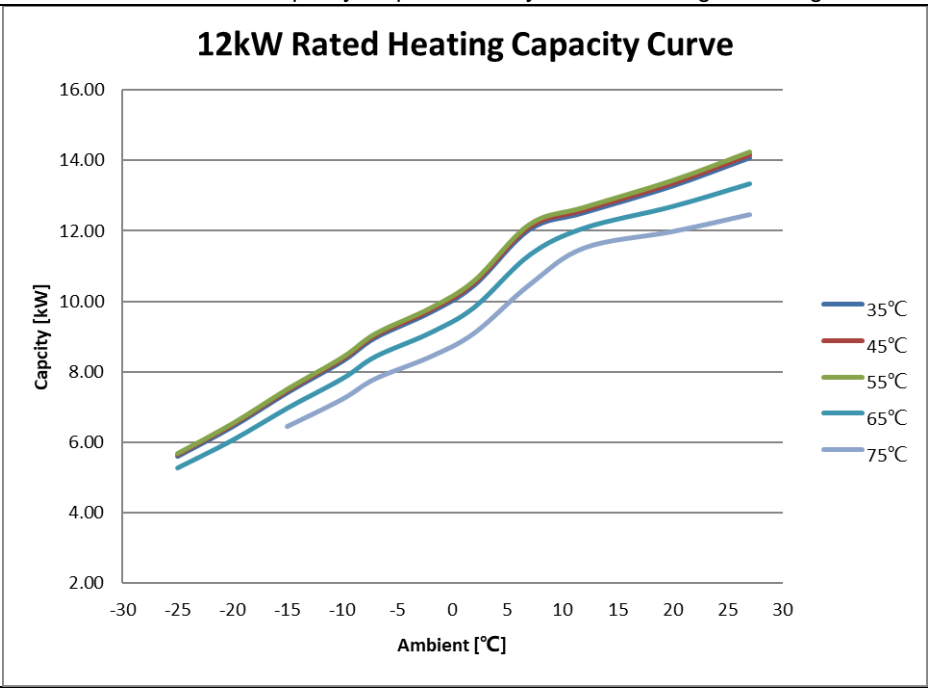
Notes：Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

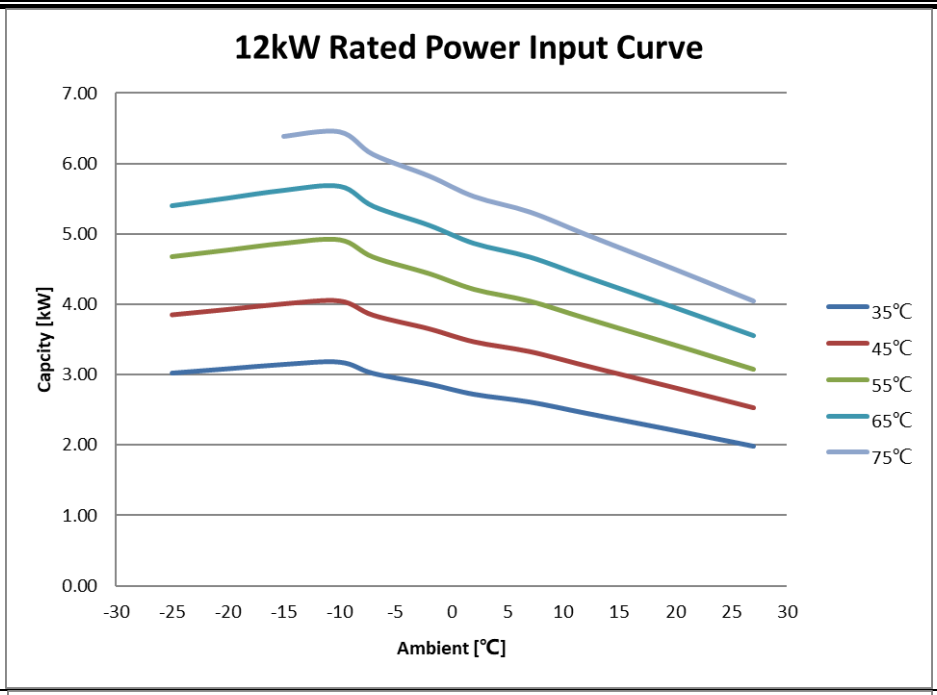
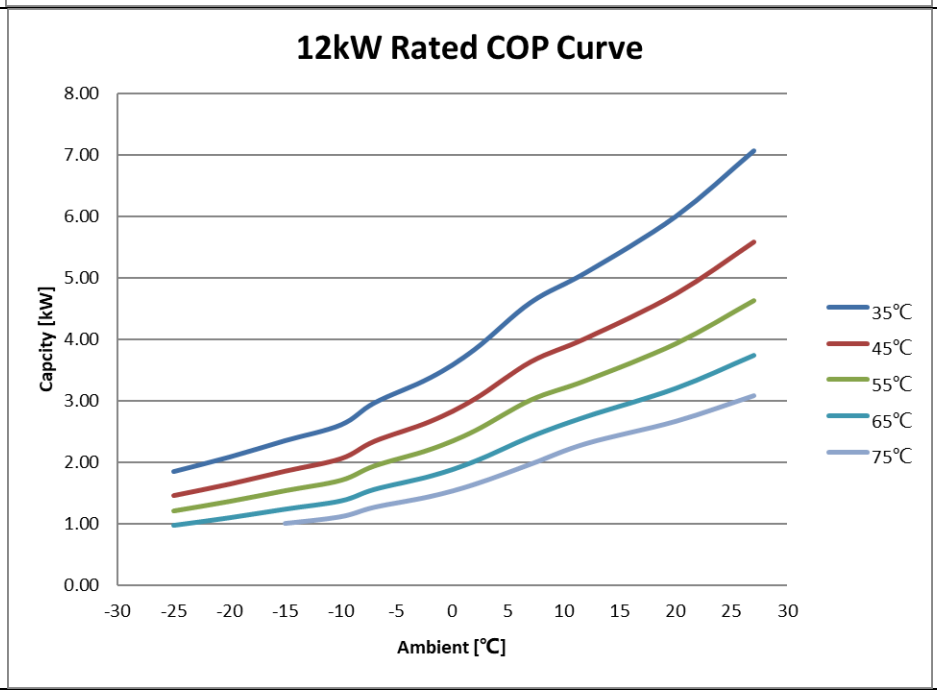
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	60			65			70			75		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	5.48	5.04	1.09	5.28	5.41	0.98	/	/	/	/	/	/
-20	6.30	5.14	1.23	6.07	5.51	1.10	/	/	/	/	/	/
-15	7.24	5.24	1.38	6.98	5.63	1.24	6.71	6.01	1.12	6.45	6.39	1.01
-10	8.11	5.30	1.53	7.82	5.68	1.38	7.52	6.07	1.24	7.22	6.45	1.12
-7	8.76	5.03	1.74	8.44	5.40	1.56	8.12	5.76	1.41	7.80	6.13	1.27
-2	9.46	4.78	1.98	9.12	5.13	1.78	8.77	5.48	1.60	8.43	5.82	1.45
2	10.22	4.54	2.25	9.85	4.87	2.02	9.47	5.20	1.82	9.10	5.53	1.65
7	11.75	4.36	2.70	11.32	4.68	2.42	10.89	4.99	2.18	10.47	5.31	1.97
12	12.38	4.10	3.02	12.09	4.40	2.75	11.80	4.69	2.51	11.51	4.99	2.31
20	13.07	3.69	3.54	12.70	3.96	3.21	12.34	4.22	2.92	11.97	4.49	2.66
27	13.79	3.32	4.15	13.34	3.56	3.75	12.90	3.80	3.39	12.45	4.04	3.08

1.Test Standard：EN14511

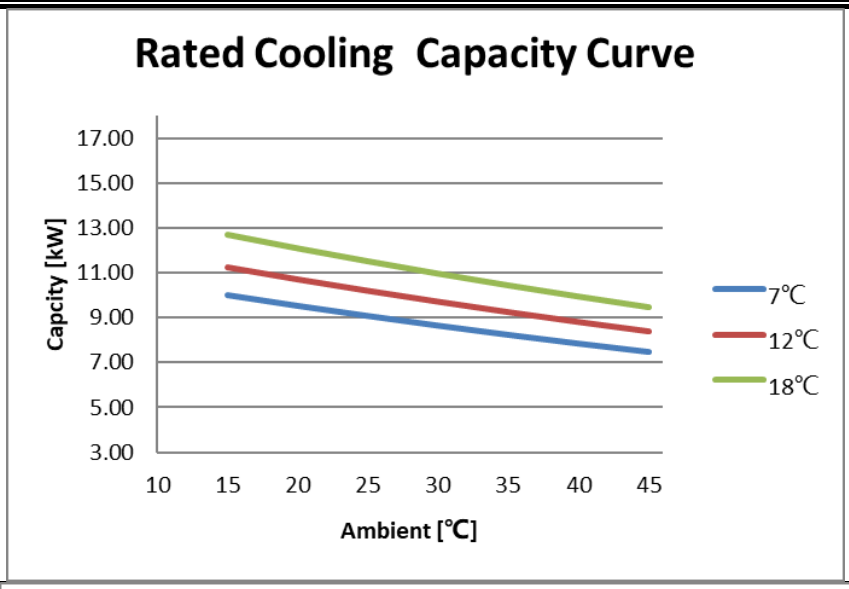
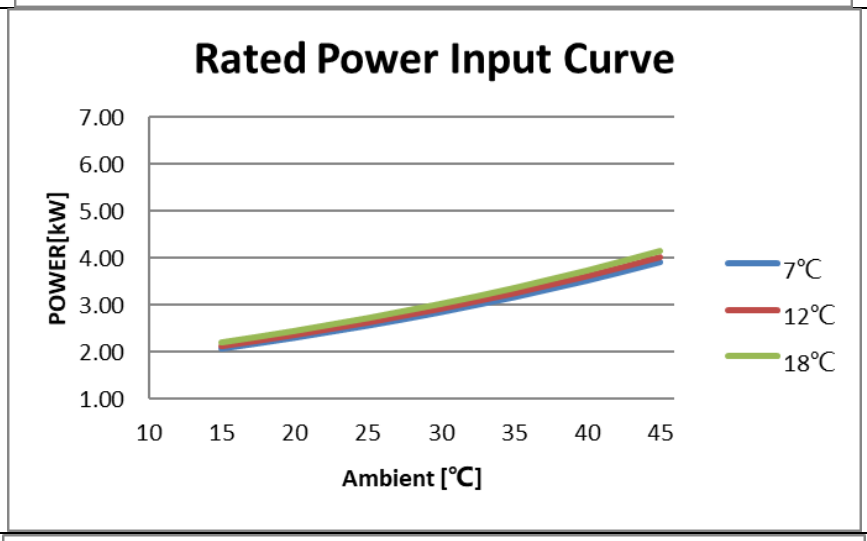
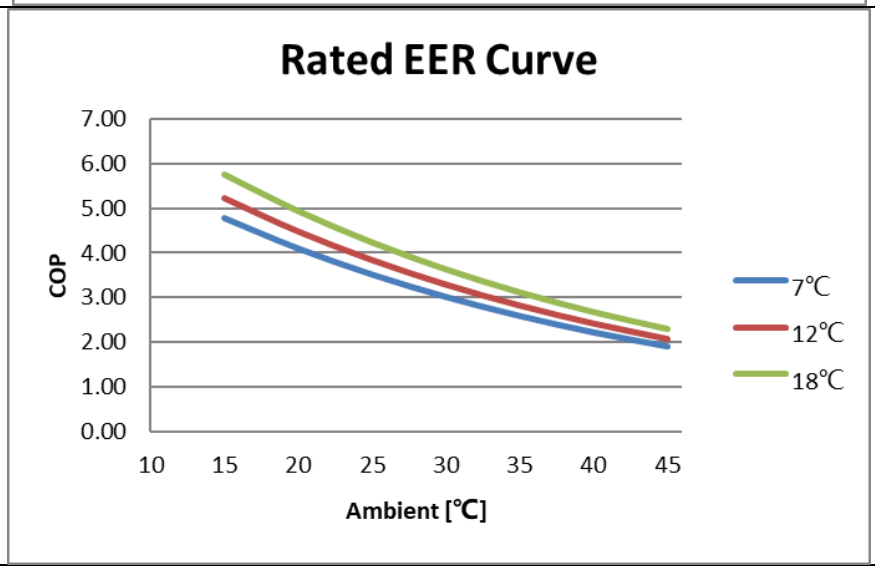
Notes：Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

Rated Heating Capacity Curve



Rated Input Power Curve		
Rated COP Curve		

Cooling Capacity[1]									
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	10.00	2.09	4.79	11.22	2.14	5.24	12.67	2.21	5.74
20	9.53	2.32	4.11	10.68	2.38	4.49	12.07	2.45	4.92
25	9.07	2.58	3.52	10.18	2.64	3.85	11.50	2.72	4.22
30	8.64	2.87	3.02	9.69	2.94	3.30	10.95	3.03	3.62
35	8.23	3.18	2.59	9.23	3.27	2.83	10.43	3.36	3.10
40	7.84	3.54	2.22	8.79	3.63	2.42	9.93	3.74	2.66
45	7.47	3.93	1.90	8.37	4.03	2.08	9.46	4.15	2.28
1.Test Standard：EN14511									

Rated Cooling Capacity Curve		
Rated Input Power Curve		
Rated EER Curve		

1.2.3.4 HH-C3-18

Heating Capacity[1]												
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	25			35			45			55		
	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	8.40	3.86	2.18	8.39	4.74	1.77	8.39	5.82	1.44	8.39	6.90	1.22
-20	9.66	3.93	2.45	9.65	4.83	2.00	9.65	5.93	1.63	9.65	7.03	1.37
-15	11.10	4.01	2.77	11.10	4.93	2.25	11.10	6.05	1.83	11.09	7.17	1.55
-10	12.44	4.05	3.07	12.43	4.98	2.50	12.43	6.11	2.03	12.42	7.25	1.71
-7	13.43	3.85	3.49	13.43	4.73	2.84	13.42	5.81	2.31	13.42	6.88	1.95
-2	14.51	3.66	3.97	14.50	4.49	3.23	14.50	5.52	2.63	14.49	6.54	2.22
2	15.67	3.47	4.51	15.66	4.27	3.67	15.66	5.24	2.99	15.65	6.21	2.52
7	18.02	3.34	5.40	18.01	4.10	4.40	18.00	5.03	3.58	18.00	5.96	3.02
12	18.74	3.14	5.98	18.73	3.85	4.86	18.72	4.73	3.96	18.72	5.61	3.34
20	19.86	2.82	7.04	19.85	3.47	5.73	19.85	4.26	4.66	19.84	5.05	3.93
27	21.05	2.54	8.29	21.05	3.12	6.75	21.04	3.83	5.49	21.03	4.54	4.63

1.Test Standard：EN14511

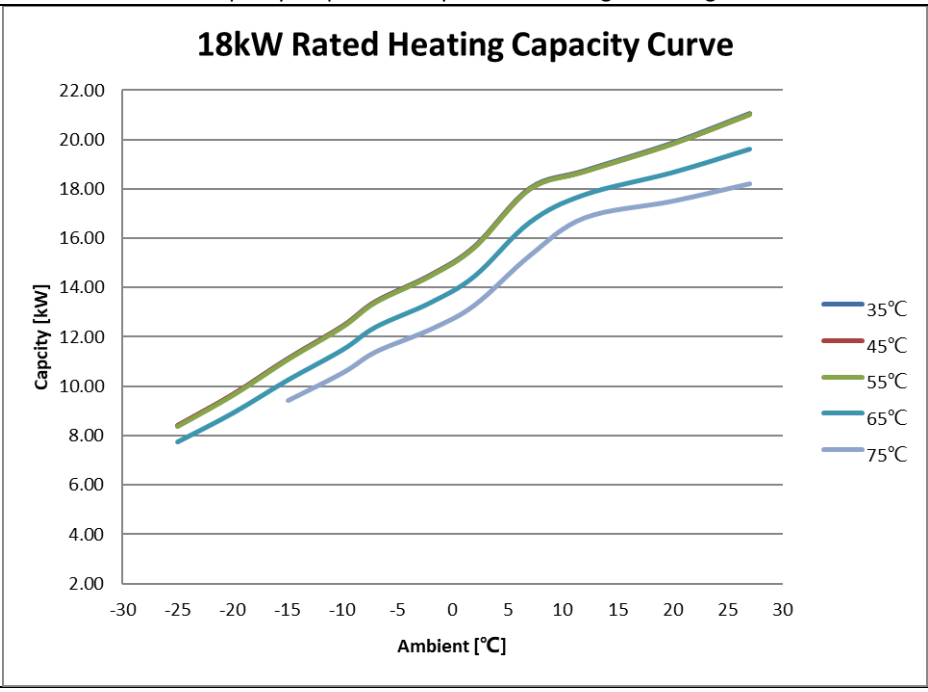
Notes：Peak heating capacity values do not take account of capacity drops caused by frost and during defrosting.

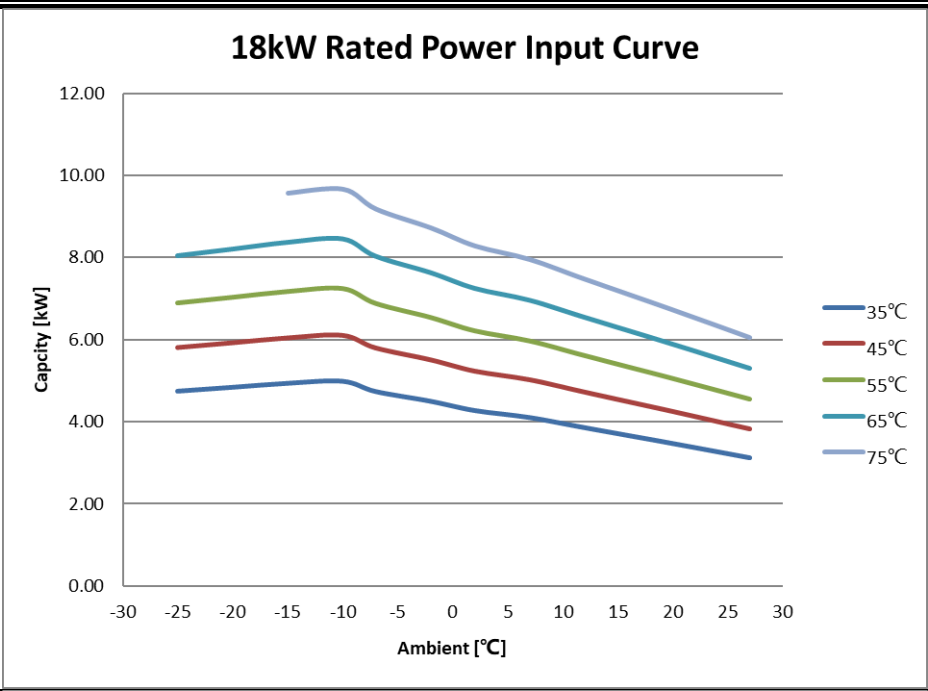
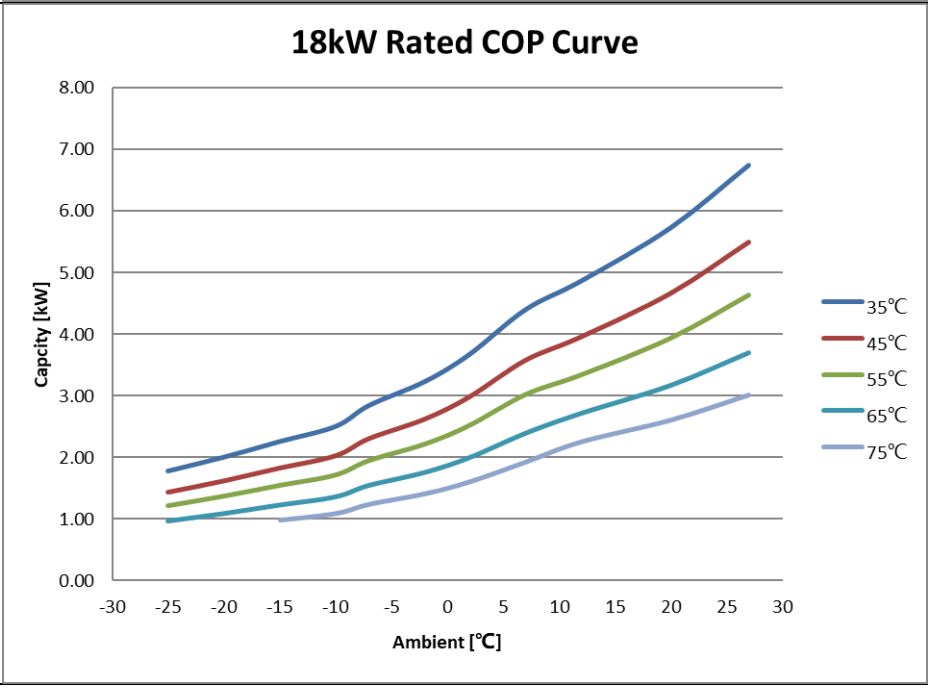
Ambient Temperature (°C)	Water Outlet Temperature(°C)											
	60			65			70			75		
	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP	Heating Capacity (kW)	Power Input (kW)	COP
-25	8.07	7.47	1.08	7.76	8.04	0.96	/	/	/	/	/	/
-20	9.29	7.62	1.22	8.93	8.21	1.09	/	/	/	/	/	/
-15	10.68	7.77	1.37	10.27	8.37	1.23	9.85	8.97	1.10	9.44	9.57	0.99
-10	11.96	7.85	1.52	11.50	8.45	1.36	11.03	9.06	1.22	10.57	9.66	1.09
-7	12.92	7.46	1.73	12.42	8.03	1.55	11.92	8.60	1.38	11.42	9.18	1.24
-2	13.95	7.08	1.97	13.41	7.63	1.76	12.87	8.17	1.57	12.33	8.72	1.41
2	15.07	6.73	2.24	14.48	7.25	2.00	13.90	7.77	1.79	13.32	8.28	1.61
7	17.33	6.46	2.68	16.66	6.96	2.39	15.98	7.46	2.14	15.31	7.95	1.93
12	18.25	6.07	3.00	17.78	6.54	2.72	17.31	7.01	2.47	16.85	7.47	2.25
20	19.26	5.47	3.52	18.68	5.89	3.17	18.10	6.31	2.87	17.52	6.73	2.60
27	20.33	4.92	4.13	19.62	5.30	3.70	18.92	5.68	3.33	18.22	6.05	3.01

1.Test Standard：EN14511

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

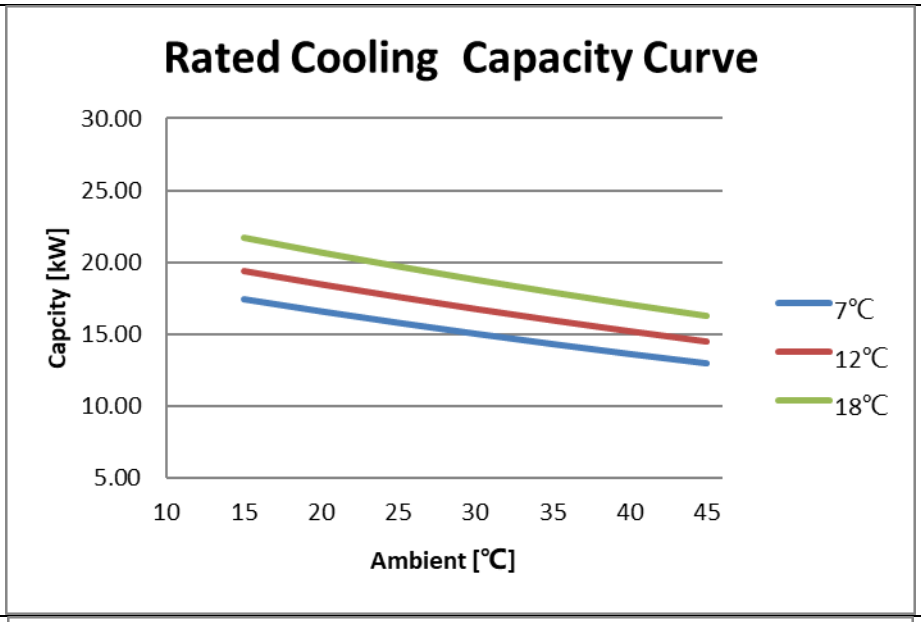
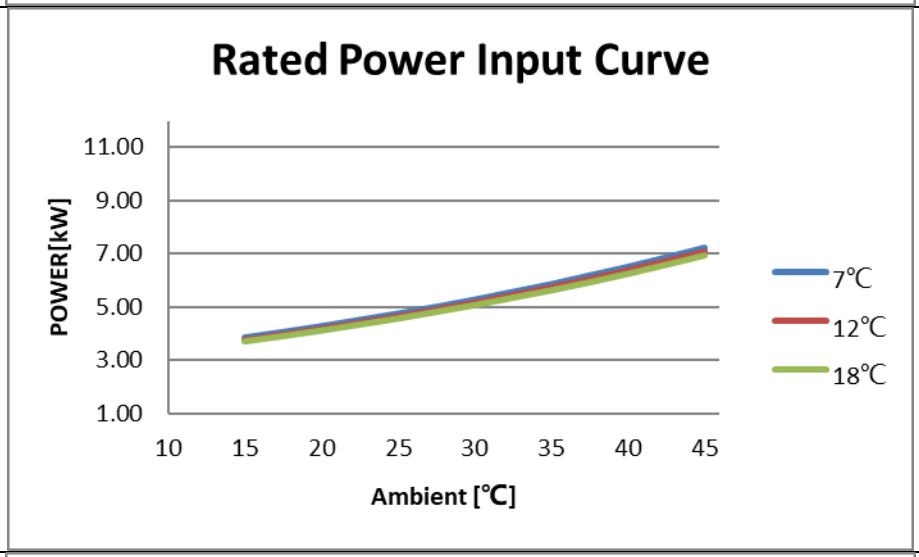
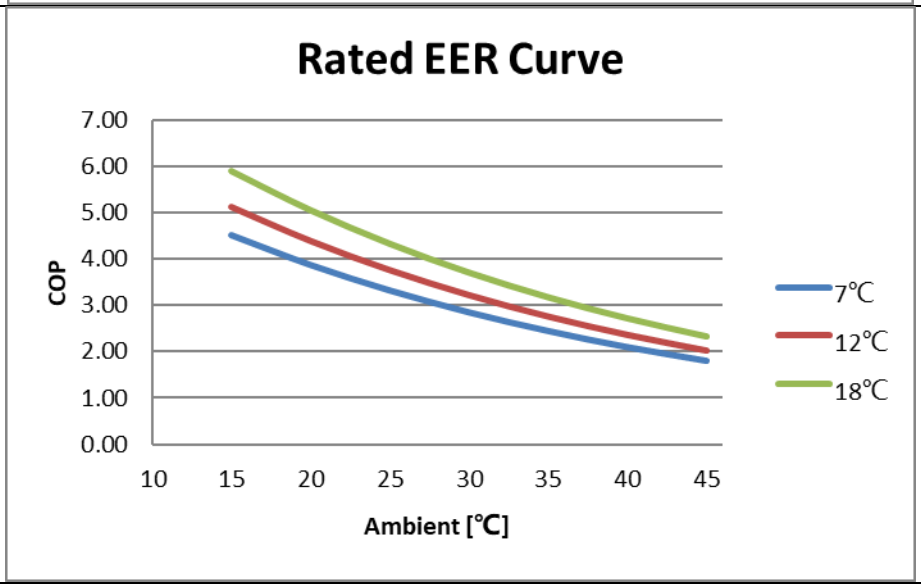
Rated Heating Capacity Curve



Rated Input Power Curve			
Rated COP Curve			

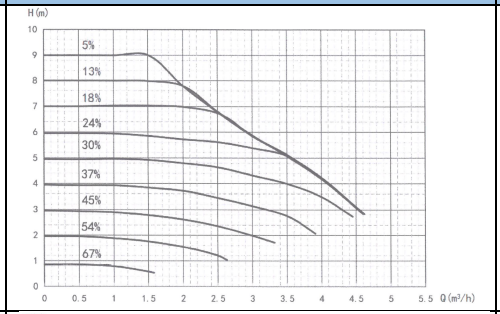
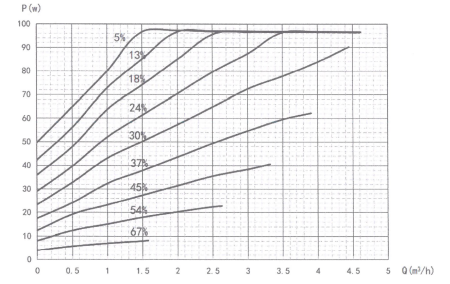
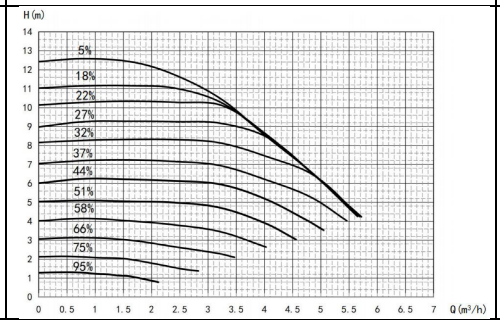
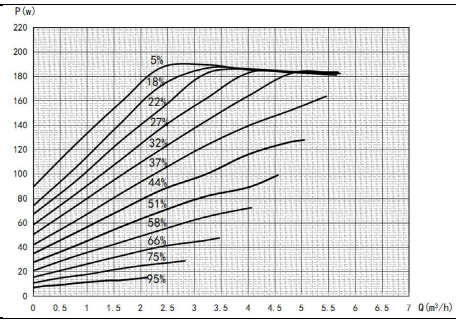
Cooling Capacity[1]									
Ambient Temperature(°C)	Water Outlet Temperature(°C)								
	7			12			18		
	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER	Cooling Capacity(kW)	Power Input(kW)	EER
15	17.40	3.85	4.52	19.37	3.78	5.13	21.74	3.69	5.89
20	16.57	4.27	3.88	18.45	4.20	4.40	20.71	4.10	5.05
25	15.78	4.75	3.32	17.57	4.66	3.77	19.72	4.56	4.32
30	15.03	5.28	2.85	16.74	5.18	3.23	18.78	5.07	3.71
35	14.32	5.86	2.44	15.94	5.76	2.77	17.89	5.63	3.18
40	13.63	6.51	2.09	15.18	6.40	2.37	17.04	6.26	2.72
45	12.99	7.24	1.79	14.46	7.11	2.03	16.22	6.95	2.33

1.Test Standard：EN14511

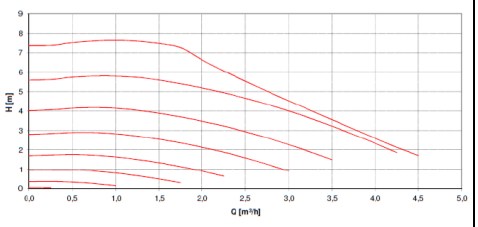
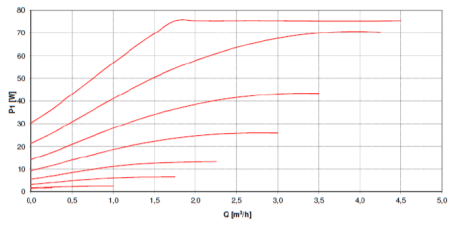
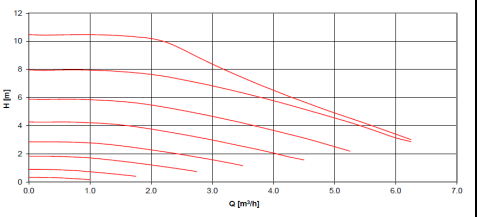
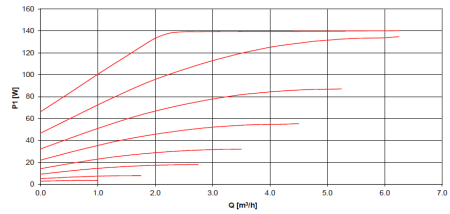
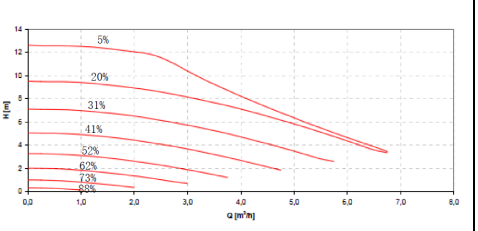
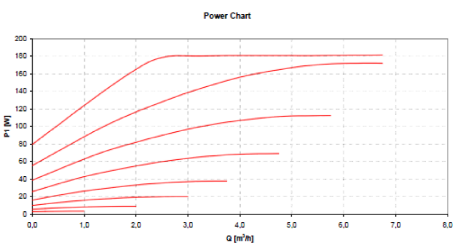
Rated Cooling Capacity Curve		
Rated Input Power Curve		
Rated EER Curve		

1.2.4 Water Pump Performance

1.2.4.1SHIMGE

Model		Performance Curve	
Unit	Water Pump	H-Q	P-Q
HH-C1-6 HH-C1-8 HH-C3-8 HH-C1-12 HH-C3-12	APM25-9-130		
HH-C1-18 HH-C3-18	APF25-12-130EFPWM1		

1.2.4.2 GRUNDFOS

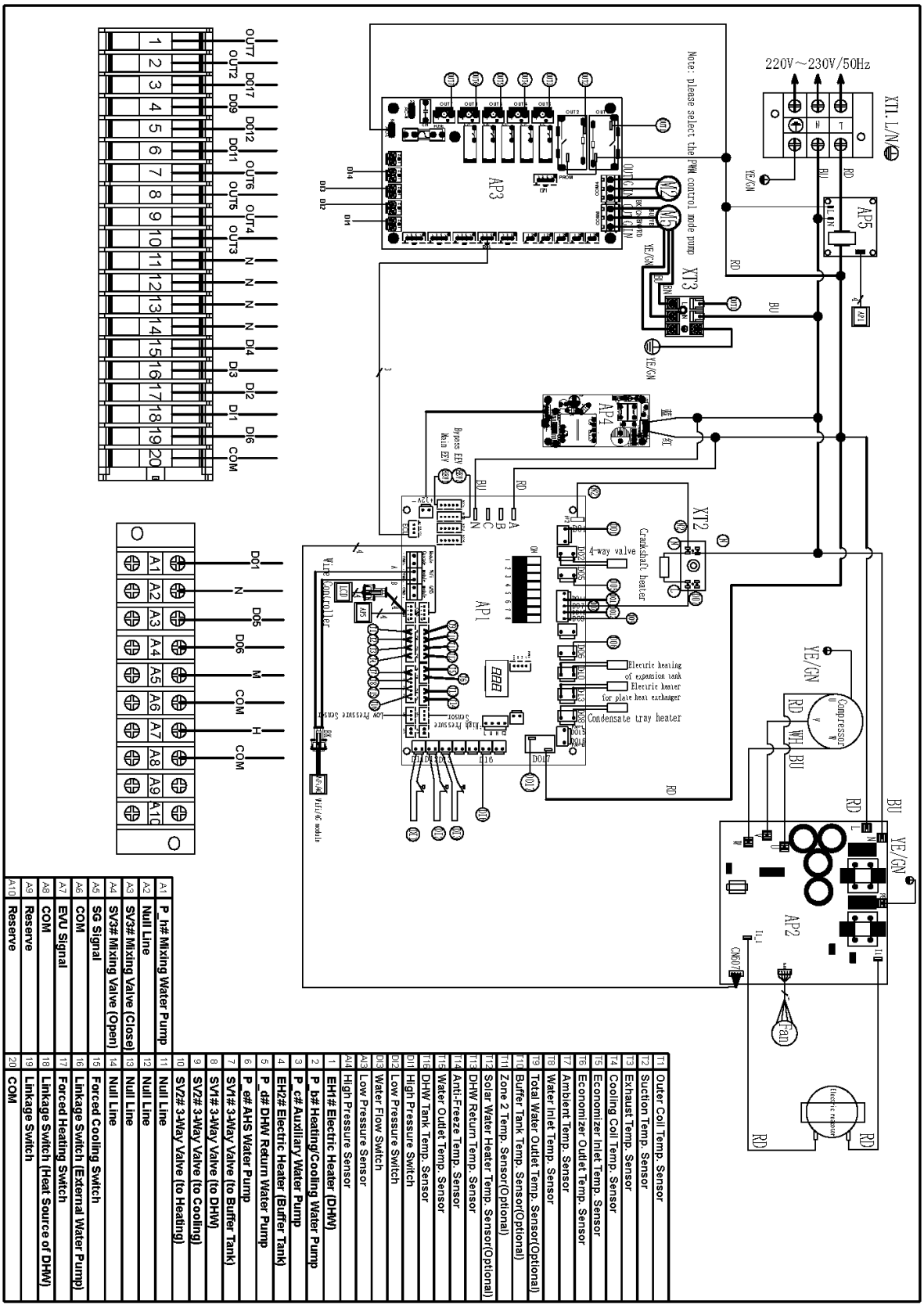
Model		Performance Curve	
Unit	Water Pump	H-Q	P-Q
HH-C1-6	UPM3K/25-75/130		
HH-C1-8 HH-C3-8 HH-C1-12 HH-C3-12	UPML/25-105/130		
HH-C1-18 HH-C3-18	UPMXL/25-125/130		

1.3 Unit Electrical Information

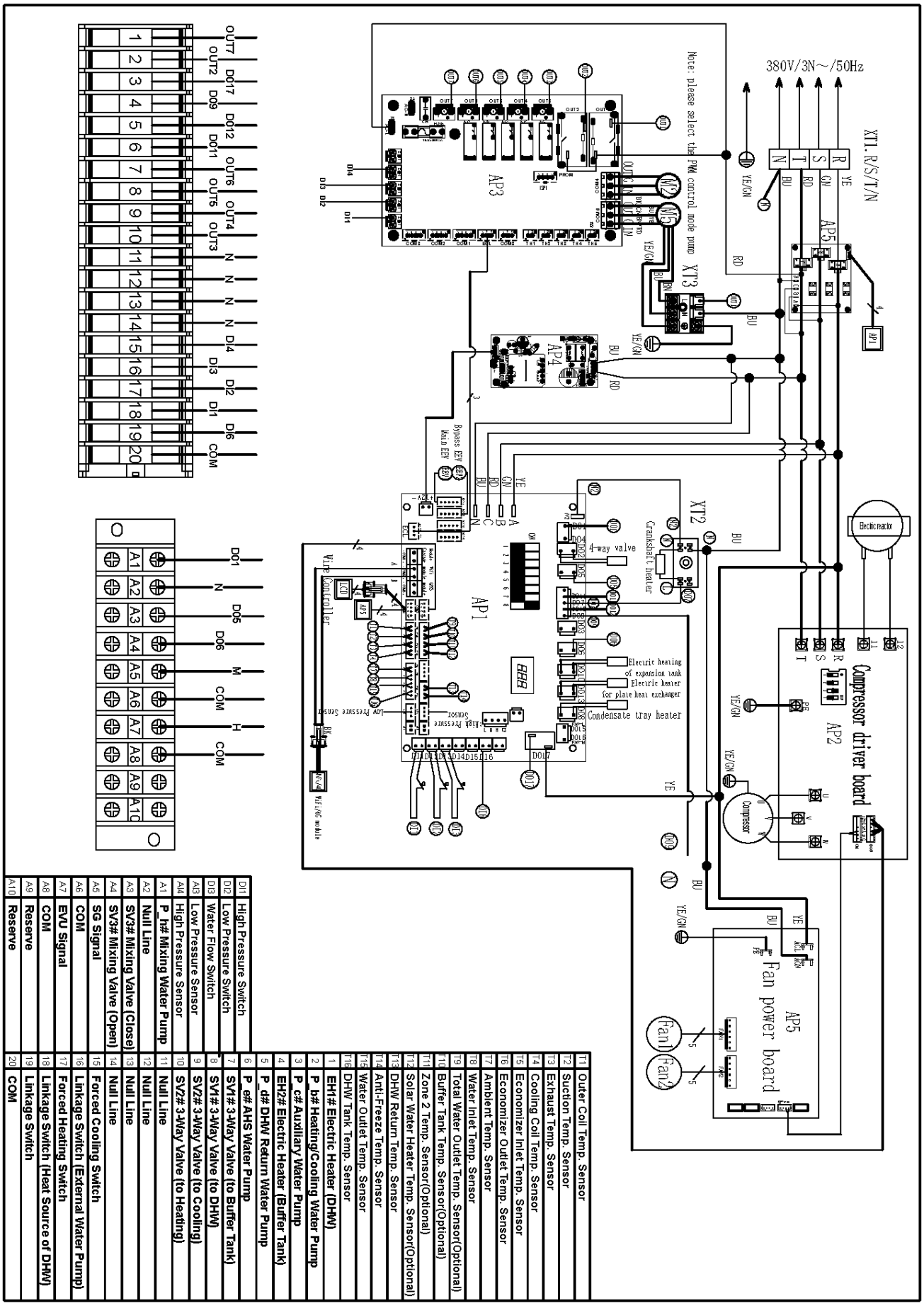
This section only consolidates the latest version of electrical information. Refer to Appendix 4.5 for information from other versions.

1.3.1 Wire Diagram

1.3.1.1 HH-C1-6



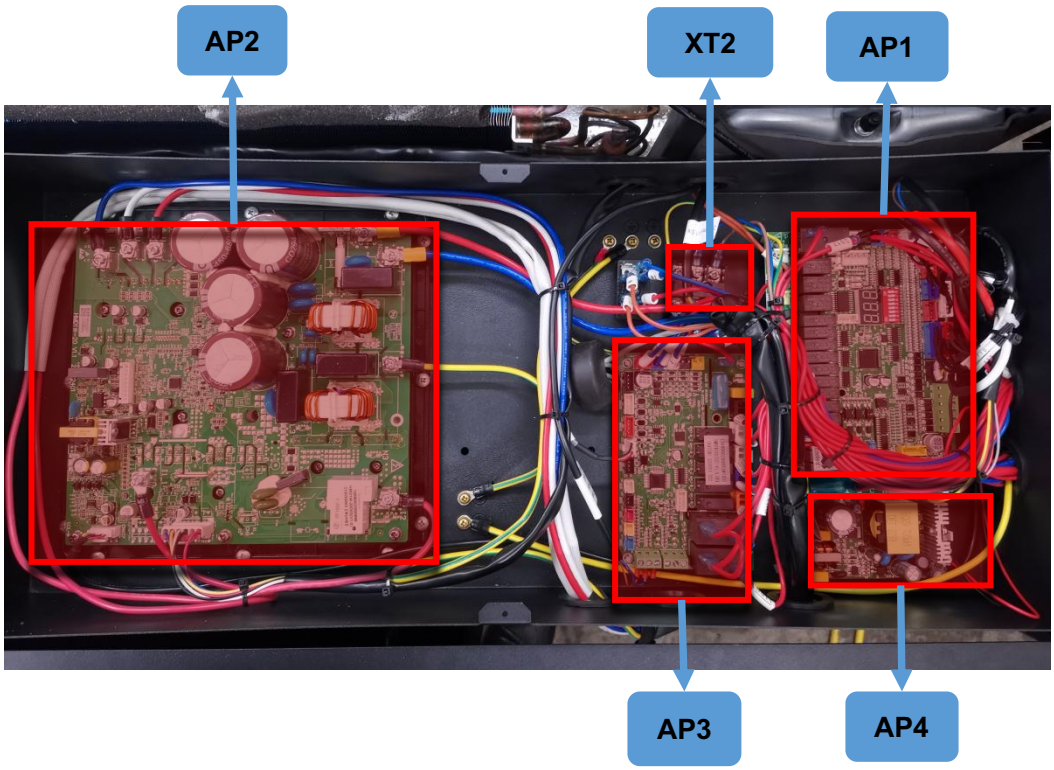
1.3.1.2 HH-C3-8/HH-C3-12/HH-C3-18



DI1	High Pressure Switch	T1 Outer Coil Temp. Sensor
DI2	Low Pressure Switch	T2 Suction Temp. Sensor
DI3	Water Flow Switch	T3 Exhaust Temp. Sensor
AI3	Low Pressure Sensor	T4 Cooling Coil Temp. Sensor
AI4	High Pressure Sensor	T5 Economizer Inlet Temp. Sensor
A1	P_h# Mixing Water Pump	T6 Economizer Outlet Temp. Sensor
A2	Null Line	T7 Ambient Temp. Sensor
A3	SV3# Mixing Valve (Close)	T8 Water Inlet Temp. Sensor
A4	SV3# Mixing Valve (Open)	T9 Total Water Outlet Temp. Sensor(Optional)
A5	SG Signal	T10 Buffer Tank Temp. Sensor(Optional)
A6	COM	T11 Zone 2 Temp. Sensor(Optional)
A7	EVU Signal	T12 Solar Water Heater Temp. Sensor(Optional)
A8	COM	T13 DHW Return Temp. Sensor
A9	Reserve	T14 Anti-Freeze Temp. Sensor
A10	Reserve	T15 Water Outlet Temp. Sensor
		T16 DHW Tank Temp. Sensor
DI1	High Pressure Switch	1 EH1# Electric Heater (DHW)
DI2	Low Pressure Switch	2 P_b# Heating/Cooling Water Pump
DI3	Water Flow Switch	3 P_c# Auxiliary Water Pump
AI3	Low Pressure Sensor	4 EH2# Electric Heater (Buffer Tank)
AI4	High Pressure Sensor	5 P_d# DHW Return Water Pump
A1	P_h# Mixing Water Pump	6 P_e# AHS Water Pump
A2	Null Line	7 SV1# 3-Way Valve (to Buffer Tank)
A3	SV3# Mixing Valve (Close)	8 SV1# 3-Way Valve (to DHW)
A4	SV3# Mixing Valve (Open)	9 SV2# 3-Way Valve (to Cooling)
A5	SG Signal	10 SV2# 3-Way Valve (to Heating)
A6	COM	11 Null Line
A7	EVU Signal	12 Null Line
A8	COM	13 Null Line
A9	Reserve	14 Null Line
A10	Reserve	15 Forced Cooling Switch
		16 Linkage Switch (External Water Pump)
		17 Forced Heating Switch
		18 Linkage Switch (Heat Source of DHW)
		19 Linkage Switch
		20 COM

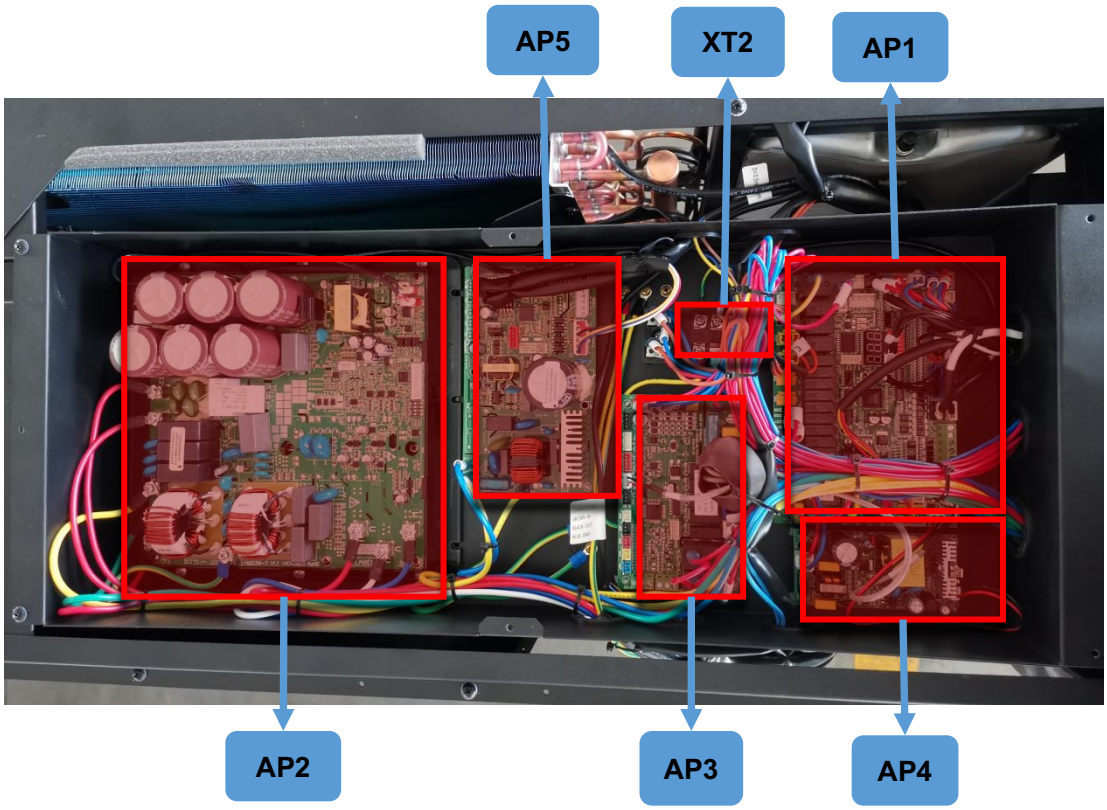
1.3.2 Electrical Layout

1.3.2.1 HH-C1-6



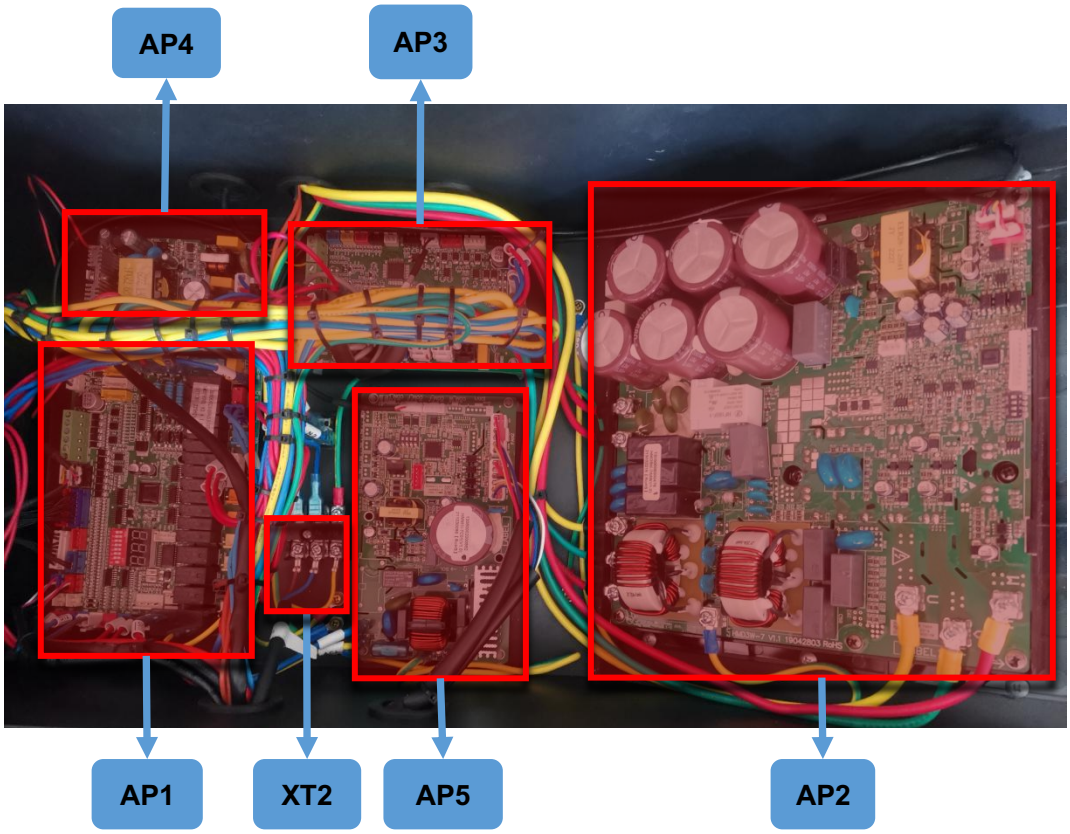
No.	Description
XT2	Water Pump Terminals (VAC230)
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board

1.3.2.2 HH-C3-8/HH-C3-12



No.	Description
XT2	Water Pump Terminals (VAC230)
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board
AP5	Fan Driver Board

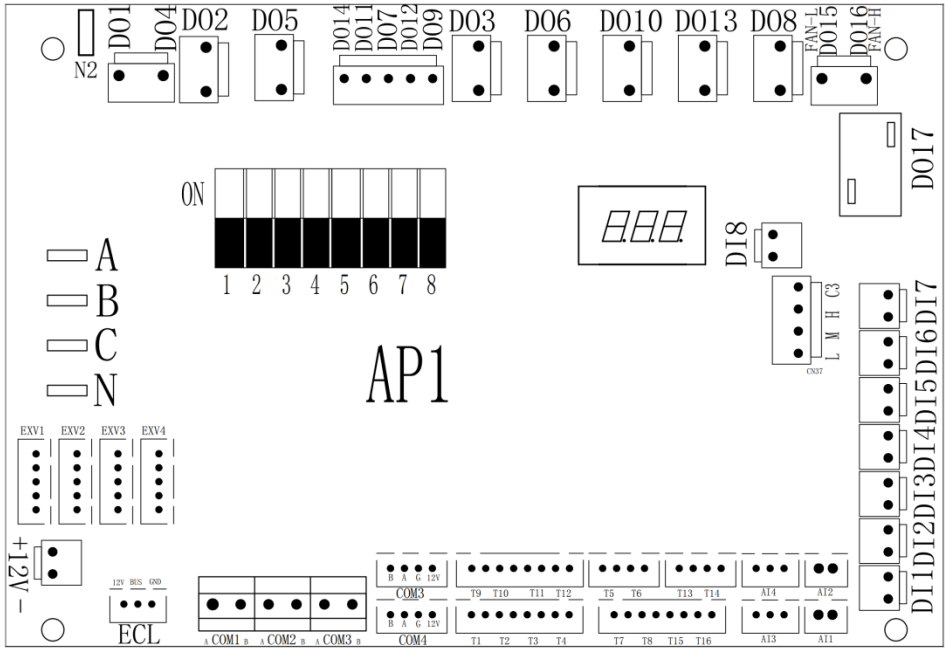
1.3.2.4 HH-C3-18



No.	Description
XT2	Water Pump Terminals (VAC230)
AP1	Motherboard
AP2	Compressor Driver Board
AP3	Water Pump Expansion Board
AP4	Power Supply Board
AP5	Fan Driver Board

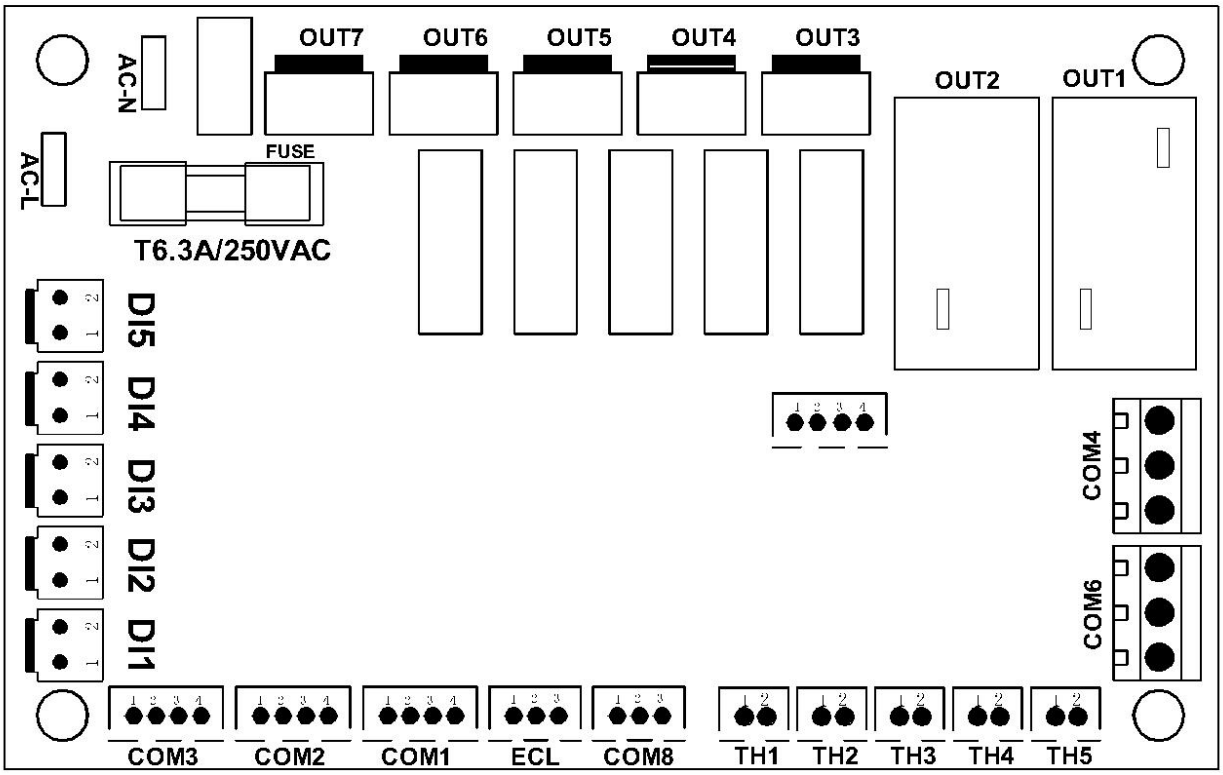
1.3.3 Motherboard Port Definition

1.3.3.1 AP1- Motherboards



Port	Description	Port	Description	Port	Description
D01	P_h：Zone 2Water Pump	DI3	Water Flow Switch	AI3	Low Pressure Sensor
D02	4-Way Valve	DI2	Low Pressure Switch	T1	Outer Coil Temp. Sensor
D03	Injection Valve	DI1	High Pressure Switch	T2	Suction Temp. Sensor
D04	Bypass Valve	C3	COM	T3	Exhaust Temp. Sensor
D05	SV3#Mixing Valve (Close)	H	SG Signal	T4	Cooling Coil Temp. Sensor
D06	SV3# Mixing Valve (Open)	M	EVU Signal	T5	Economizer Inlet Temp. Sensor
D07	Crankshaft Heater	L	Reserve	T6	Economizer Outlet Temp. Sensor
D08	Chassis Heater	AI2	Reserve	T7	Ambient Temp. Sensor
D09	EH2# Electric Heater (Buffer Tank)	AI1	Reserve	T8	Water Inlet Temp. Sensor
D010	EH3#: Electric Heater (Expansion Tank)	AI4	High Pressure Sensor	T9	Total Water Outlet Temp. Sensor
D011	P_e# AHS Water Pump	COM3	Driver Module	T10	Buffer Tank Temp. Sensor
D012	P_d# DHW Return Water Pump	COM4	Wire Controller	T11	Zone 2 Temp. Sensor
D013	EH4#: Electric Heater (Plate Heat Exchanger)	COM3	Reserve	T12	Solar Water Heater Temp. Sensor
D014	EVI Valve	COM2	Host Unit Monitor	T13	DHW Return Temp. Sensor
D015	Fan Low Wind	COM1	Cascade Module	T14	Anti-Freeze Temp. Sensor
D016	Fan High Wind	ECL	Expansion Module	T15	Water Outlet Temp. Sensor
D017	P_c# Auxiliary Water Pump	12V	DC 12V	T16	DHW Tank Temp. Sensor
C2	COM 1	EXV1	Main EEV	LED1	Digital Tube
C1	COM 2	EXV2	EVI EEV	SW1	DIP Switch
DI8	Middle Pressure Switch 1	C	Power Input T	N	Null Line
DI7	Reserve	B	Power Input S		
DI6	Linkage Switch	A	Power Input R		

1.3.3.2 AP3- Water Pump Expansion Board

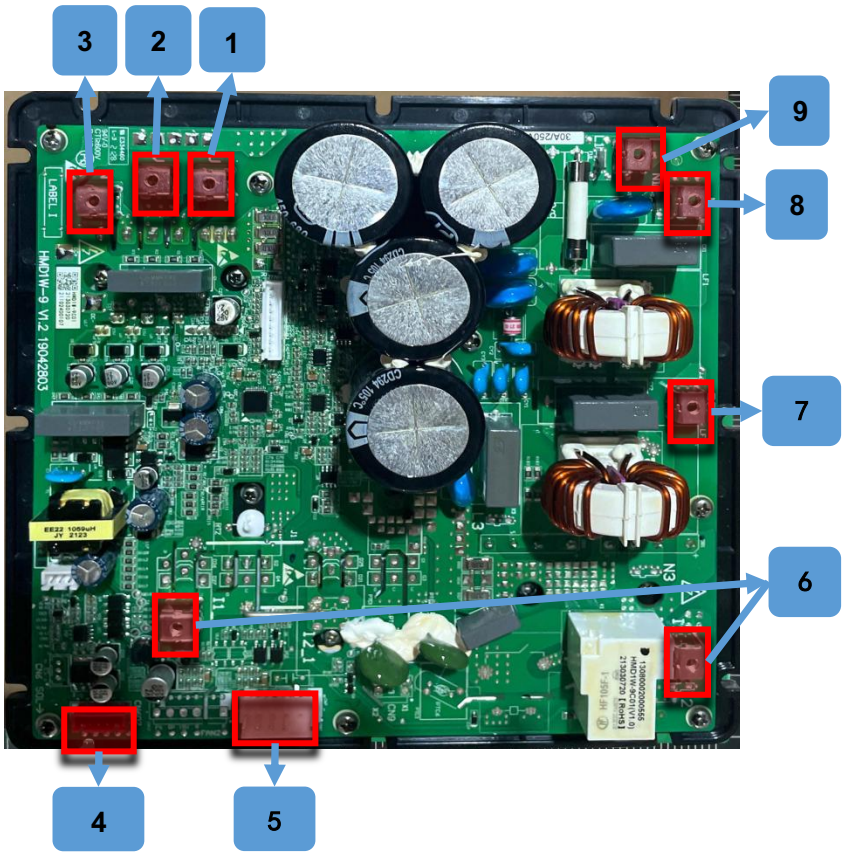


Port	Description	Port	Description
OUT1	Bulit-in Water Pump	DI5	Reserve
OUT2	P_b# Heating/Cooling Water Pump	DI4	Forced Cooling Switch
OUT3	SV2# 3-Way Valve (to Heating)	DI3	Linkage Switch (External Water Pump)
OUT4	SV2# 3-Way Valve (to Cooling)	DI2	Forced Heating Switch
OUT5	SV1# 3-Way Valve (DHW)	DI1	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

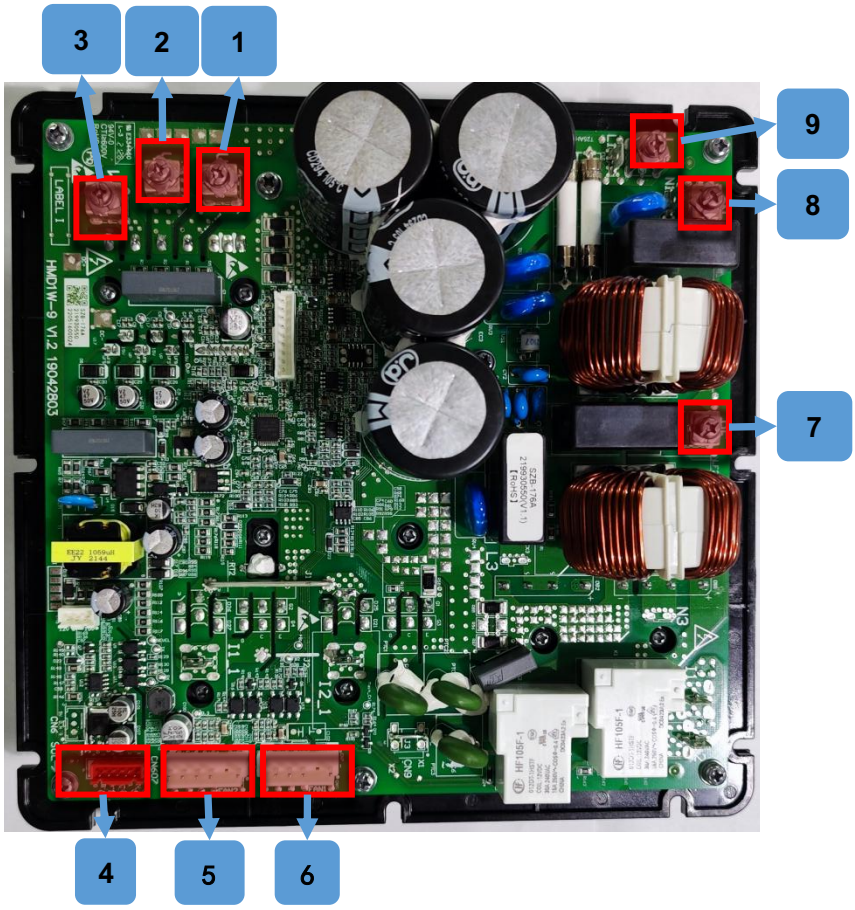
1.3.3.3 AP4- Power Supply Board

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

1.3.3.4 AP2- Compressor Drive Board

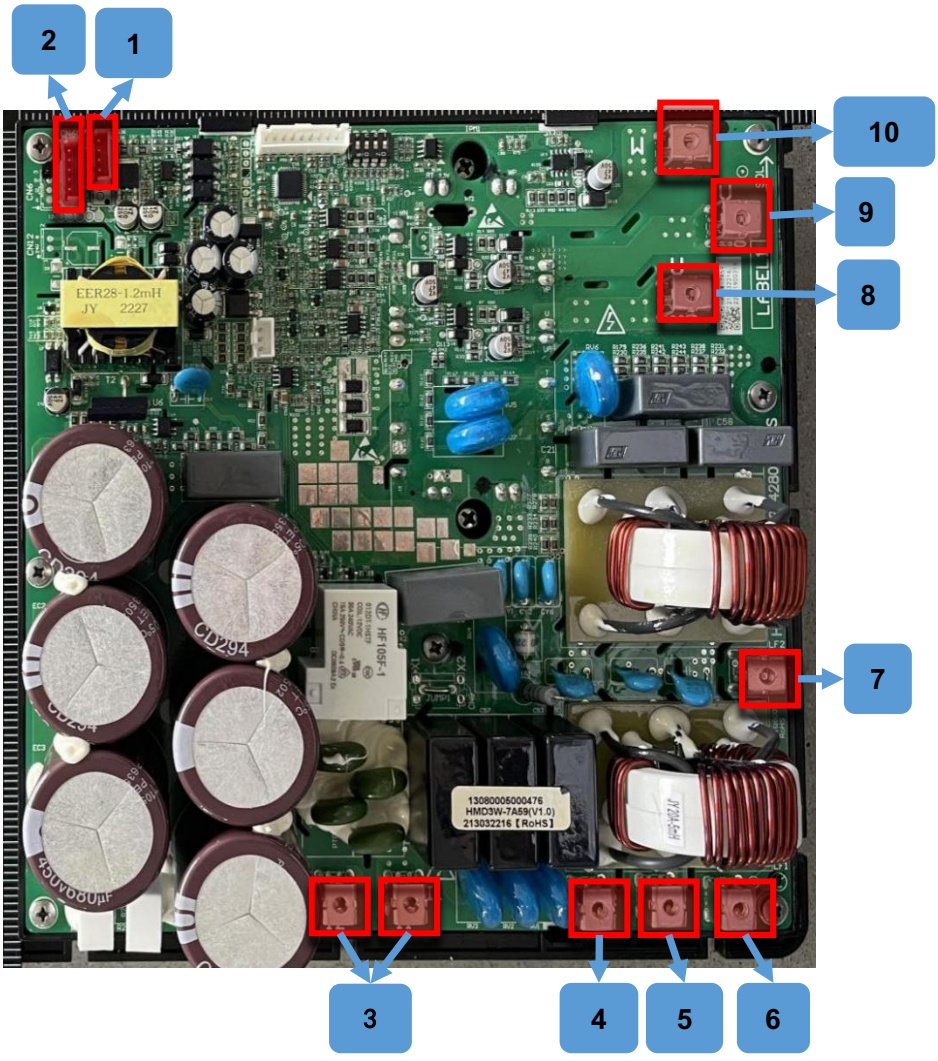


Model	No.	Description
HH-C1-6	1	Compressor Output U
	2	Compressor Output V
	3	Compressor Output W
	4	RS485(to AP1)
	5	Fan
	6	Reactors
	7	PE
	8	Power Supply N (VAC230)
	9	Power Supply L (VAC230)



Model	No.	Description
HH-C1-12 HH-C1-18	1	Compressor Output U
	2	Compressor Output V
	3	Compressor Output W
	4	RS485(to AP1)

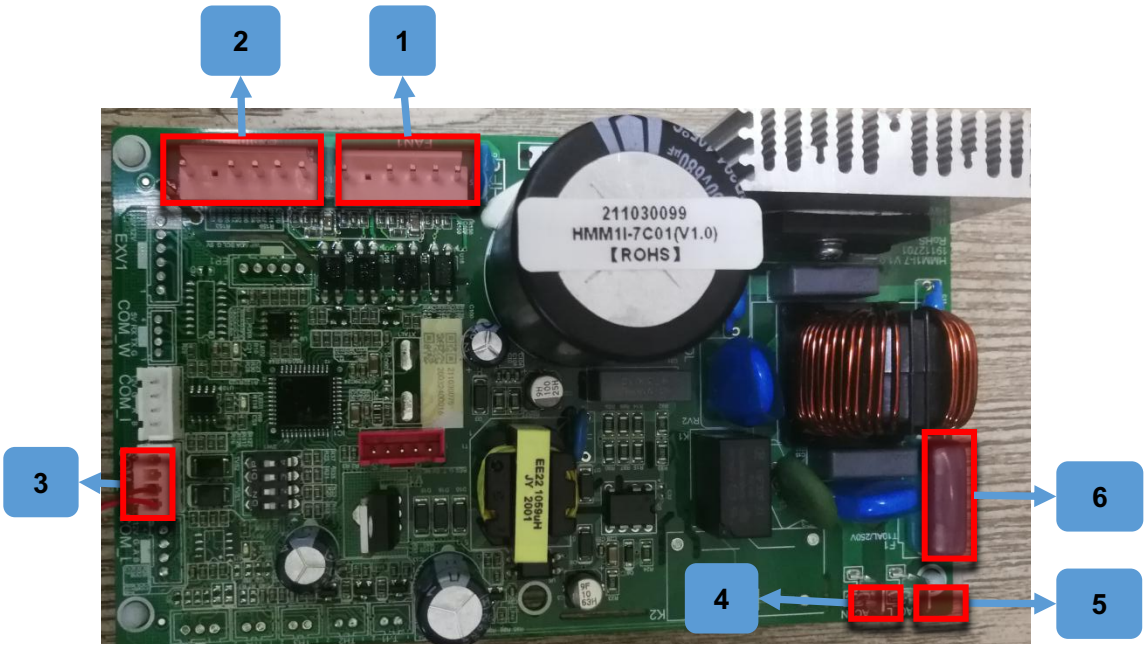
Model	No.	Description
	5	2#Fan
	6	1#Fan
	7	PE
	8	Power Supply N (VAC230)
	9	Power Supply L (VAC230)



Model	No.	Description
HH-C3-8 HH-C3-12 HH-C3-18	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)

Model	No.	Description
	7	PE
	8	Compressor Output U
	9	Compressor Output V
	10	Compressor Output W

1.3.3.5 AP5- Fan Driver Board



No.	Description
1	1# Fan Output
2	2# Fan Output
3	RS485(to AP1)
4	Power Supply N (VAC230)
5	Power Supply L (VAC230)
6	Fuse

1.3.4 Built-in Temperature Sensors

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

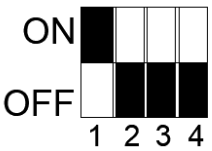
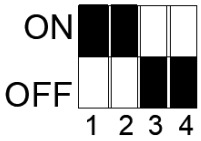
No.	Sensor Type	Color/Spec.	Enable by	Refer to	Note
T9	Total Water Outlet Temp.	Black/5K	DIP Switch	1.3.5.2	Disable (Default)
T10	Buffer Tank Temp.	Green/5K	DIP Switch	1.3.5.2	Disable (Default)
T11	Zone 2 Temp.	Yellow/5K	P257	2.7.5	Disable (Default)
T12	Solar Water Heater Temp.	Orange/5K	P151/P152	2.7.3.5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

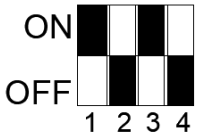
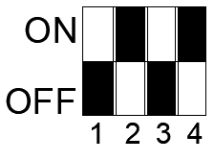
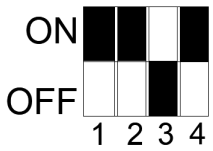
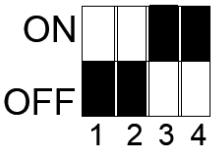
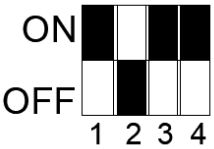
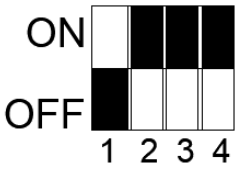
1.3.5 DIP Switch Definitions

DIP Switch Type	Functions	Status
1/2/3/4	Setting the Master and Slave Addresses	
5/6/7/8	Setting Unit Functions	
**The black square represents the position of the switch*		

1.3.5.1 DIP Switch Type 1/2/3/4

Address setting combinations for master and slave:

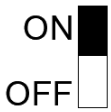
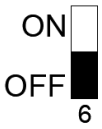
No.	SE1	SE2	SE3	SE4	Status
Master	OFF	OFF	OFF	OFF	
Slave1	ON	OFF	OFF	OFF	
Slave2	OFF	ON	OFF	OFF	
Slave3	ON	ON	OFF	OFF	

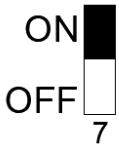
No.	SE1	SE2	SE3	SE4	Status
Slave4	OFF	OFF	ON	OFF	
Slave5	ON	OFF	ON	OFF	
Slave6	OFF	ON	ON	OFF	
Slave7	ON	ON	ON	OFF	
Slave8	OFF	OFF	OFF	ON	
Slave9	ON	OFF	OFF	ON	
Slave10	OFF	ON	OFF	ON	
Slave11	ON	ON	OFF	ON	
Slave12	OFF	OFF	ON	ON	
Slave13	ON	OFF	ON	ON	
Slave14	OFF	ON	ON	ON	

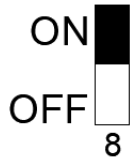
No.	SE1	SE2	SE3	SE4	Status
Slave15	ON	ON	ON	ON	
*The black square represents the position of the switch					

1.3.5.2 DIP Switch Type 5/6/7/8

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

Function	SE6	Status
Enable Buffer Tank Temp. Sensor	ON	
Disable Buffer Tank Temp. Sensor	OFF (default)	
*The black square represents the position of the switch		

Function	SE7	Status
Enable Total Water Outlet Temp. Sensor	ON	
Disable Total Water Outlet Temp. Sensor	OFF (default)	
*The black square represents the position of the switch		

Function	SE8	Status
Three-phase models	ON	
Single-phase models	OFF	
*The black square represents the position of the switch		

2 Installation

2.1Precautions Before Installation

1. The heat pump cooling and heating water system should be a closed system, if using antifreeze or another 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℃, 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.

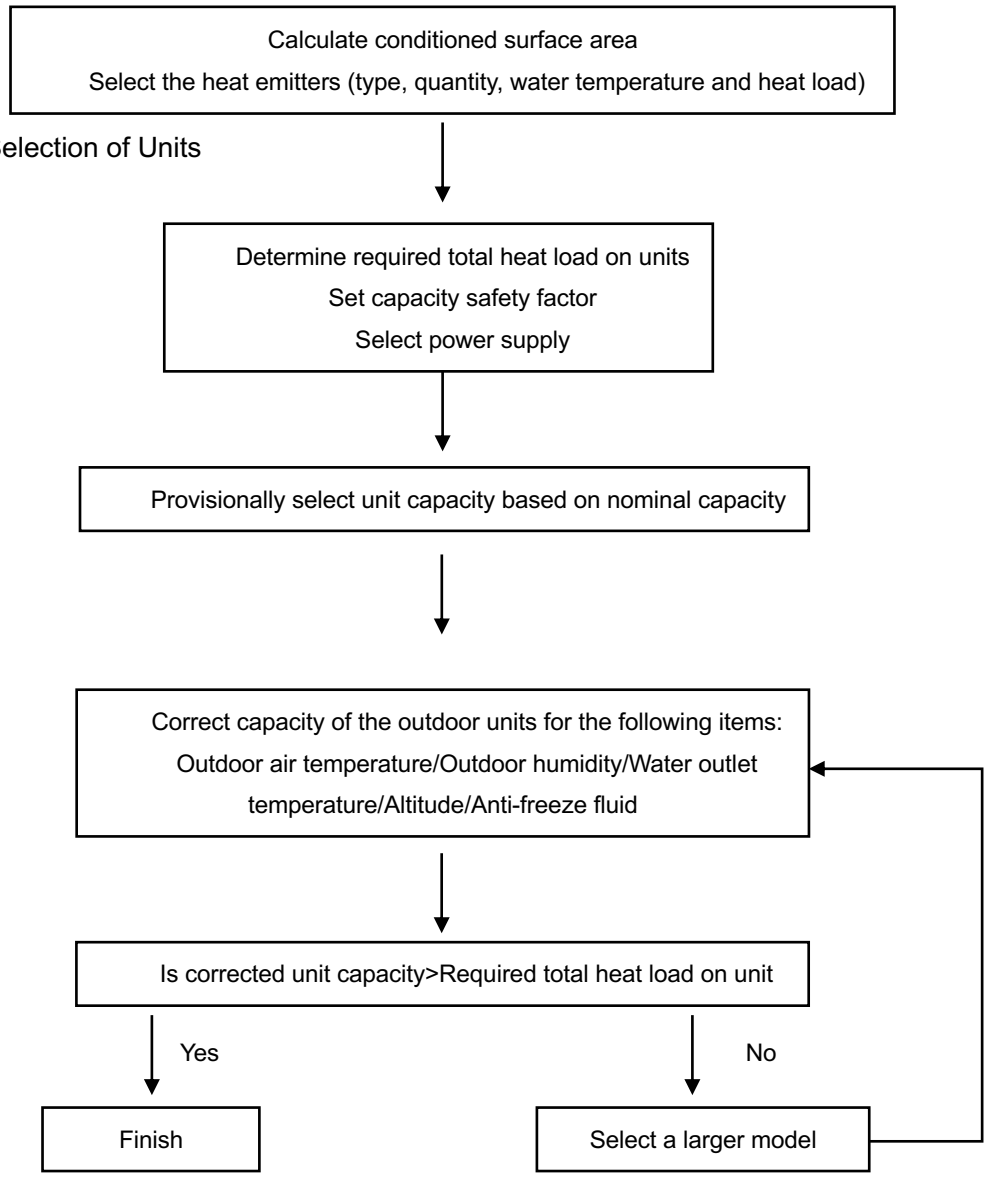
contact with the manufacturer's after-sales service department. If it continues to operate abnormally, it may cause electric shock or fire.

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.

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



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.

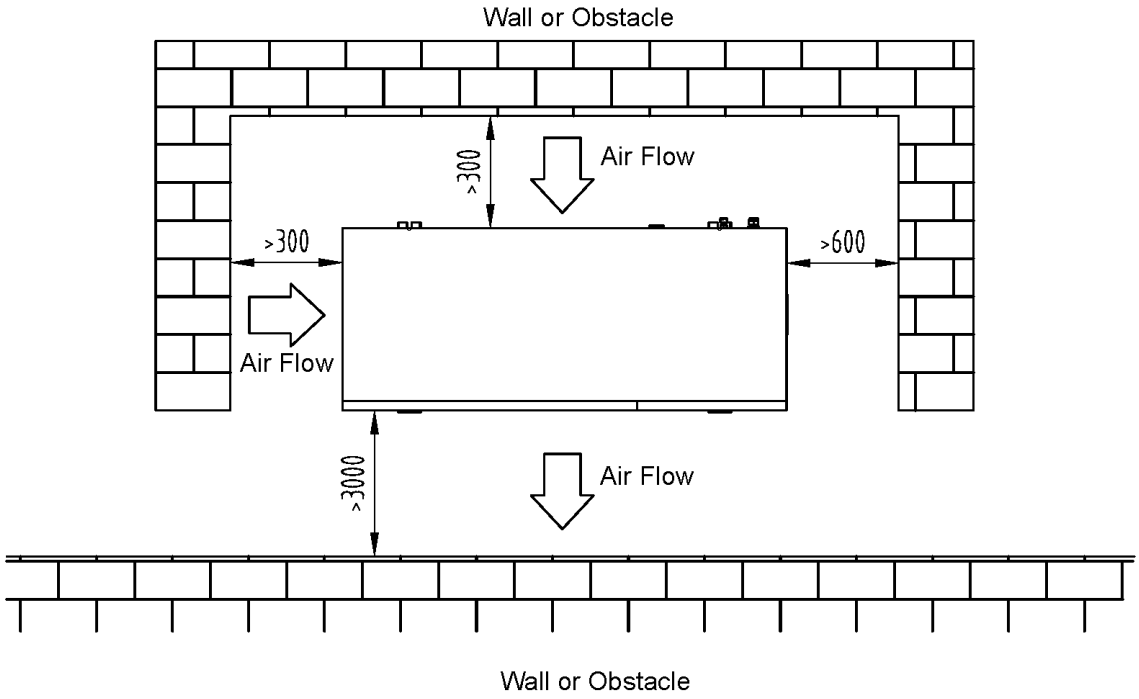
8.To avoid causing a nuisance to neighbors, make sure the unit is installed so that it is positioned towards the area that is least sensitive to noise.

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

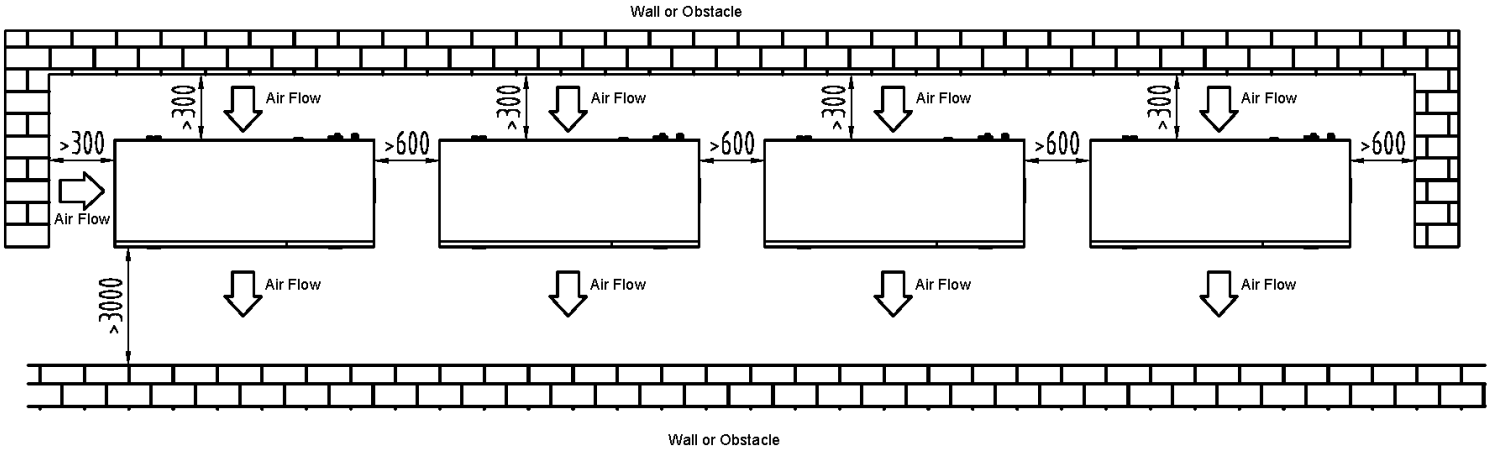


2.3.1.2 Cascade Installation Requirements

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:

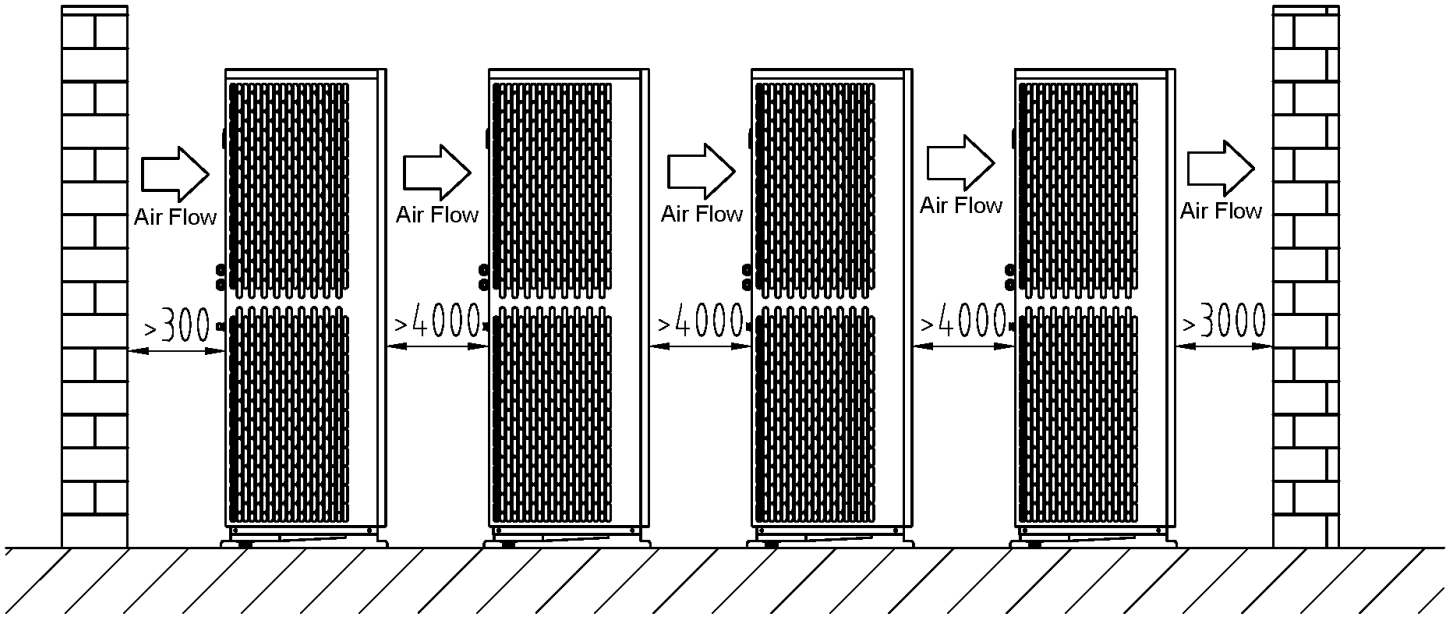
Installation Type 1: the distance between the air inlet surface and the wall is more than 300 mm, the distance between every 2 units is more than 600 mm, as shown in the figure:

Unit:mm



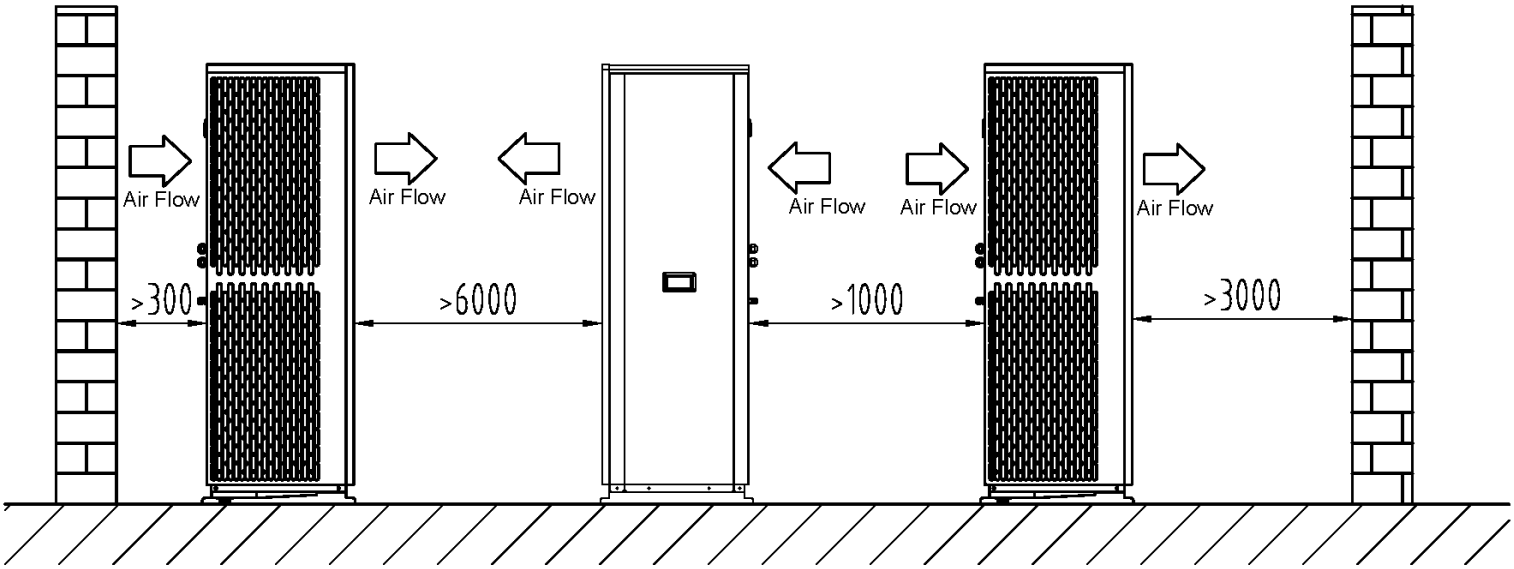
Installation Type 2: the distance between the air inlet surface and the wall is more than 4000 mm, the distance between every 2 units is more than 4000 mm, as shown in the figure:

Unit:mm



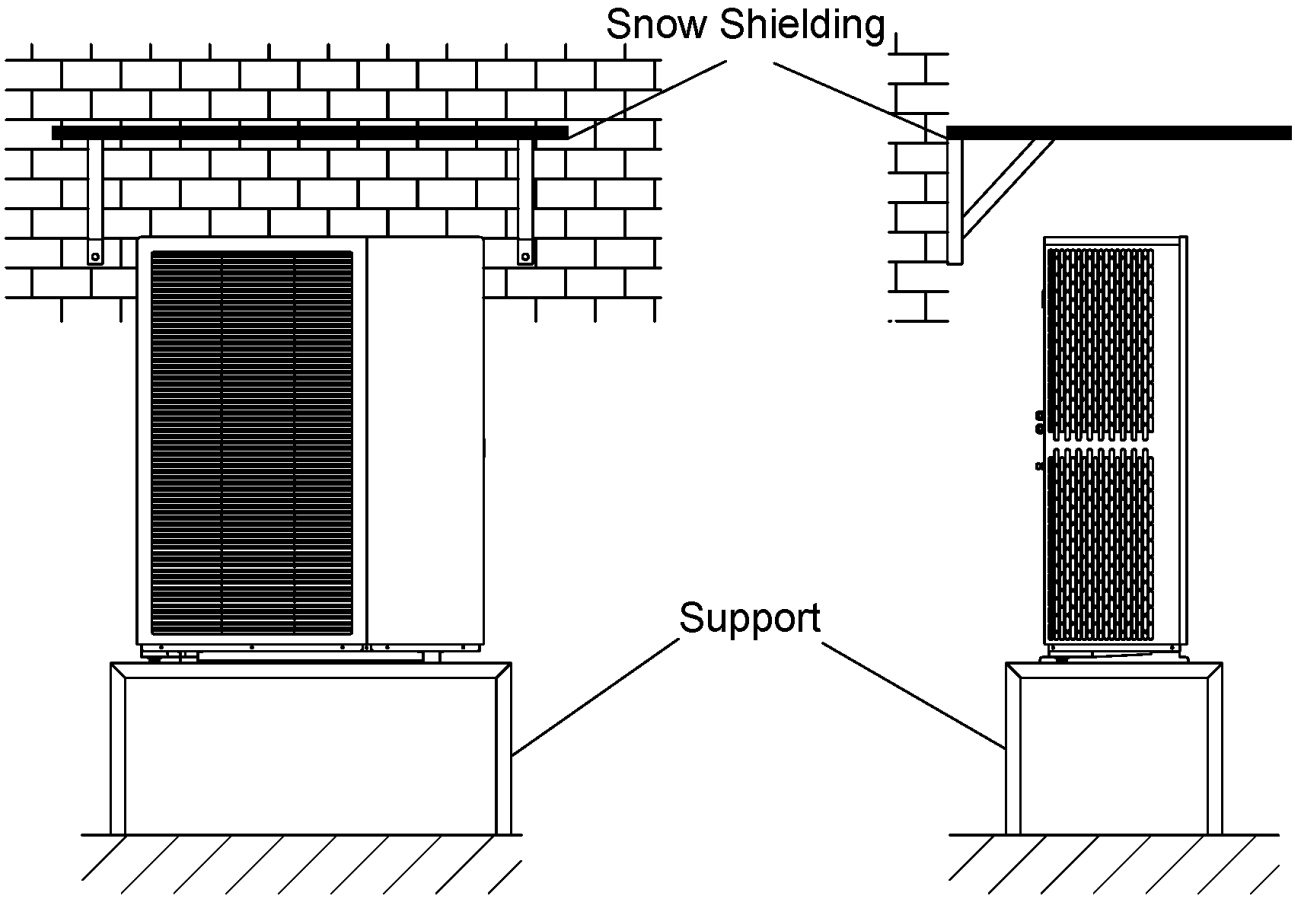
Installation Type 3: the distance between the air inlet surface and the air inlet surface is more than 300 mm, the distance between every 2 units is more than 4000 mm, as shown in the figure:

Unit:mm



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.



2.3.1.4 Hot Climate Installation

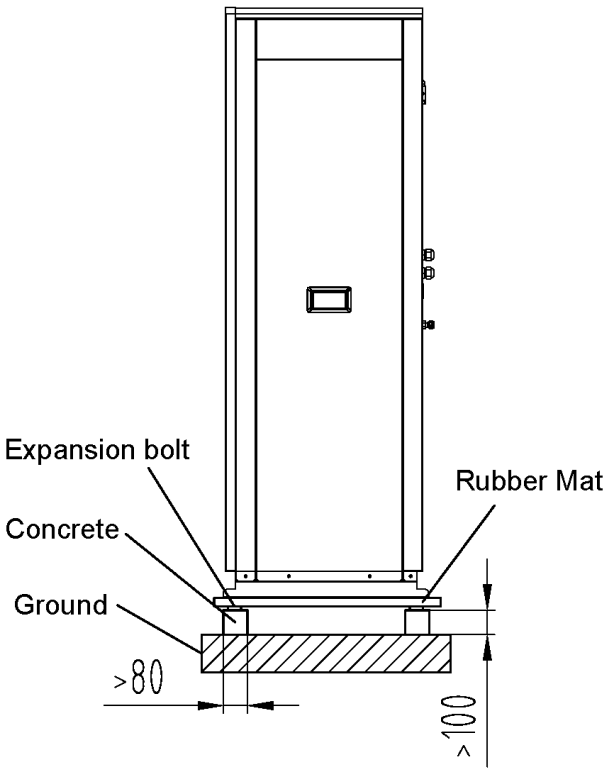
As the outdoor temperature is measured via the outdoor ambient temperature sensor, make sure to install the unit in the shape, or a canopy should be constructed to avoid direct sunlight. So that it is not influenced by the sun's heat, otherwise system protection may occur.

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.
- Based 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 Φ10 expansion bolt. It is best to screw in the foundation bolts until their length is 20mm from the foundation surface.

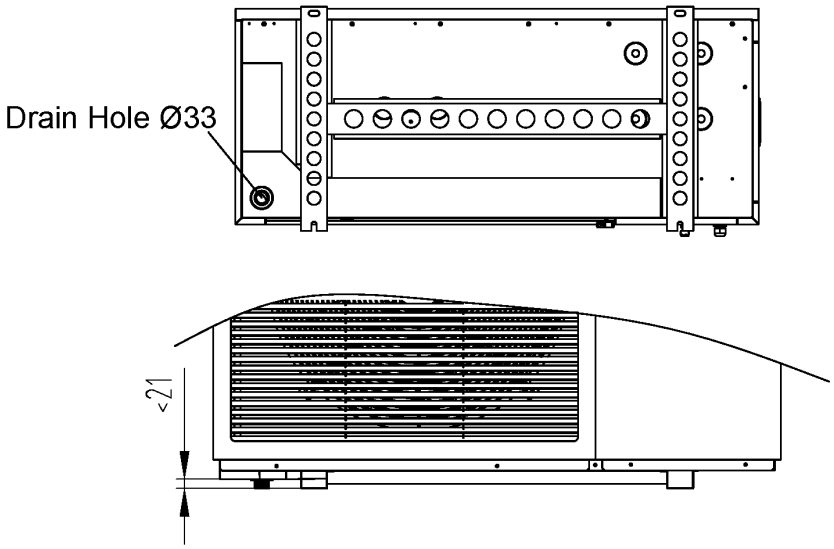
Unit:mm



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

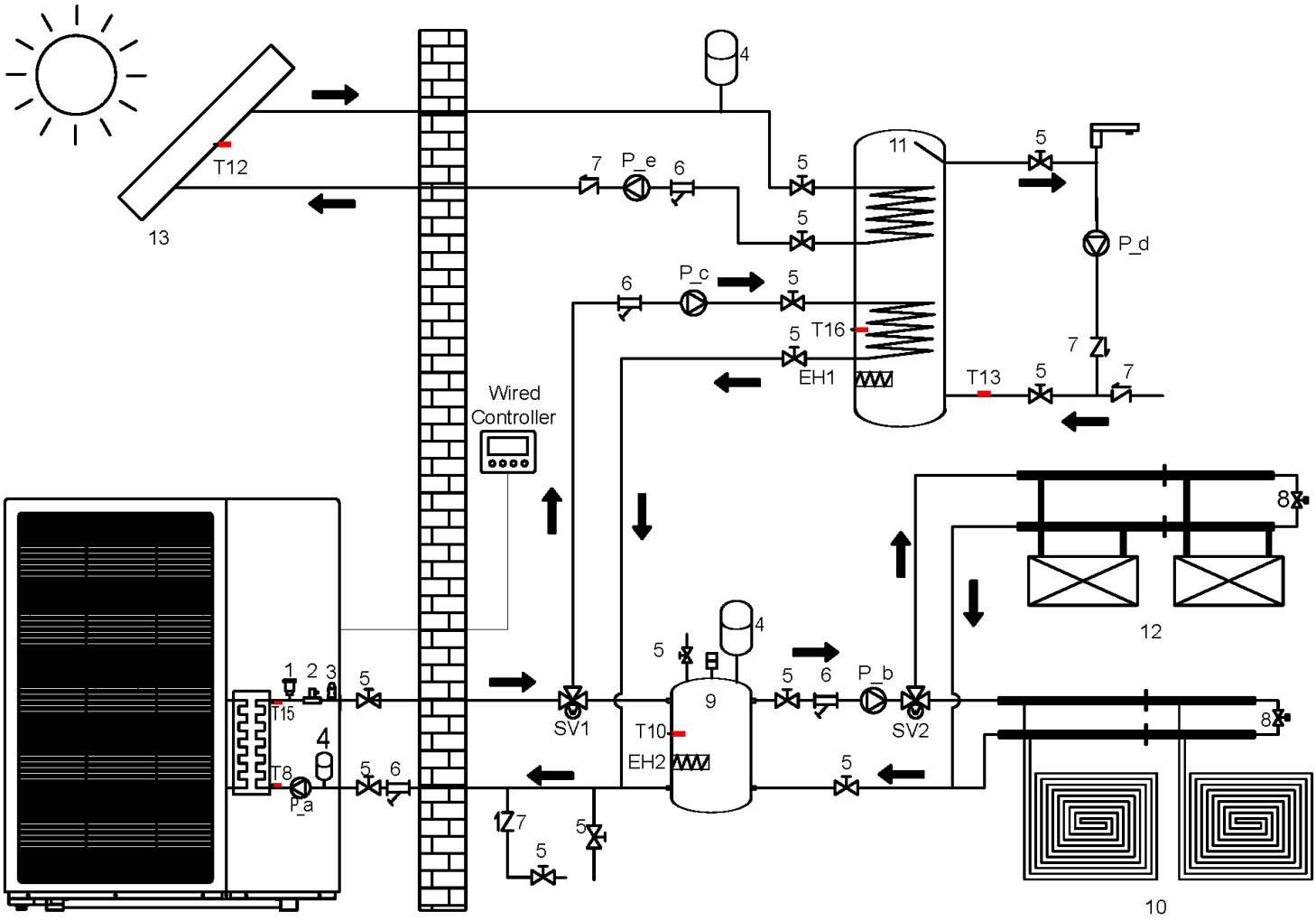


When installing the drain spout, pay attention to the distance of the chassis from the footing

2.4 Water System Installation

2.4.1 Precaution

2.4.1.1 Installation Diagram



NOTE:

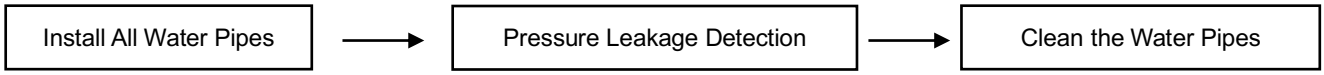
- The layout of the same program water pipe is conducive to the uniform distribution of water flow.
- The system shall be installed with automatic water refill valve, and the highest point shall be installed with automatic exhaust valve.
- The drain valve is installed at the bottom of the pipeline, which 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 ℃.

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 ⩾ 7bar, 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

ΔT -- Difference in water temperature(take 3°C), unit: ℃

t -- Unit defrost time (take 240s)

C -- Specific heat capacity of water (take 4. 2 (kJ / (kg·℃)))

Total water volume of heating system $V2$:

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

Formula in:

π -- 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	HH-C1-6	HH-C1-8 HH-C3-8	HH-C1-12 HH-C3-12	HH-C1-18 HH-C3-18
Recommend Volume (L)	50-70	60-80	80-100	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	32	22	28	32
	Corrugated Pipe	22	28	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^2

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

q -- Heat exchange per unit area, unit: kW/m^2

Coil length calculation L:

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

Formula in

S -- Outer surface area of internal coil, unit: m^2

π -- 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

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

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_2O) 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
Preset Pressure (bar)	1.5~3							
Maximum Pressure (bar)	10							
Connection Diameter (inch)	G3/4"							
Maximum working temperature (℃)	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

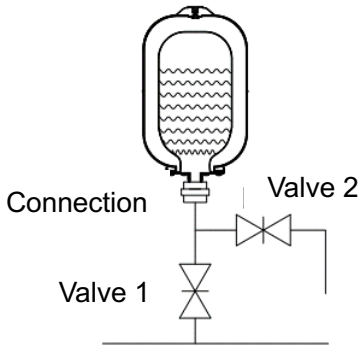
The coefficient of thermal expansion of water			
Temperature (℃)	Expansion Coefficient	Temperature (℃)	Expansion Coefficient
0	0.00013	55	0.01447
10	0.00025	60	0.01704
15	0.00085	65	0.01979
20	0.00180	70	0.02269
25	0.00289	75	0.02575

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

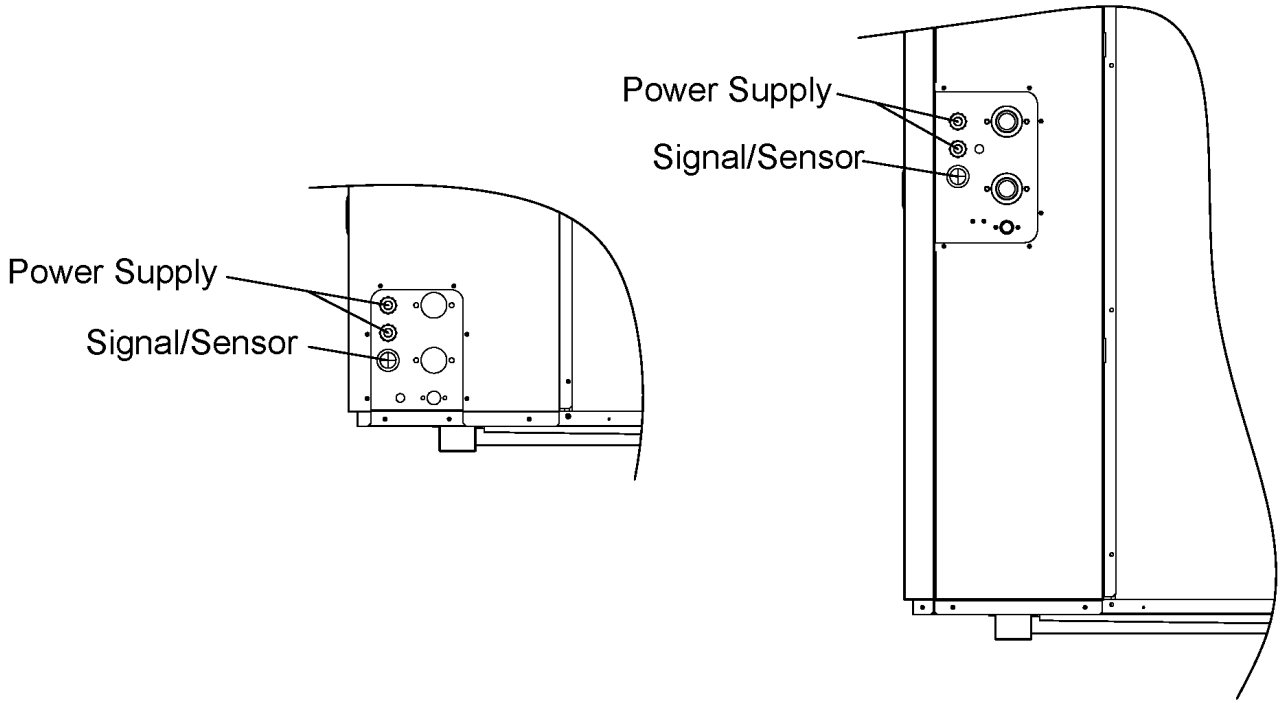
To function safely and maintain the integrity of your electrical system, the unit must be connected to a general electricity supply under the following regulations:

- 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
HH-C1-6	220-240V~/ 50Hz	3G 2.5mm²	AWG 14
HH-C1-8		3G 4mm²	AWG 12
HH-C1-12		3G 4mm²	AWG 12
HH-C1-18		3G 6mm²	AWG 10
HH-C3-8	380V-415V/3N ~/ 50Hz	5G 4mm²	AWG 12
HH-C3-12		5G 4mm²	AWG 12
HH-C3-18		5G 6mm²	AWG 10

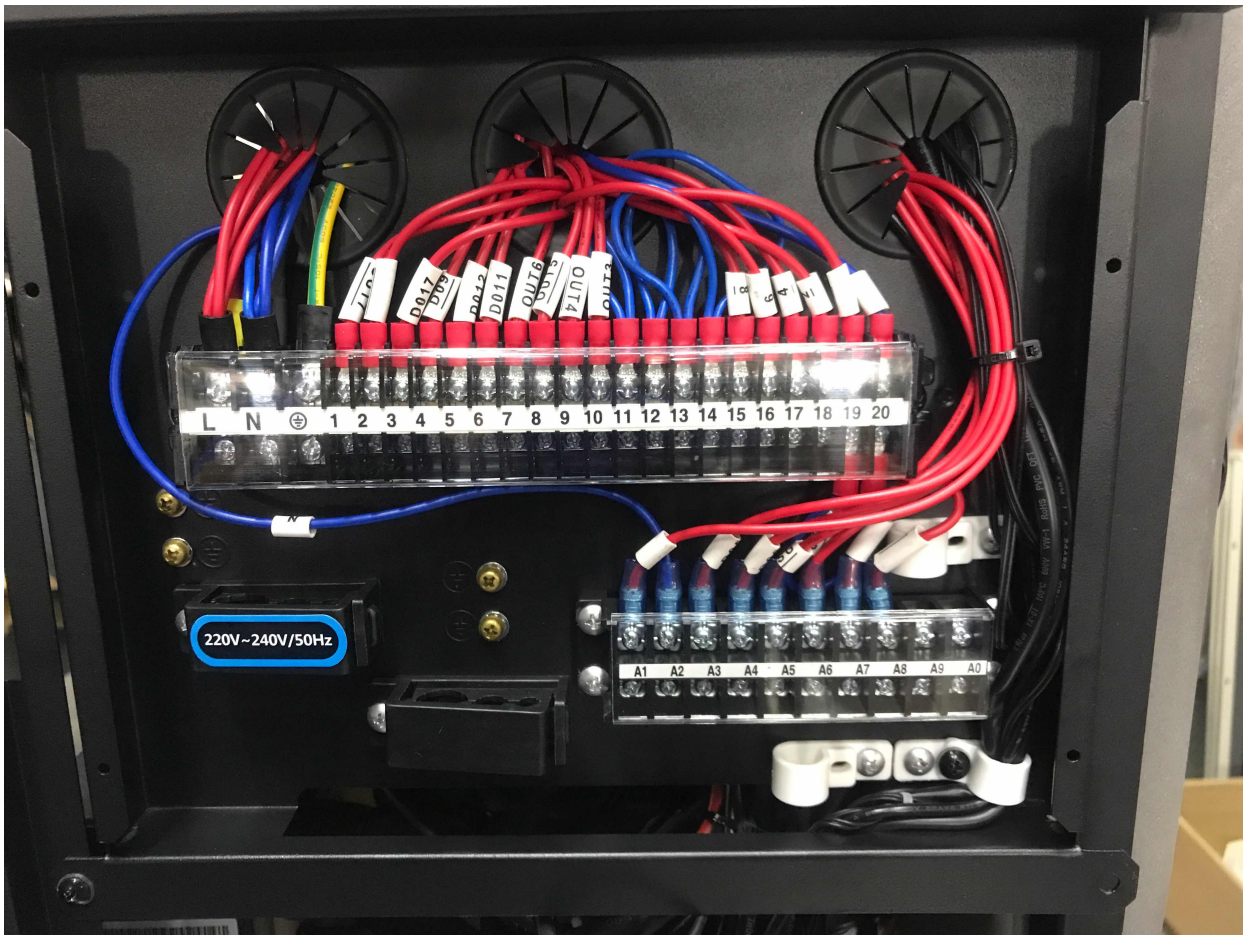
2.5.3 Power Cord Outlet Guidelines

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



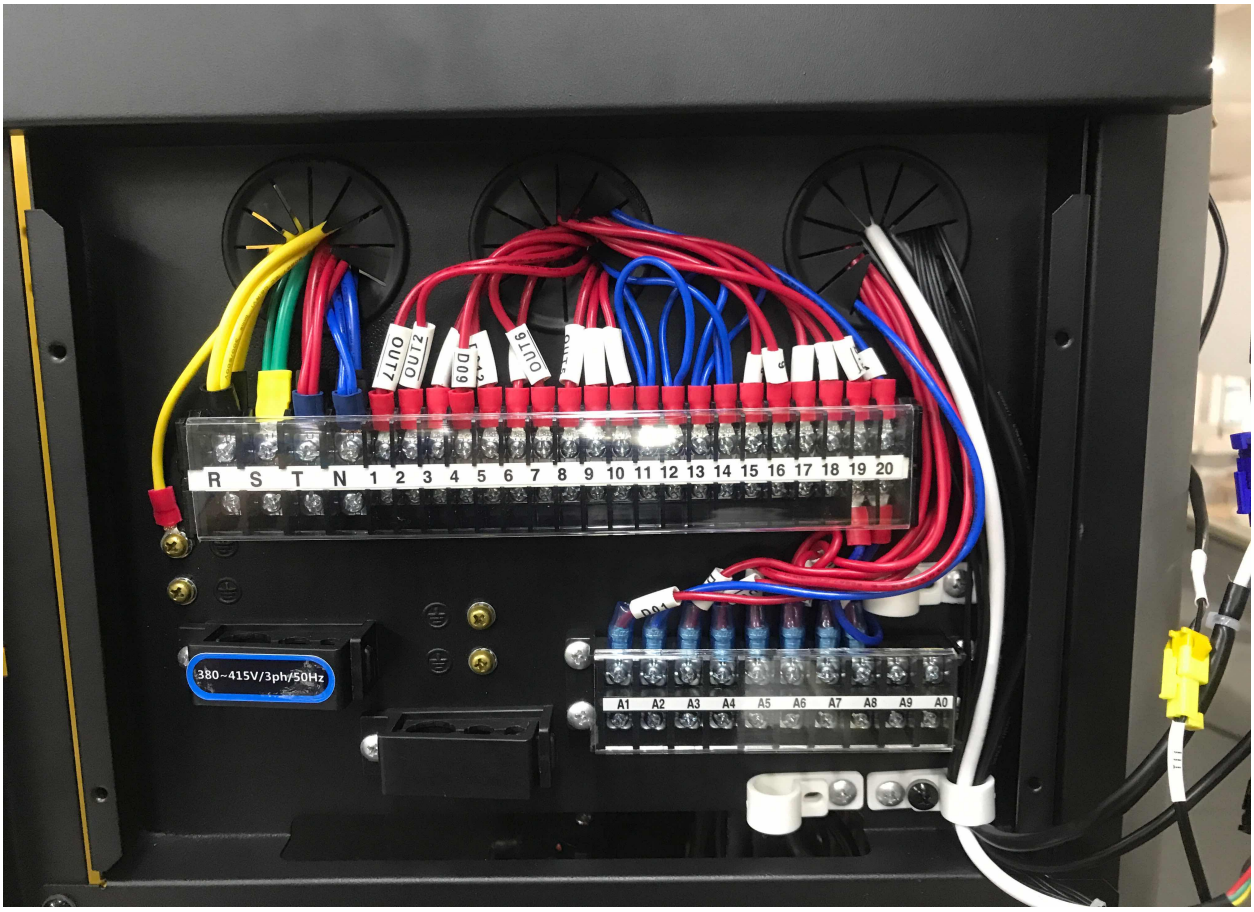
2.5.4 Terminal Block Port Introduction

2.5.4.1 HH-C1-6/ HH-C1-8/ HH-C1-12/ HH-C1-18



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		

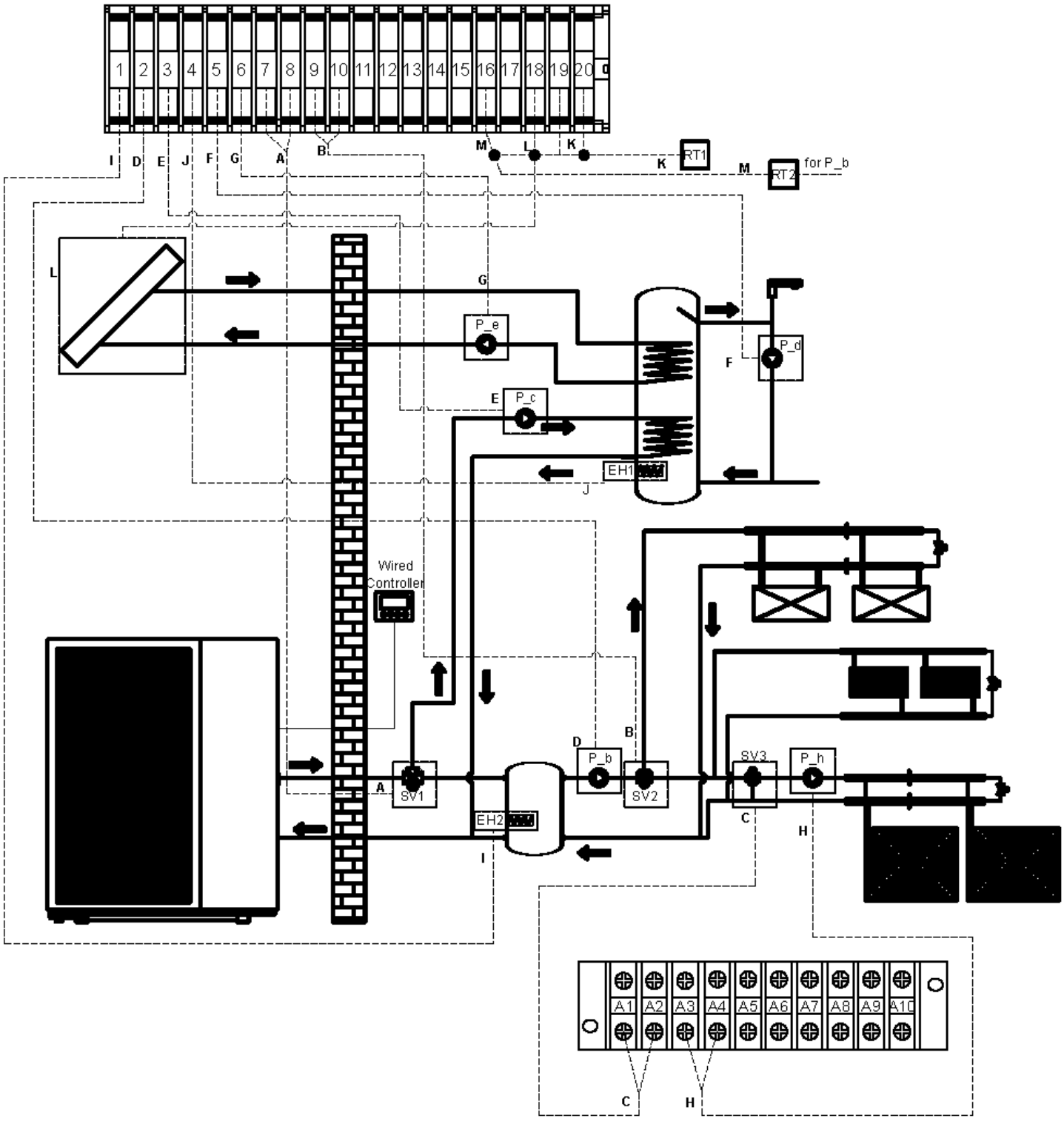
2. 5. 4. 2 HH-C3-8/ HH-C3-12/ HH-C3-18



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.

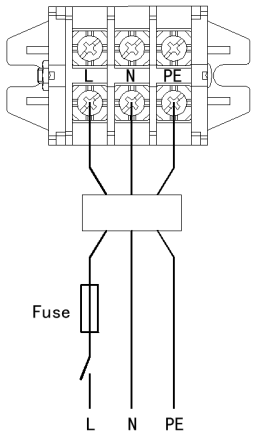
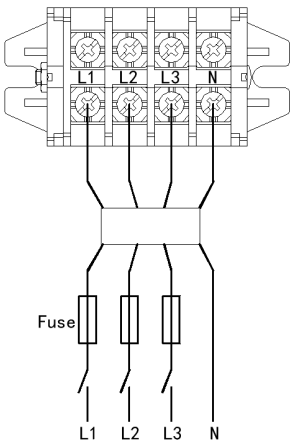


No.	Description	No.	Description
A	SV1# 3-Way Valve	H	P_h# Mixing Water Pump
B	SV2# 3-Way Valve	I	EH2# Electric Heater (Buffer Tank)
C	SV3# Mixing Valve	J	EH1# Electric Heater (DHW)
D	P_b# Heating/Cooling Water Pump	K	Room Thermostat (for Heat Pump)
E	P_c# Auxiliary Water Pump	L	Solar Water Heater
F	P_d# DHW Return Water Pump	M	Room Thermostat (For P_b)
G	P_e# AHS Water Pump		
**Relays need to be added between the unit and control components.*			

The unit voltage can be output in two ways.

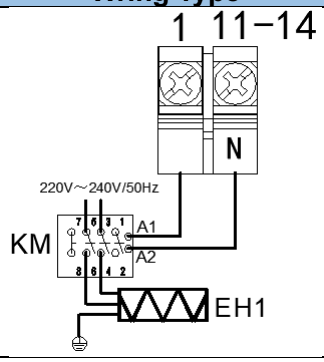
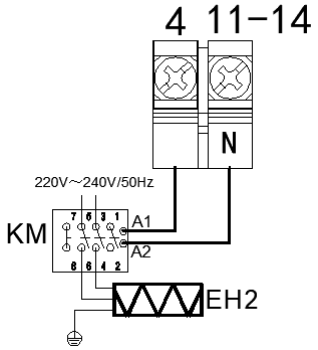
Type	Output
1	AC220V-240V~/50Hz
2	Passive

2.5.5.1 Power Supply

Type	Wring Type	Type	Wring Type
Single Phase		Three Phase	

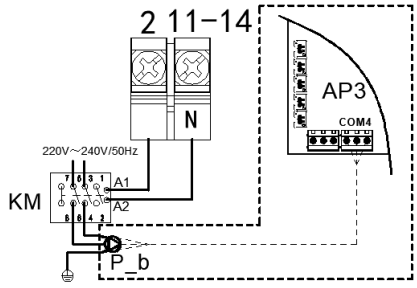
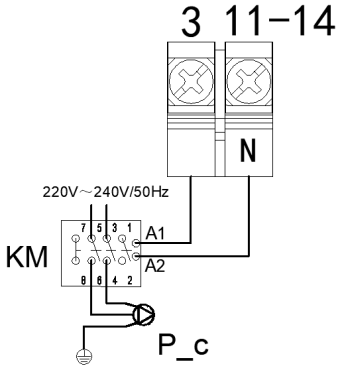
2.5.5.2 Electric Heater/AHS

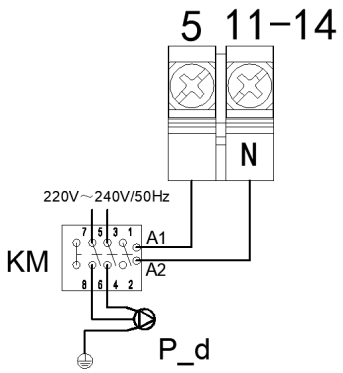
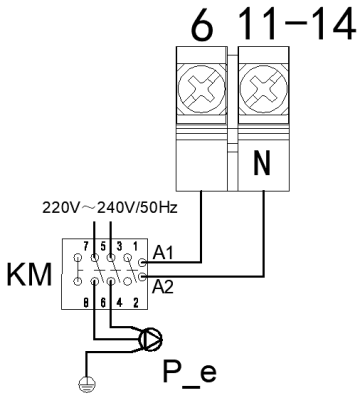
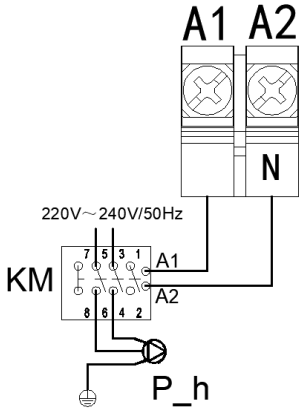
Electric heater requires additional relays, please refer to wiring diagram:

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

2.5.5.3 Water Pump

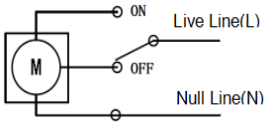
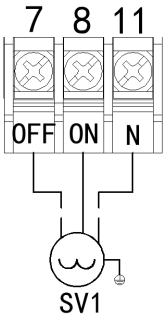
Water pump requires additional relays, please refer to wiring diagram:

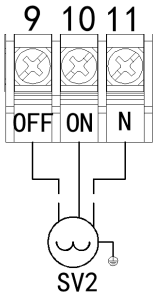
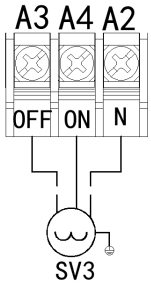
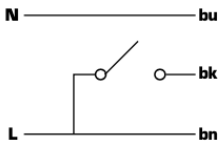
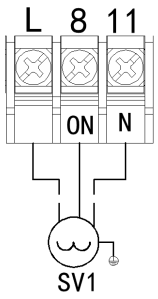
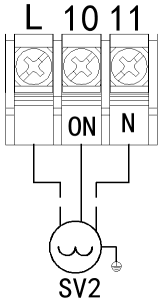
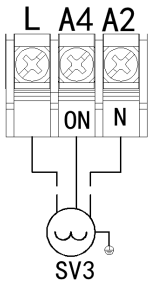
No.	Wring Type	Output Type
P_b[1] Heating/Cooling Water Pump		Type 1
P_c Auxiliary Water Pump		

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

2.5.5.4 Three-Way Valve

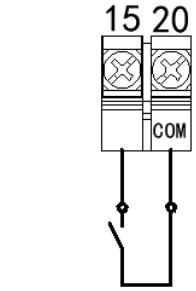
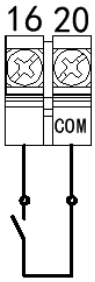
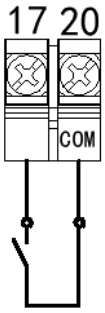
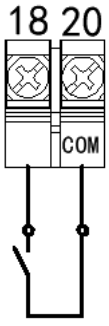
There are two wiring types for 3-way valves, please refer to the wiring diagram：

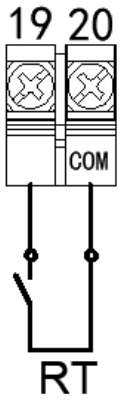
Control Type	No.	Wring Type	Description	Output Type
Type 1 （Recommend） 	SV1 3-Way Valve		When the unit is running in heating mode, terminal 7# outputs voltage and terminal 8# no output. When the unit is running in hot water mode, terminal 7# no output and terminal 8# outputs voltage.	Type 1

	SV2 3-Way Valve		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.	
	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.	
Type 2 	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 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.	
	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	
**Only for underfloor heating mode and cooling mode switching, if you use the heater to heat and the air panel to cool, then please select the underfloor heating mode and cooling mode combination*				

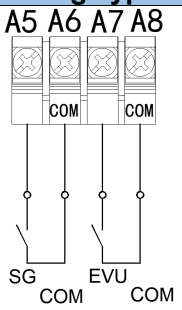
2.5.5.5 Linkage Switch

Refer to section 2.7.5 for parameterization.

No.	Wring Type	Output Type
Forced Cooling Switch	 RT(Froce Cooling)	Type 2
Linkage Switch (External Water Pump)	 RT(External Water Pump)	
Forced Heating Switch	 RT(Froce Heating)	
Linkage Switch (Heat Source of DHW)	 Solar Water Heater	

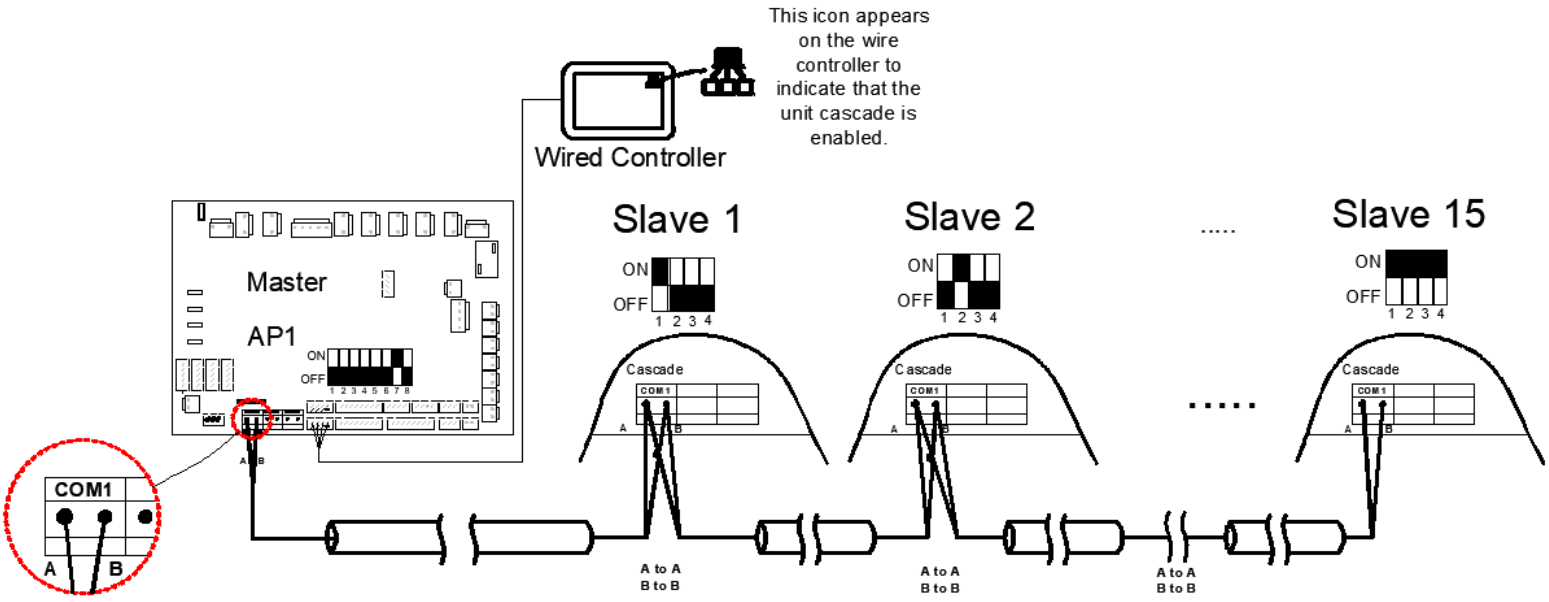
Linkage Switch (Room Thermostat)		

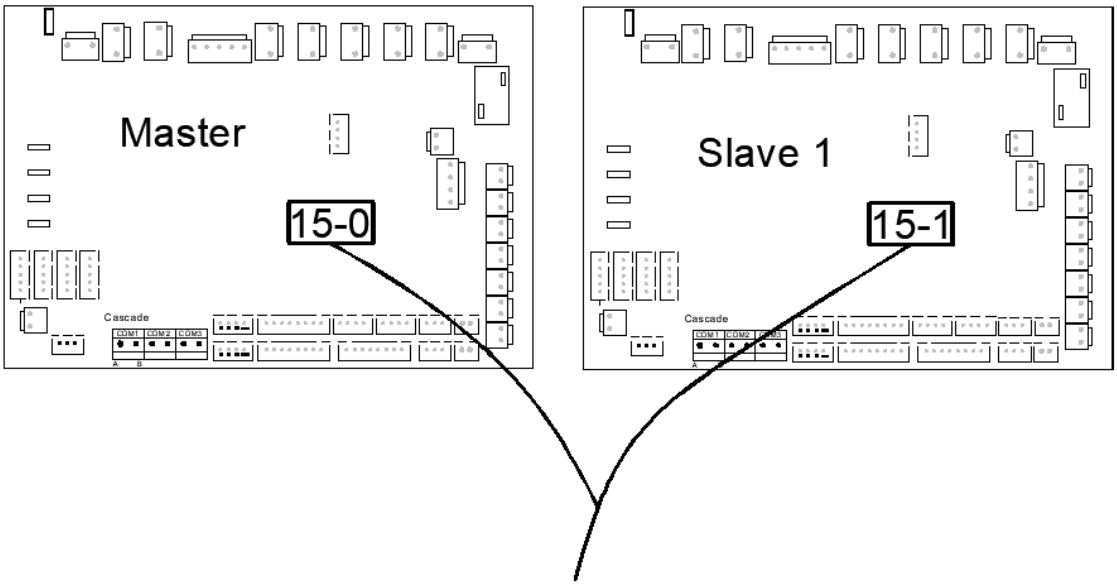
2.5.5.6 SG Ready

No.	Wring Type	Output Type
SG Ready		Type 2

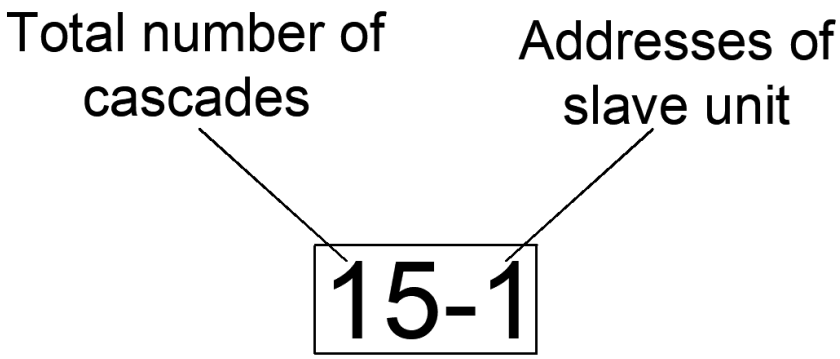
2.5.5.7 Cascade

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.
- Make sure the Communication cables be shielded and grounded.
- Make sure the cascades ports on the different units are connected correctly (A-A/B-B).
- Make sure the slave address (dip switch setting) is set correctly.
- Make sure the parameter setting is correct.

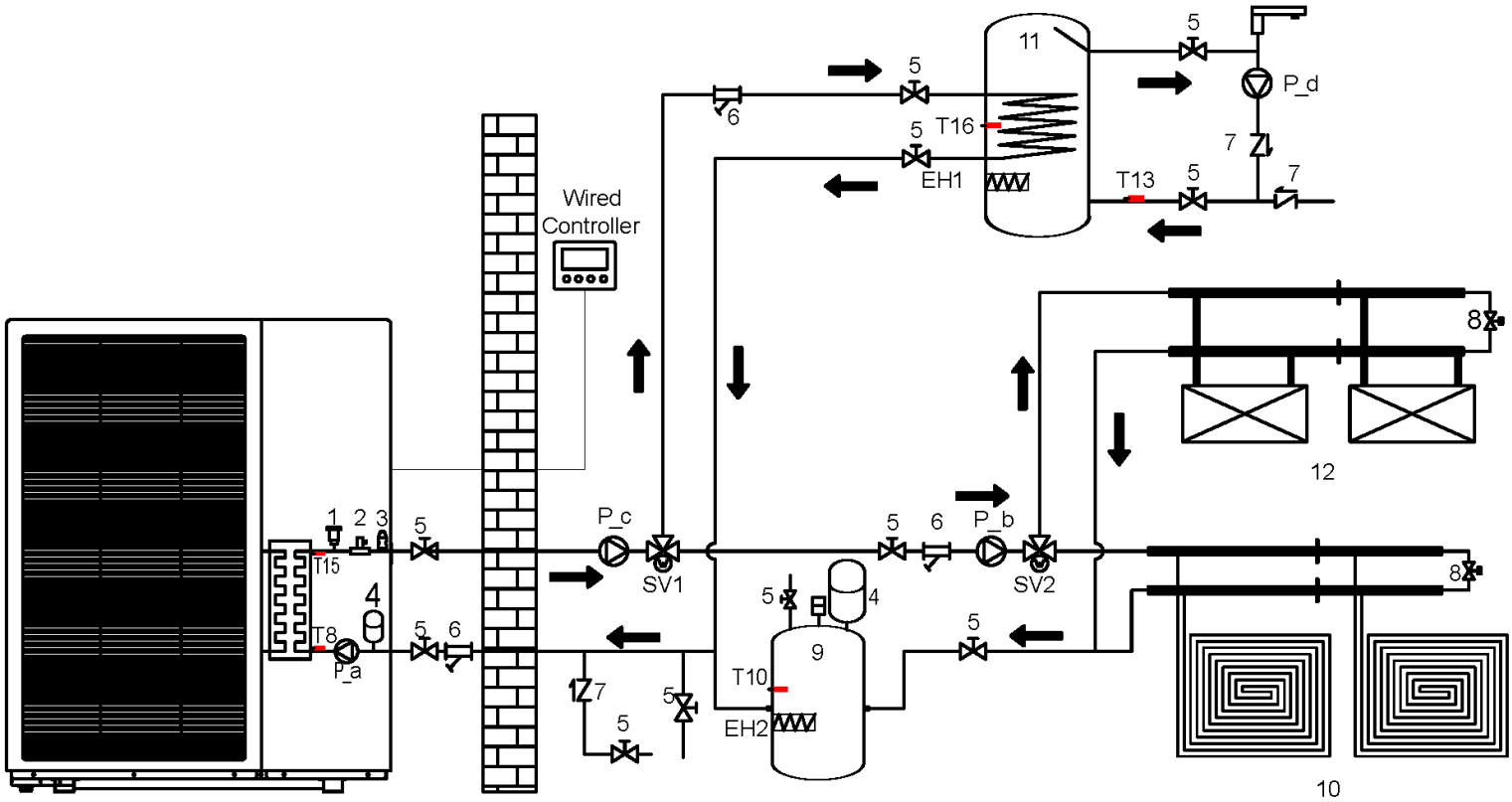
2.6 Applications and Settings

This chapter focuses on common installation applications.

2.6.1 Heat Pump System Solutions

2.6.1.1 Single Circulation System

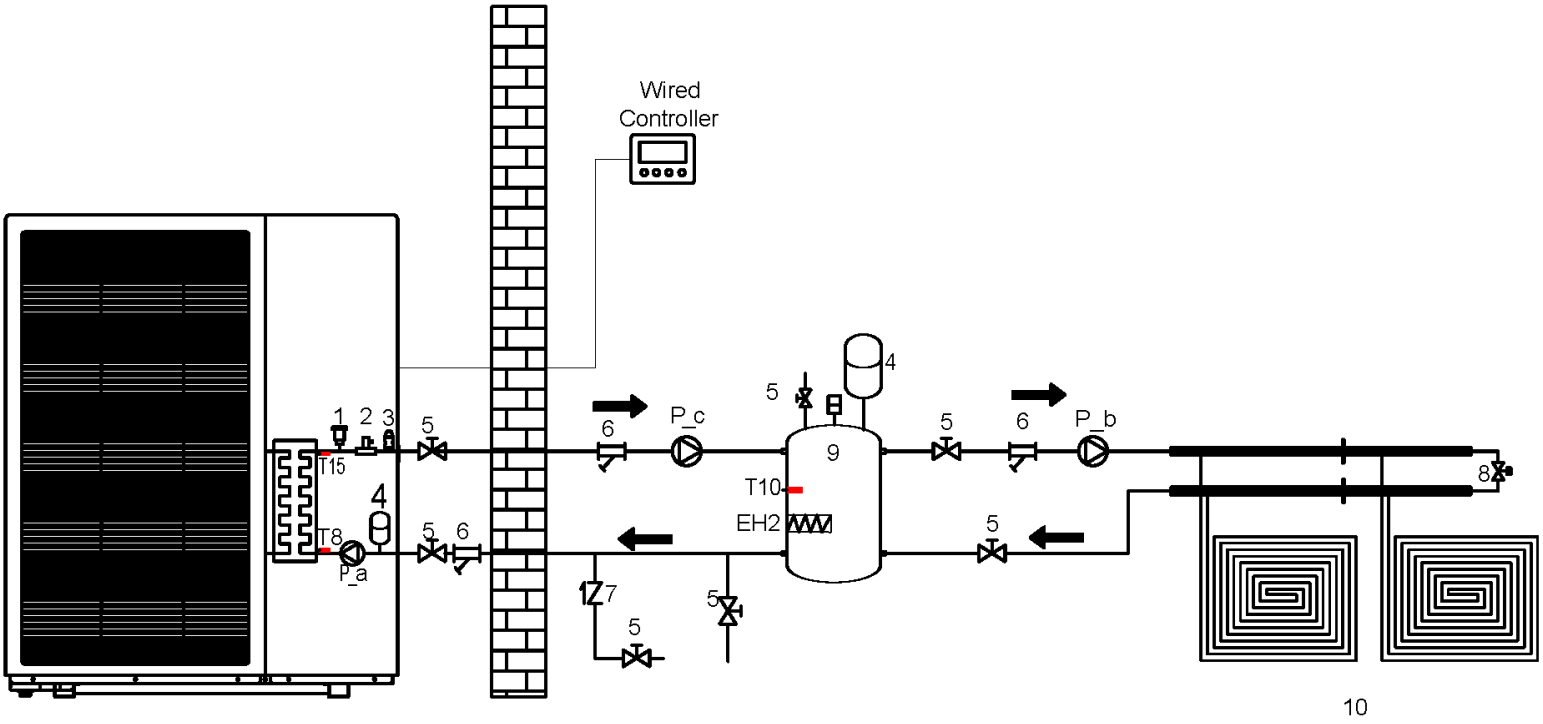
Single circulation system: there is only one circulating water circuit between the unit and the use side. Suitable for houses with relatively small areas.



Parameter Settings: P48=1 Enable DHW 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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T13[4]	DHW Return Temp. 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

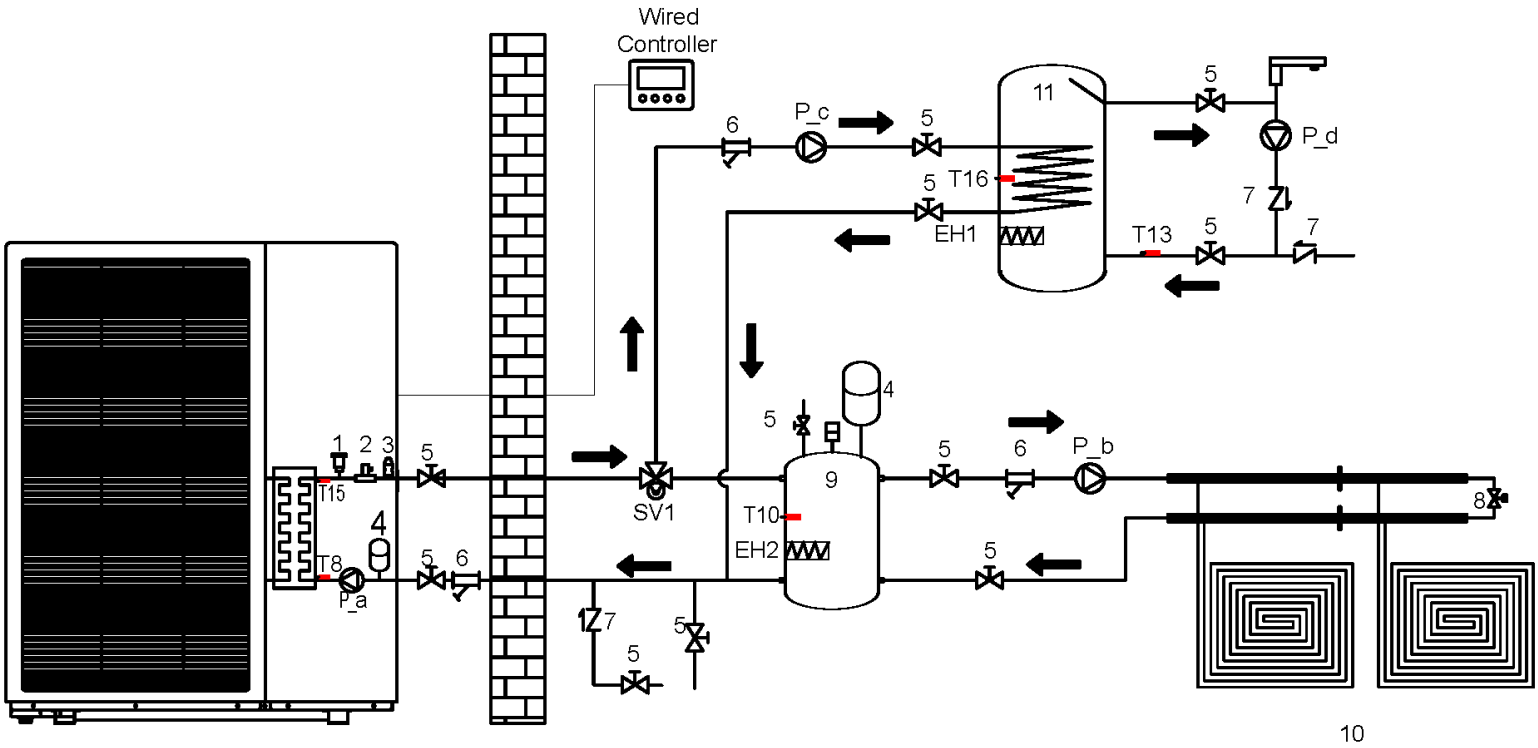


Parameter setting:
P48=0 disable DHW tank temperature sensor (default)
L12=1 disable high temperature sterilization (default)
Refer to Section 2.5 and Section 2.7 for wiring and parameter settings.

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	EH2	Electric Heater (Field Supply)
5	Ball Valves (Field Supply)	T15	Water Outlet Temp. Sensor (Built-in)
6	Filter (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T10[2]	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

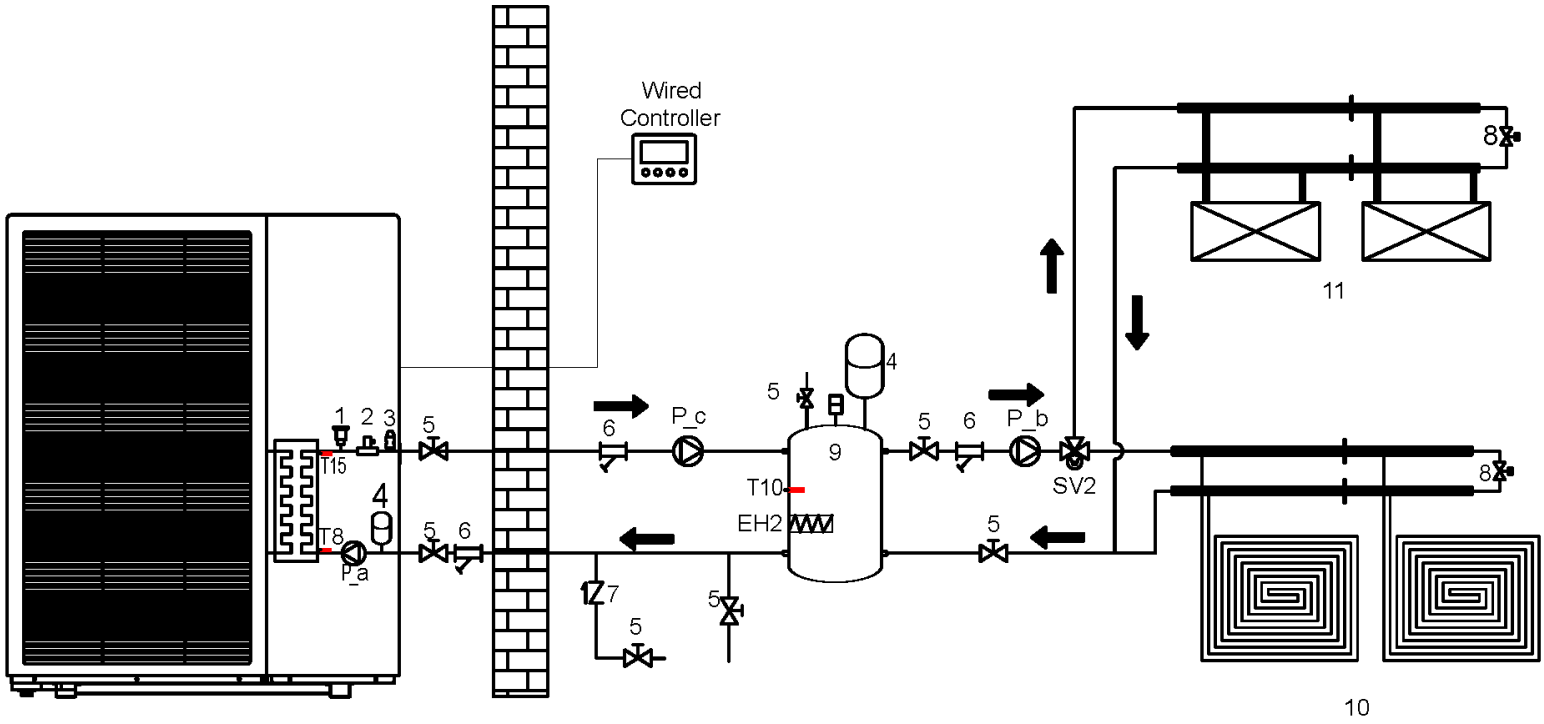


Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
Refer to section 2.5 and 2.7 for wiring and parameter setting.

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13[4]	DHW Return Tem. Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)

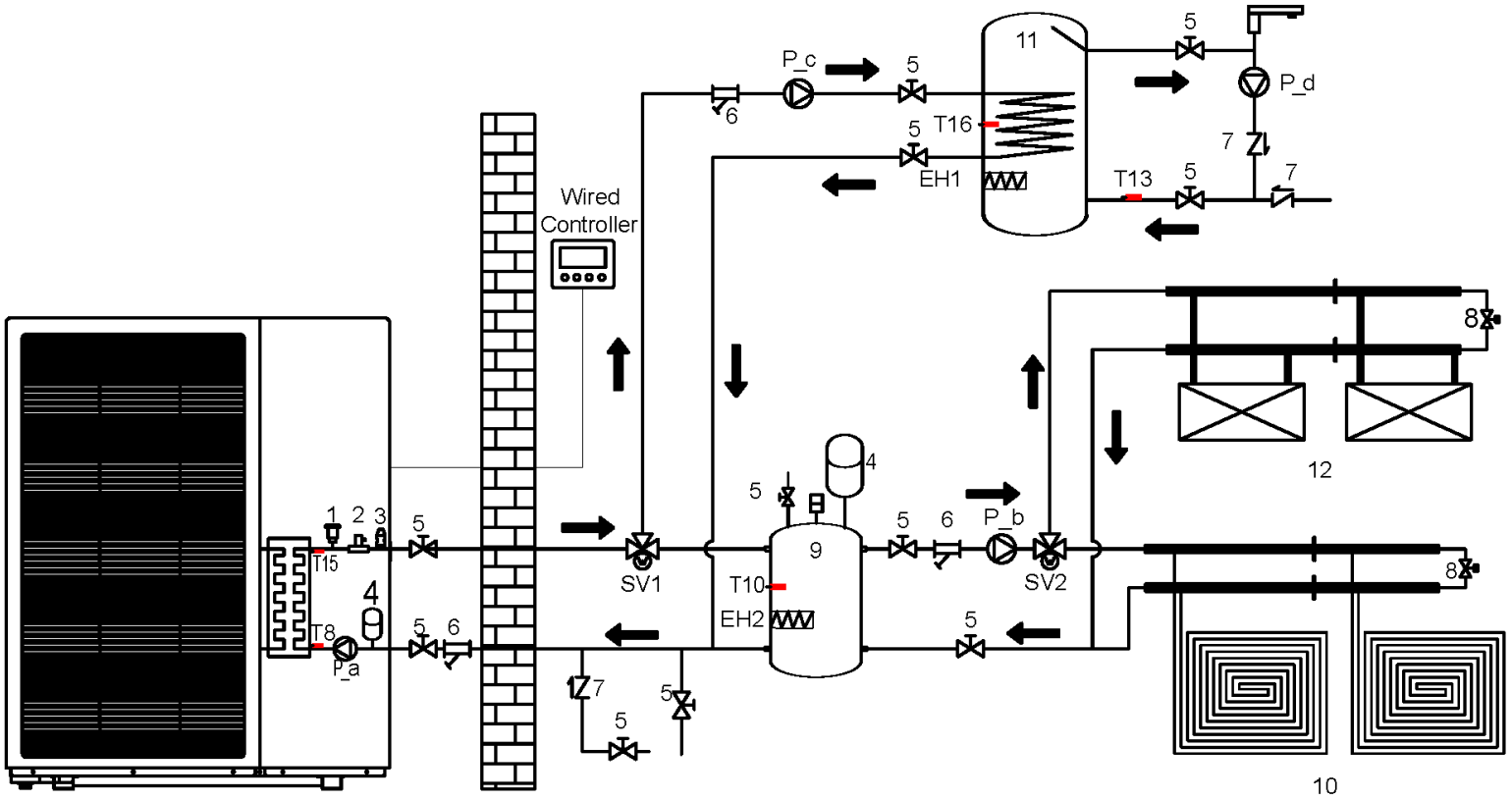
1. If the unit is too far away from the buffer tank or the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. If you need to turn on the return function, you need to install this pump.
3. This sensor needs to be enabled when opening 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 DHW 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[1]	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 Outlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
8	Bypass Valves (Field Supply)	T10[2]	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

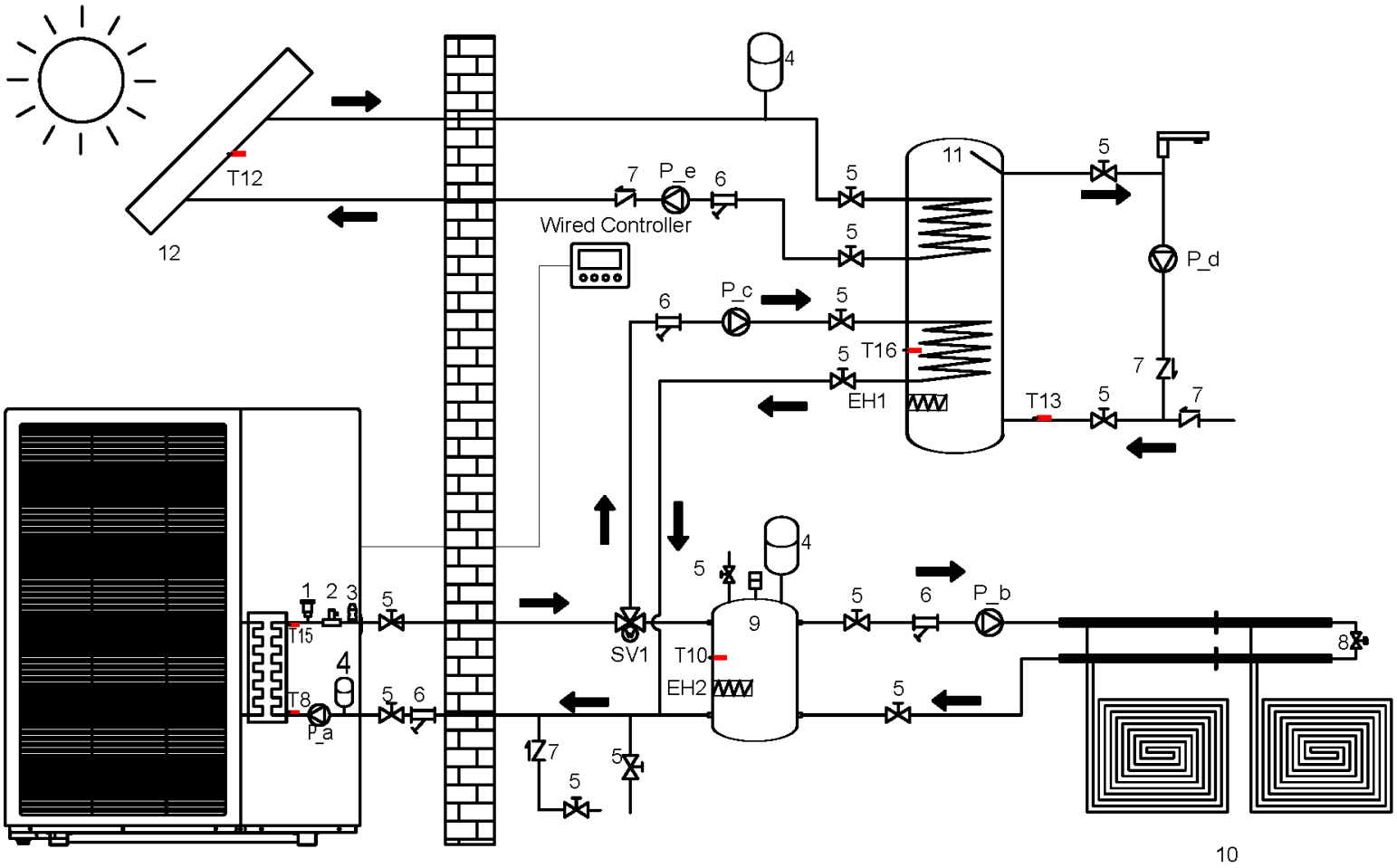


Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set.
Refer to section 2.5 for wiring

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T13[4]	DHW Return Temp. 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



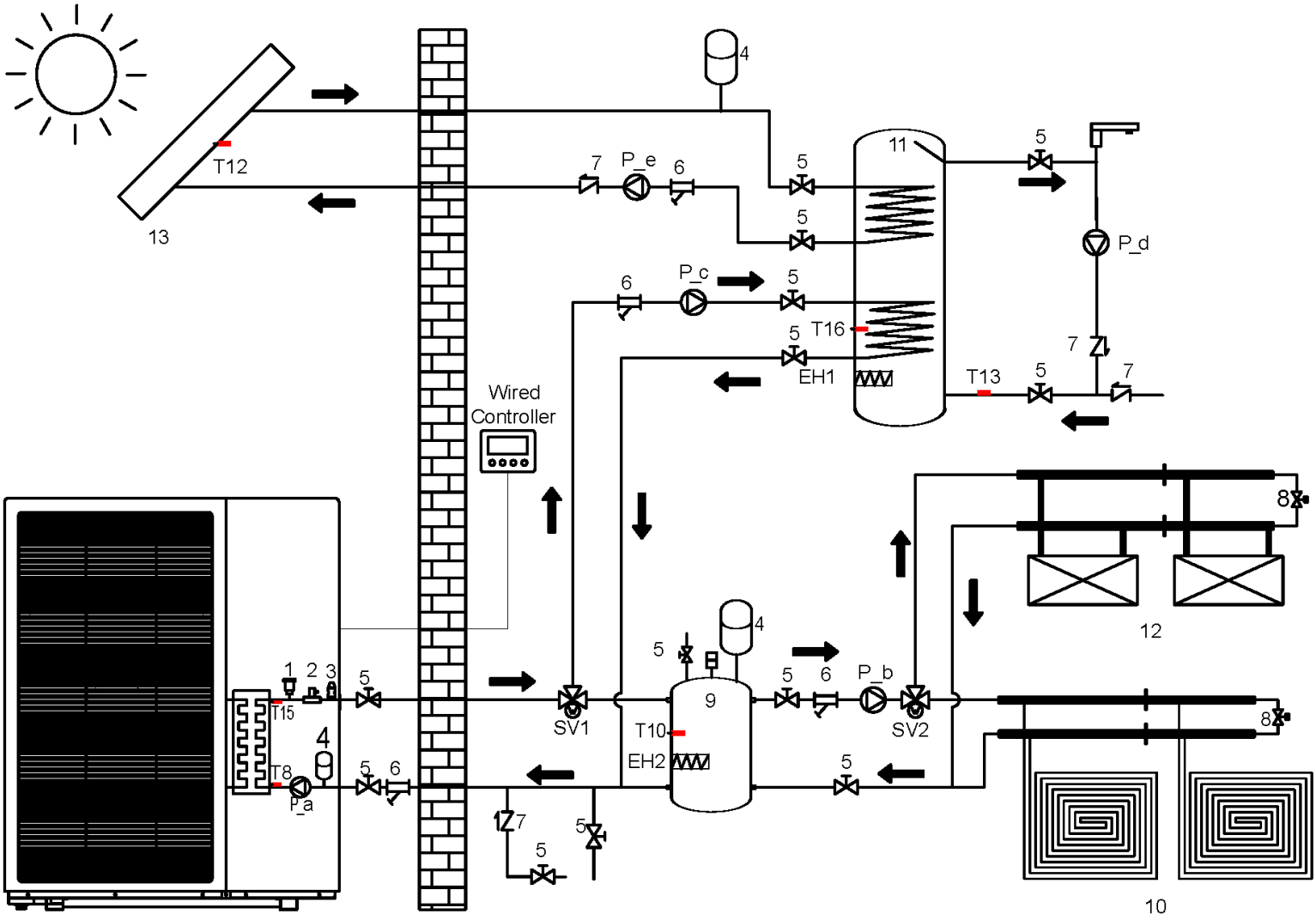
Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
P152=2
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
The water pump is controlled by P151 and P152 parameters. Please refer to Chapter 2.7.3.5 for specific settings.
Refer to 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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
12	Solar Water Heater (Field Supply)	T13[4]	DHW Return Temp. Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)

		T12	Solar Water Heater 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 DHW 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.

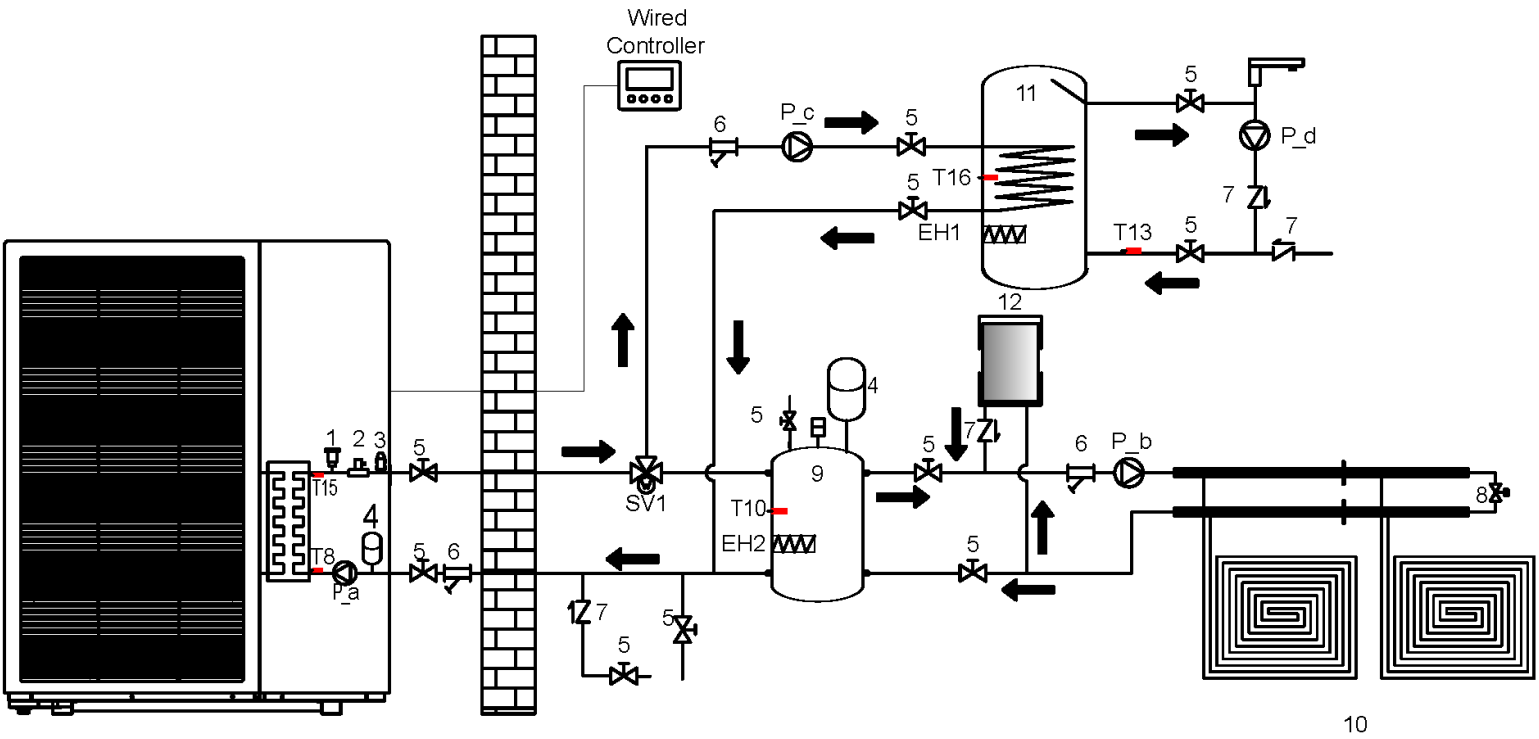
No.	Name	No.	Name
1	Air Vent Valve (Built-in)	P_a	Built-in Water Pump (Built-in)
2	Water Flow Switch (Built-in)	P_b	Heating/Cooling Water Pump (Field Supply)
3	Safety Valves (Built-in)	P_c[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	Return Water Pump (Field Supply)

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 Outlet Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T8	Water Intlet Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
13	Solar Water Heater (Field Supply)	T13[4]	DHW Return Temp. Sensor (Built-in)
		T16	DHW Tank Temp. Sensor (Built-in)
		T12	Solar Water Heater 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.

2.6.2 Heat Pump & AHS System Solutions

2.6.2.1 AHS (Heating)

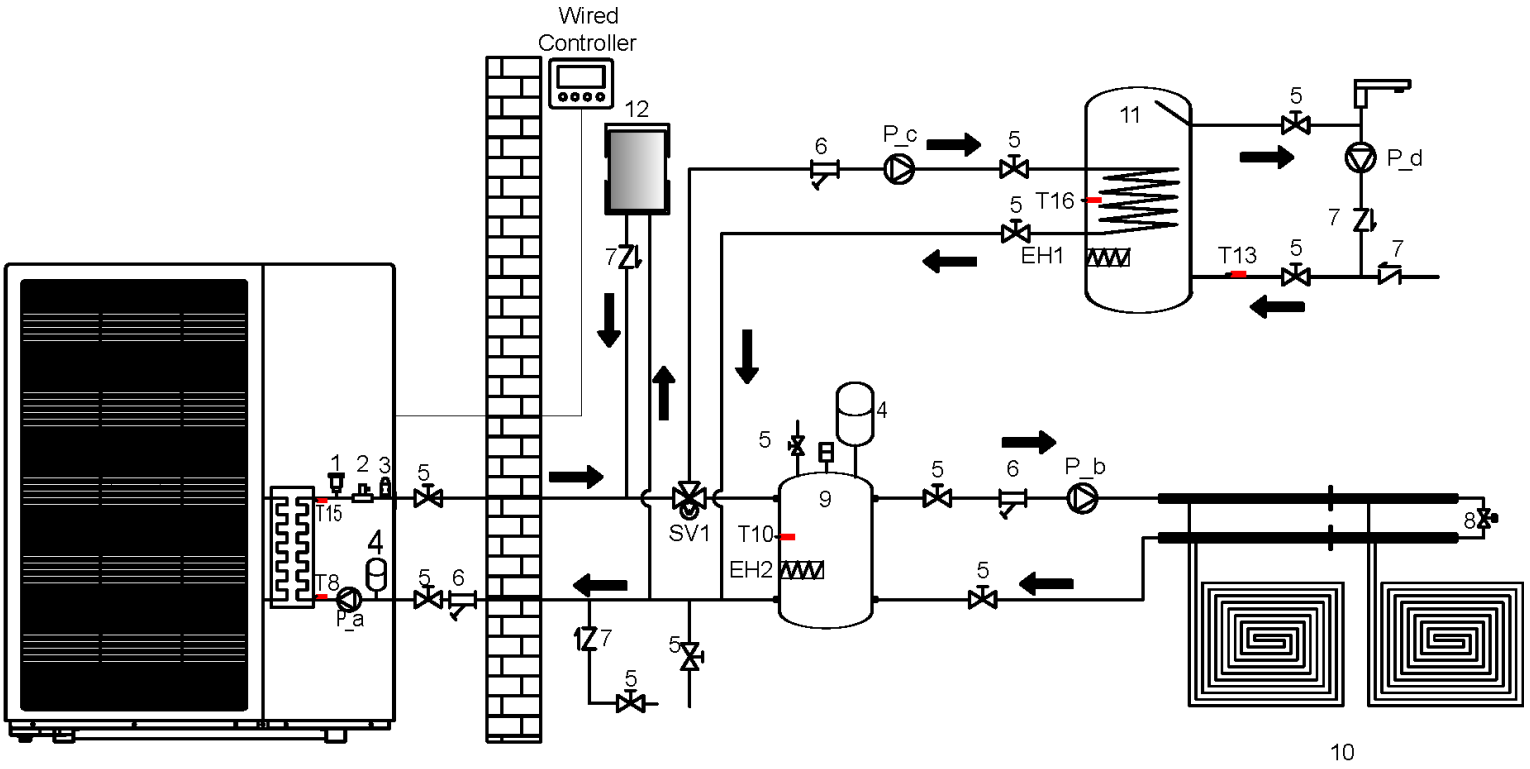


Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
The AHS setting please refer to Chapter 2.7.2.1 for specific settings.
Refer to section 2.5 for wiring and parameter setting.

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13[4]	DHW Return Temp. 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)

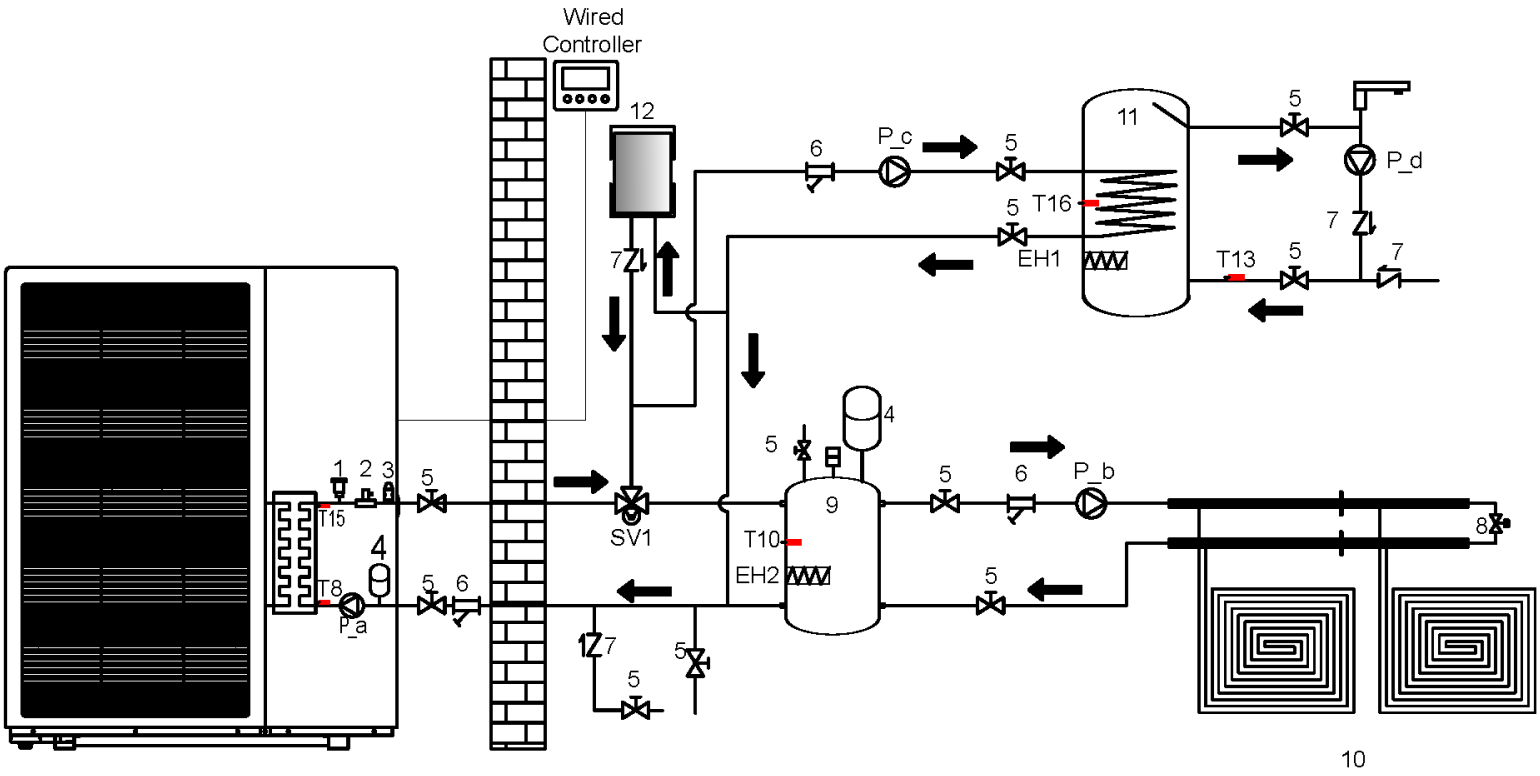


Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
The AHS setting please refer to Chapter 2.7.2.1 for specific settings.
Refer to section 2.5 for wiring and parameter setting.

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13[4]	DHW Return Temp. 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)



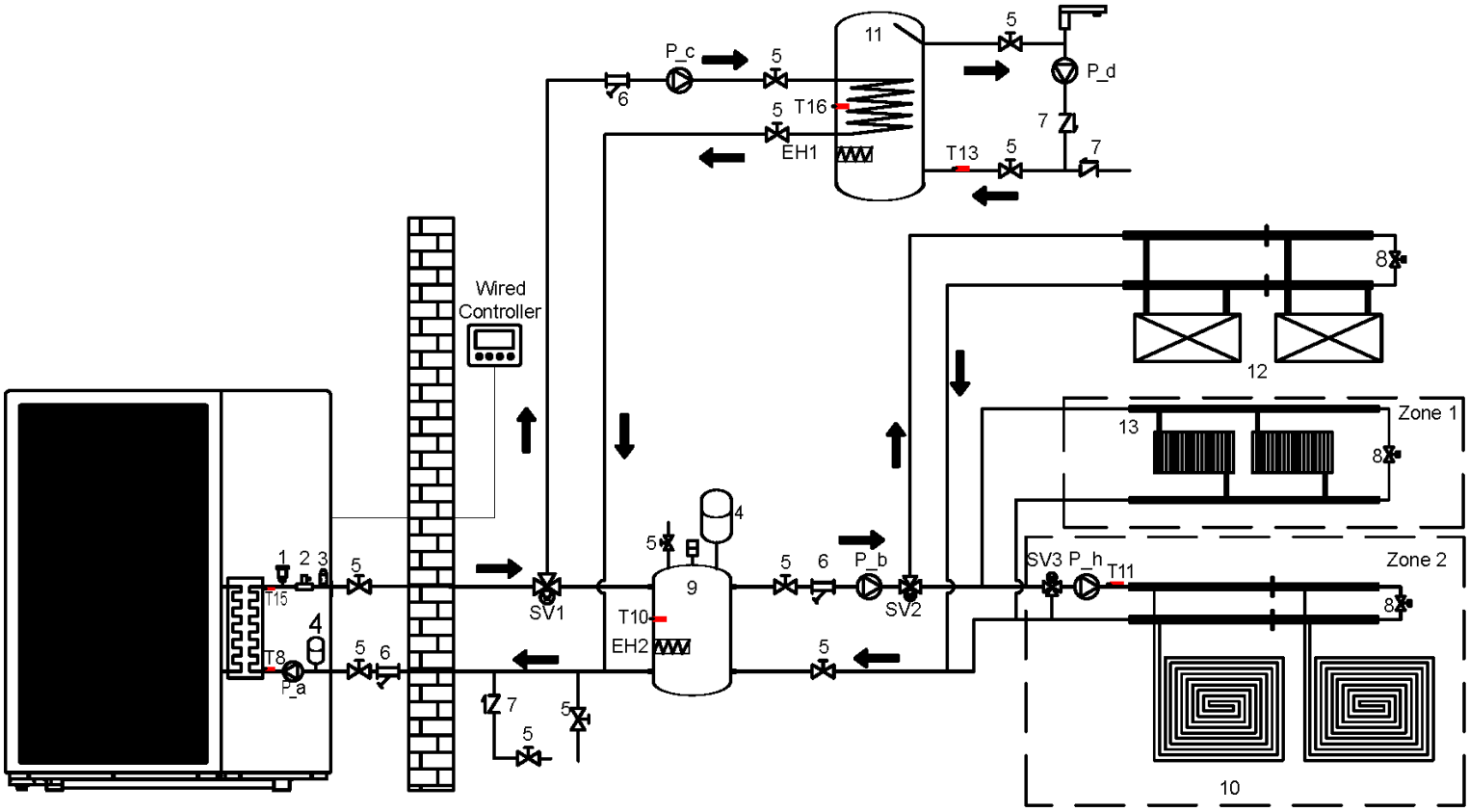
Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
The AHS setting please refer to Chapter 2.7.2.1 for specific settings.
Refer to section 2.5 for wiring and parameter setting.

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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
9	Buffer Tank (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
10	Underfloor Heating (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
11	DHW Tank (Field Supply)	T13[4]	DHW Return Temp. 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



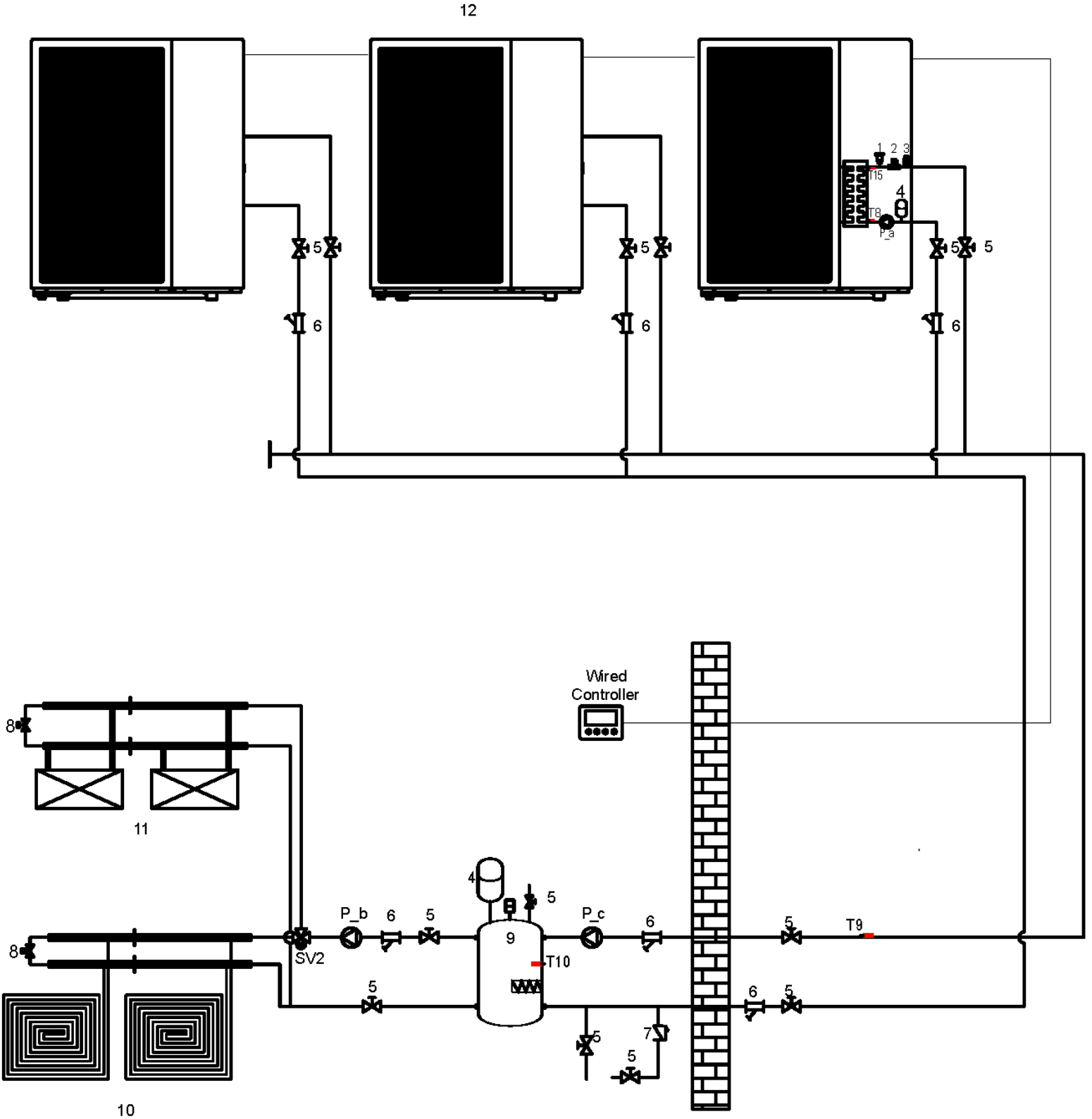
Parameter Settings:
P48=1 Enable DHW Tank Temperature Sensor
L12=0 Enable sterilization
L22 is the return water parameter setting, please refer to section 2.7.3.4 to set it.
The AHS setting please refer to section 2.7.2.1 for specific settings.
Please refer to section 2.7.5 for dual temperature zone 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[1]	Auxiliary Water Pump (Field Supply)
4	Expansion Tank (Built-in)	P_d[2]	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 Outlet Temp. Sensor (Built-in)
12	Fan Coil (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
13	Radiator (Field Supply)	T10[3]	Buffer Tank Temp. Sensor (Built-in)
		T13[4]	DHW Return Temp. Sensor (Built-in)

		T16	DHW Tank Temp. Sensor (Built-in)
		T11[5]	Zone 2 Temp. Sensor

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 water 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.
5. This sensor needs to be enabled when dual temperature zone control is turned on to control the temperature of Zone 2.
***NOTE：** The installation diagram is for reference only and installation is subject to actual conditions.*

2.6.4 Cascade Solutions



Parameter setting:
P48=0 disable DHW 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[1]	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 Outlet Temp. Sensor (Built-in)
7	Non-Return Valves (Field Supply)	T8	Water Inlet Temp. Sensor (Built-in)
8	Bypass Valves (Field Supply)	T10[2]	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[3]	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 **(RPM=Hz*15)**
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

Parameter		Default Value/Range/Unit	Description	Note
	L16	70 (50-80）/℃	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 ℃ 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.

The following parameters and conditions control the switching on and off electric heater:

Electric Heater Type	Turn On	Turn Off
EH2	Ambient Temperature≤P22 And Water Inlet Temperature<Setting Temperature-P26	Ambient Temperature≥P22+3 Or Reach Setting Temperature
EH1	Ambient Temperature≤P22 And DHW Tank Temperature<Setting Temperature-P96	DHW Tank Temperature ≥ Setting Temperature
NOTE: ***P22=-7 ℃(Default);P26=5 ℃(Default);P96=5 ℃(Default)***		

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 (Default)	Enable buffer tank electric heater
	1	Disable buffer tank electric heater
	2	Enable auxiliary heat source for heating
P140	0 (Default)	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:

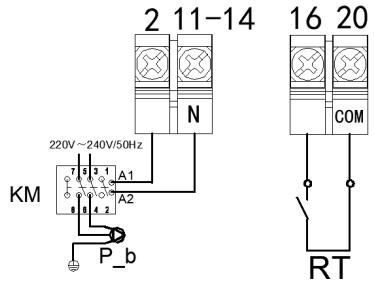
Parameter	Setting Value	Description	Note
P28	0	Water pump run continuously after the unit reaches the target temperature	
	1 （Default）	After the unit reaches the target temperature, water pump runs at a cycle of 2Min every 10Min.	
	2	In cooling mode, the water pump runs continuously after the unit reaches 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

In addition, P_a water pumps use different brands and models of water pumps, the corresponding P146 parameters are not the same, if the maintenance of the replacement of different brands of water pumps, you need to follow the table corresponding to the model and parameter settings.

Water Pump		Unit	P146
Brand	Model		
SHIMGE	APM25-9-130	HH-C1-6 HH-C1-8 HH-C3-8 HH-C1-12 HH-C3-12	66
	APF25-12-130EFPWM1	HH-C1-18 HH-C3-18	62
GRUNDFOS	UPM3K/25-75/130	HH-C1-6	66
	UPML/25-105/130	HH-C1-8 HH-C3-8 HH-C1-12 HH-C3-12	66
	UPMXL/25-125/130	HH-C1-18 HH-C3-18	62
NOTE: *P146 is set correctly for correct flow feedback from water pumps.*			

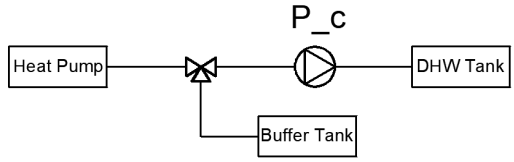
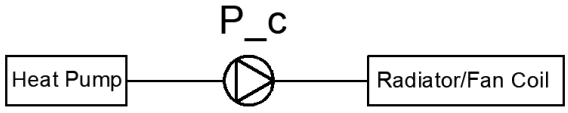
2.7.3.2 Heating/Cooling Water Pump (P_b)

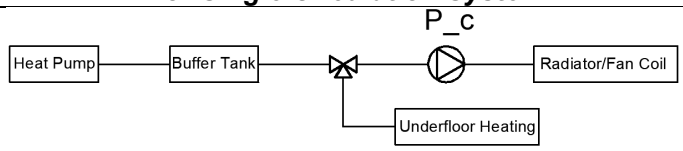
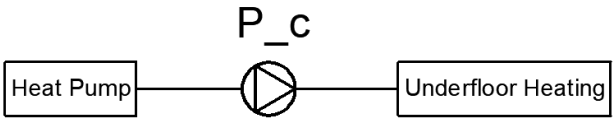
The water pump is used as a circulating water pump in the heating circuit and the mode of operation is controlled by parameter P150, the settings of which are shown in the table below:

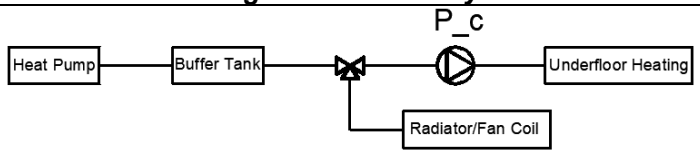
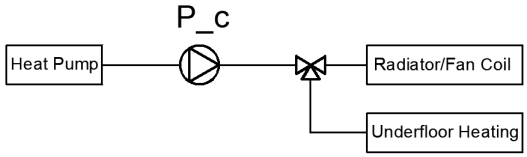
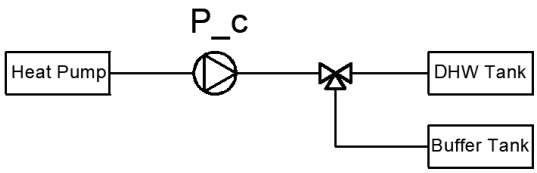
Parameter	Setting Value	Description	Note
P150	1	The water pump starts when the unit is turned on or when it reaches temperature and stops.	
	2 (Default)	The water pump is controlled via room thermostat	***When P150=2, it is necessary to connect the room thermostat*** 
	3	The water pump is controlled via the wired controller	Wired 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.

<table>
<tr><th>Parameter</th><th>Setting Value</th><th>Description</th><th>Diagram</th></tr>
<tr><td rowspan="5">P161</td><td>0 (Default)</td><td>Auxiliary pumps for DHW</td><td> 
</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Auxiliary pumps for cooling/heating circuits</td><td> 

For Single Circulation System
 
</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Auxiliary pumps for underfloor heating</td><td> 

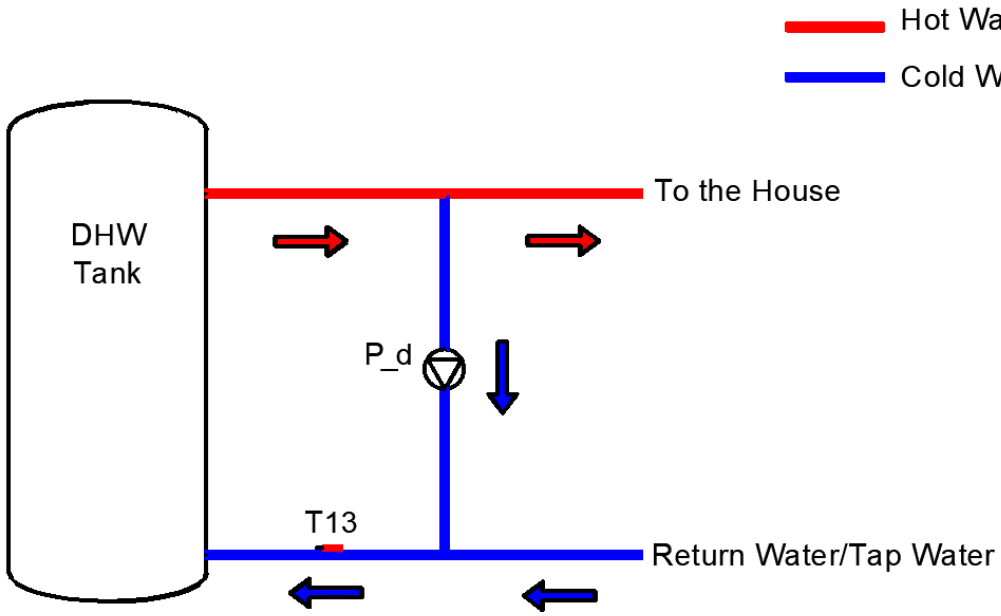
For Single Circulation System
 
</td></tr>
<tr><td>3</td><td>Auxiliary pumps for cooling/heating and underfloor heating circuits</td><td> 
</td></tr>
<tr><td>4</td><td>Auxiliary pumps for unit circulation</td><td> 
</td></tr>
<tr><td colspan="4">NOTE: When running the corresponding mode, when the main unit circulation pump starts, the unit auxiliary pump starts at the same time.</td></tr>
</table>

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. Currently, 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 ≤ L23-L24, then enable the water return function, and stop after reaching the temperature	L23：Default 40℃(20-65℃) L24: Default 5℃(1-15℃)

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 40℃, the return function will be enabled when the temperature in the water pipe is lower than 40-5=35℃, and will be turned off when the water temperature reaches 40℃.



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）/℃	DHW tank heat source return temperature	When the solar water heater water pump is used in the hot water tank
P152	10（0-40）/℃	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 (Buffer Tank)	7#	0V	
	8#	230V	
NOTE: When repairing, you can use a multimeter to detect whether the heat pump has normal voltage output to the three-way valve			

2.7.4.2 SV2#Three-Way Valve

This three-way valve is used to switch fan coil- underfloor heating, when switching working mode, 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
Underfloor Heating	9#	230V	Type 1
	10#	0V	
Fan Coil (Heating/Cooling)	9#	0V	
	10#	230V	
NOTE: When repairing, you can use a multimeter to detect whether the heat pump has normal voltage output to the three-way valve			

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	
NOTE: When repairing, you can use a multimeter to detect whether the heat pump has normal voltage output to the three-way valve			

2.7.5 Linkage Switch

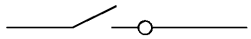
The linkage switch is a dry contact signal, indicating both open and closed states.

Terminal Block No.	Description	Operating Principle	Note
15-20	Forced Cooling Switch	When closed, the unit running cooling mode, typically used to connect thermostats that can switch between operating modes	Open by default, no parameter setting required
16-20	Linkage Switch (External Water Pump)	Used to connect room thermostat to control the P_b Water Pump turn ON/OFF	
17-20	Forced Heating Switch	When closed, the unit running heating mode, typically used to connect thermostats that can switch between operating modes	
18-20	Linkage Switch (Heat Source of DHW)	Usually used to connect solar water heater	
19-20	Linkage Switch	Used to connect room thermostat, to control the unit, setup parameters refer to section 2.7.5.1	Controlled by parameter P05
NOTE: There is no voltage output from the linkage switch, it is just a passive signal.			

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	Example
P05	0 (Default)	**Enable** the linkage switch Closed: Turn on Opened: Turn off (DHW included)	When the linkage switch is closed, the heat pump will turn on when there is a demand to turn on the heat pump. When the linkage switch is opened, the heat pump will not turn on, and will not turn on when there is a demand for DHW
	1	**Disable** the linkage switch	**Disable** the linkage switch

	2	**Enable** the linkage switch Closed: Turn on Opened: Unit enter the standby mode	When the linkage switch is closed, the heat pump will turn on when there is a demand to turn on the heat pump. When the linkage switch is opened, the heat pump enters standby mode, but the water pump operates in the mode that has been set.
	3	**Enable** the linkage switch Closed: Turn on Opened: Turn off (DHW not included)	When the linkage switch is closed, the heat pump will turn on when there is a demand to turn on the heat pump. When the linkage switch is opened, the heat pump will not turn on, but when there is a demand for DHW, it will switch to DHW mode operation
Opened 			Closed

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: T11: Enable temperature zone 2 temperature. T10: Enable buffer tank temperature
	1	Enable dual temperature zones on demand	
	2 （Default）	Disable dual temperature zones	
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℃	Loaded unit return temperature	Controls whether to turn on the next unit
P166	2℃	Derating unit return temperature	Controls whether to turn off the next unit

P167	3℃	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
NOTE: *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 and the water outlet temperature. The parameter of the unit is as follows:

Parameter	Setting Value	Description
P117	5℃(0℃-10℃)	Ambient temperature for antifreeze protection
P118	3℃(0℃-20℃)	Water outlet temperature for anti-freeze protection
P29	2min(0min-20min)	Water pump runtime with freeze protection

The heat pump will judge whether to enter the anti-freeze protection according to the ambient temperature and water temperature under standby condition, and the unit has two levels of anti-freeze protection, which correspond to different operation modes. When the hot water function is turned on, it will increase the domestic hot water tank temperature determination. Please refer to the following table for detail:

Anti-Freeze Level	Type	Entry Condition	Exit Condition	Unit Operate in Anti-Freeze Protection
I	Heating	Ambient Temp. ≤P117	Ambient Temp. ≥P117+3℃	P_a pumps every 10 minutes then run P29 minutes
II	Heating	Ambient Temp. ≤P117 **and** Water Outlet Temp. ≤P118	Ambient Temp. ≥P117+3℃ **or** Water Outlet Temp. ≥15℃	Running heating mode and turn on electric heater
	Heating + DHW	Ambient Temp. ≤P117 **and** DHW Water Tank Temp. ≤P118	Ambient Temp. ≥P117+3℃ **or** Water Outlet Temp. ≥P118+12℃	Running heating mode and turn on electric heater
** Please note that if the unit is running in standby mode, it is possible that it has entered the freeze protection mode.*				

2.8 Basic Running Logic & Setting

This chapter mainly explains the basic operation logic of the unit, including the heating mode of the unit, the startup and shutdown conditions of the cooling mode and hot water mode, the operation mode of the unit after it reaches the set temperature, and the water temperature control mode of the unit, etc. The following will be an explanation of some of the terms and parameters used, so that the corresponding parameters can be better understood and set.

Parameter	Description	Explanation
P26	*Temperature difference of heating and cooling(ΔT_{P26})	It is used to control the on/off parameter in heating mode or cooling mode, when the current water temperature of the unit is greater than the sum of the set water temperature and the parameter or less than the difference between the set water temperature and the parameter, the unit will be on/off.
P27	*Temperature difference of underfloor heating(ΔT_{P27})	It is used to control the on/off parameter in floor heating mode, when the current water temperature of the unit is greater than the sum of the set water temperature and this parameter or less than the difference between the set water temperature and this parameter, it will enter on/off.
P37	When the unit reaches the set temperature, choose to control the operation mode of the compressor	0: The unit will not shut down immediately after reaching the set temperature, and it needs to be determined whether to shut down or not according to the running frequency and length of the compressor.
		1: Shutdown after reaching the target water temperature, the unit will shut down immediately after reaching the set temperature.
		2: The unit will enter the intelligent shutdown mode when running the cooling mode and will enter the temperature shutdown when running the heating mode.
P96	*Temperature difference of DHW(ΔT_{P96})	It is used to control the on/off parameter in DHW mode
P116	Unit temperature control mode	1: The unit is controlled by the water **OUTLET** temperature, at this time the real-time temperature displayed on the wired controller is the water temperature at the water outlet of the unit.
		0: The unit is controlled by the **INLET** water temperature, at this time the real-time temperature displayed on the wired controller is the water temperature at the inlet of the unit.
** Temperature Difference: To prevent the unit from frequent off and on, this parameter is set to regulate the unit off and on.* *Note：* ***P26=0℃（Default）;P27=0℃（Default）;P96=5℃（Default）;P116=1（Default）***		

2.8.1 Temperature Difference Setting (ΔT)

In general, this parameter is not recommended to be changed, and this section describes the basic settings of the temperature difference. The following is expressed using ΔT.

When running hot water mode, the temperature differential setting is parameter P96.

When running the heating mode, the temperature differential setting is parameter P26. At this time, when P26 $\neq$ 0, the unit's temperature differential is set according to P26; when P26 = 0, the unit's temperature differential value is calculated by the following formula:

$$\Delta T_{P26} = \frac{Water\ Inlet\ Temperature}{10}$$

ΔT_{P26} calculated then take 2°C-5°C

For example, if current water inlet temperature is 46°C, then ΔT_{P26}=4.6°C=4°C

When running the cooling mode, the temperature difference is set with parameter P26, at this time, when P26 ≠ 0, the temperature difference of the unit is set according to P26; when P26 = 0, the value of the temperature difference of the unit is calculated by the following equation：

$$\Delta T_{P26} = 5 - \frac{Water\ Inlet\ Temperature}{10}$$

ΔT_{P26} calculated then take 2°C-5°C

For example, if current water inlet temperature is 15°C, then ΔT_{P26}=1.5°C=1°C

When running the underfloor heating mode, the temperature difference is set with parameter P27, at this time, when P27 ≠ 0, the temperature difference of the unit is set according to P27; when P27 = 0, the value of the temperature difference of the unit is calculated by the following equation：

$$\Delta T_{P27} = \frac{Water\ Inlet\ Temperature}{10}$$

ΔT_{P27} calculated then take 2°C-5°C

For example, if current water inlet temperature is 36°C, then ΔT_{P27}=3.6°C=3°C

Parameter P26/P27 is factory set to 0℃, so the temperature difference of the unit is calculated according to the inlet water temperature.

2.8.2 Heating Mode

When the unit is running the heating mode, please refer to the following table for the unit's on and off conditions：

P116	P37	Turn On Condition	Turn Off Condition
1 (Default)	0 (Default)	Water Outlet Temperature < Setting Temperature - ΔT_{P26} -* ΔT ***ΔT =Water Outlet Temperature – Water Inlet Temperature (Temperature difference at heat pump shutdown)***	Water outlet temperature ≥ setting temperature and compressor at the lowest frequency (Fmin) continuous operation ≥ 5min **Or** Water outlet temperature ≥ Setting temperature +3°C
	1/2		Water outlet temperature≥Setting temperature
0	0	Water Inlet Temperature < Setting Temperature- ΔT_{P26}	Water inlet temperature ≥ setting temperature and compressor at the lowest frequency (Fmin) continuous operation ≥ 5min **Or**

			Water inlet temperature ⩾ Setting temperature +3°C
	1/2		Water inlet temperature⩾Setting temperature

2.8.3 Underfloor Heating Mode

When the unit is running the underfloor heating mode, please refer to the following table for the unit's on and off conditions：

P116	P37	Turn On Condition	Turn Off Condition
1 (Default)	0 (Default)	Water Outlet Temperature < Setting Temperature - △ T_{P27} -* △ T ***⊿T =Water Outlet Temperature – Water Inlet Temperature (Temperature difference at heat pump shutdown)***	Water outlet temperature ⩾ setting temperature and compressor at the lowest frequency (Fmin) continuous operation ⩾ 5min **Or** Water outlet temperature ⩾ Setting temperature +3°C
	1/2		Water outlet temperature⩾Setting temperature
0	0	Water Inlet Temperature < Setting Temperature - △ T_{P27}	Water inlet temperature ⩾ Setting temperature and compressor at the lowest frequency (Fmin) continuous operation ⩾ 5min **Or** Water inlet temperature ⩾ Setting temperature +3°C
	1/2		Water inlet temperature⩾Setting temperature

2.8.4 Cooling Mode

When the unit is running cooling mode, please refer to the following table for the unit's on and off conditions:

P116	P37	Turn On Condition	Turn Off Condition
1 (Default)	0/2	Water Outlet Temperature＞ Setting Temperature +ΔT_{P26} +* △ T ***⊿T =Water Outlet Temperature – Water Inlet Temperature (Temperature difference at heat pump shutdown)***	Water Outlet Temperature ≤ Setting temperature and compressor at the lowest frequency (Fmin) continuous operation ⩾ 5min **Or** Water Outlet Temperature ≤ Setting temperature -3℃
	1		Water Outlet Temperature ≤ Setting temperature
0	0/2	Water Inlet Temperature＞Setting Temperature + △ T_{P26}	Water inlet temperature⩽Setting temperature and compressor at the lowest frequency (Fmin) continuous operation ⩾ 5min **Or** Water inlet Temperature ≤ Setting temperature -3℃

	1		Water Outlet Temperature ≤ Setting temperature

2.8.5 DHW Mode

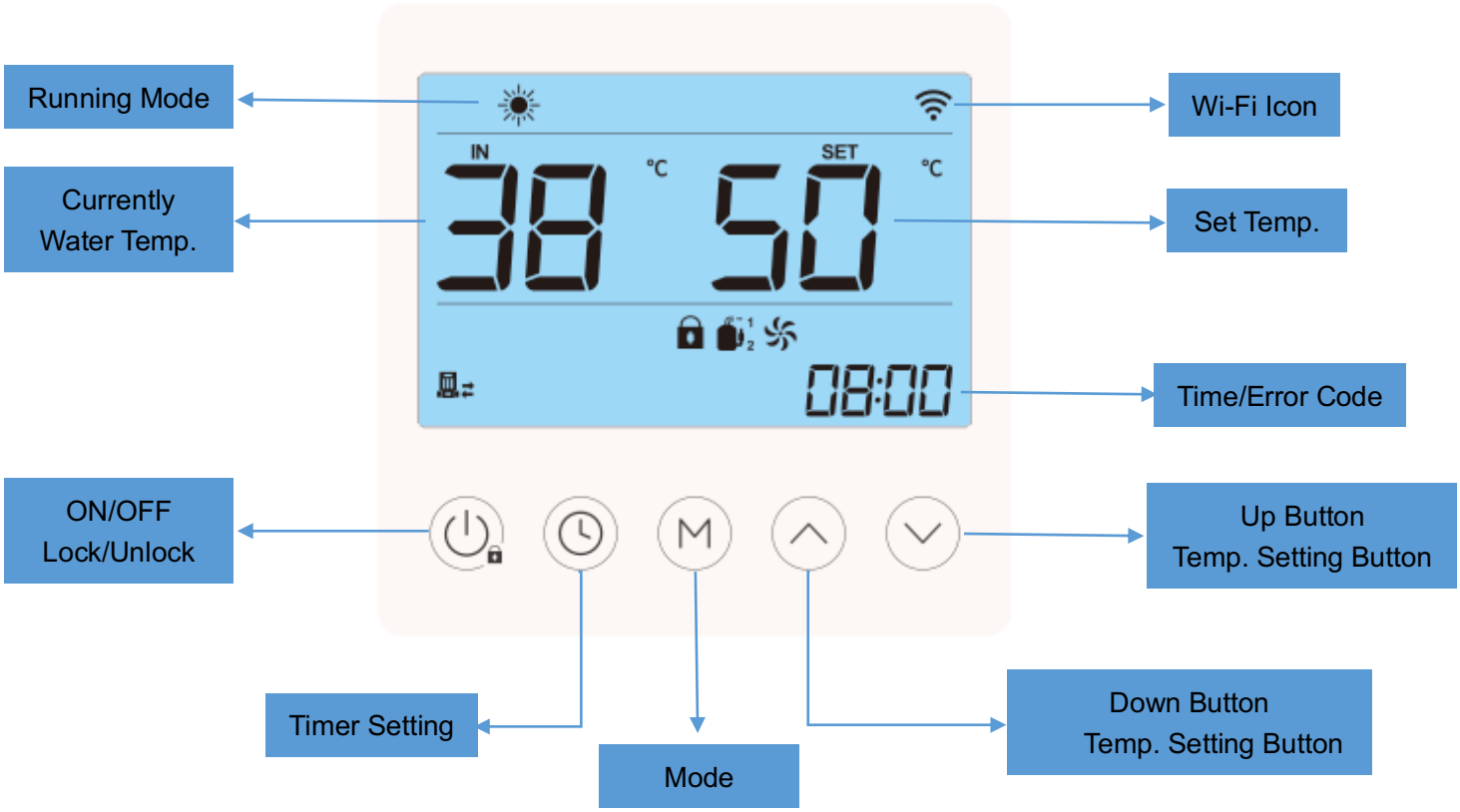
When the unit is running DHW mode, please refer to the following table for the unit's on and off conditions:

Turn On Condition	Turn Off Condition
DHW Tank Temperature＜Setting Temperature-ΔT_{P96}	DHW Tank Temperature≥Setting Temperature
**When the unit is running hot water mode together with other modes, hot water mode is given priority whenever hot water is demanded.*	

3 Wired Controller & Parameters Settings

3.1 Wired 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 wired controller unlocked, press " " and " " at the same time until the " " icon appears on the wired controller and the unit enters the silent mode.

3.1.2.2 Sterilization Mode

ON:

With the wired controller in the unlocked state, press and hold " " and " " and " " at

the same time for 5S until the wired controller appears the "  " icon, the unit enters the sterilization mode.

OFF:

With the wired 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 " 

", 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:

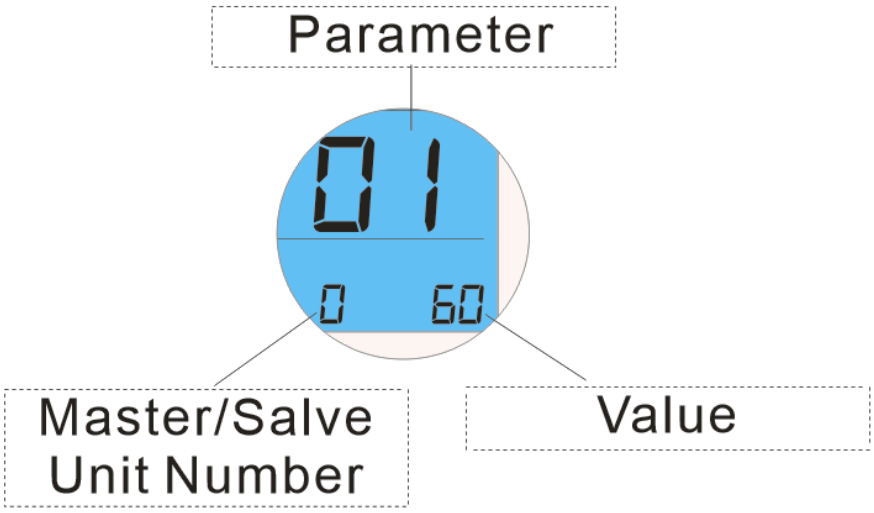
1. Press and hold "  " for 5 seconds to enter the running status query page, and then enter the host status parameter interface "  "

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 "  "

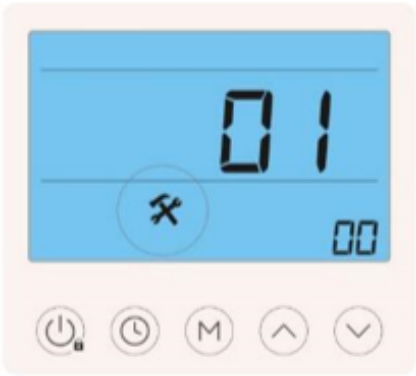
4.Press "  " or "  " to check different parameter of the salve unit

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



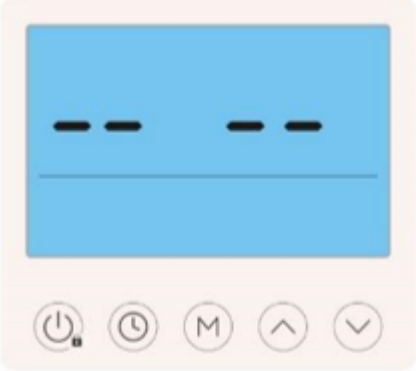
3.1.5 Factory Reset

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.



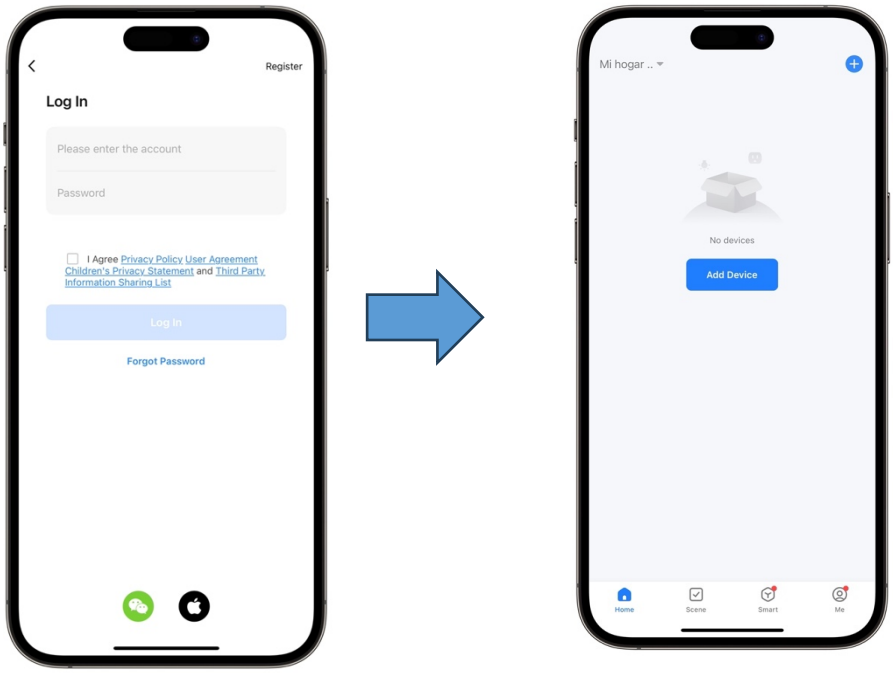
3.1.6 APP & Unit Binding

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.

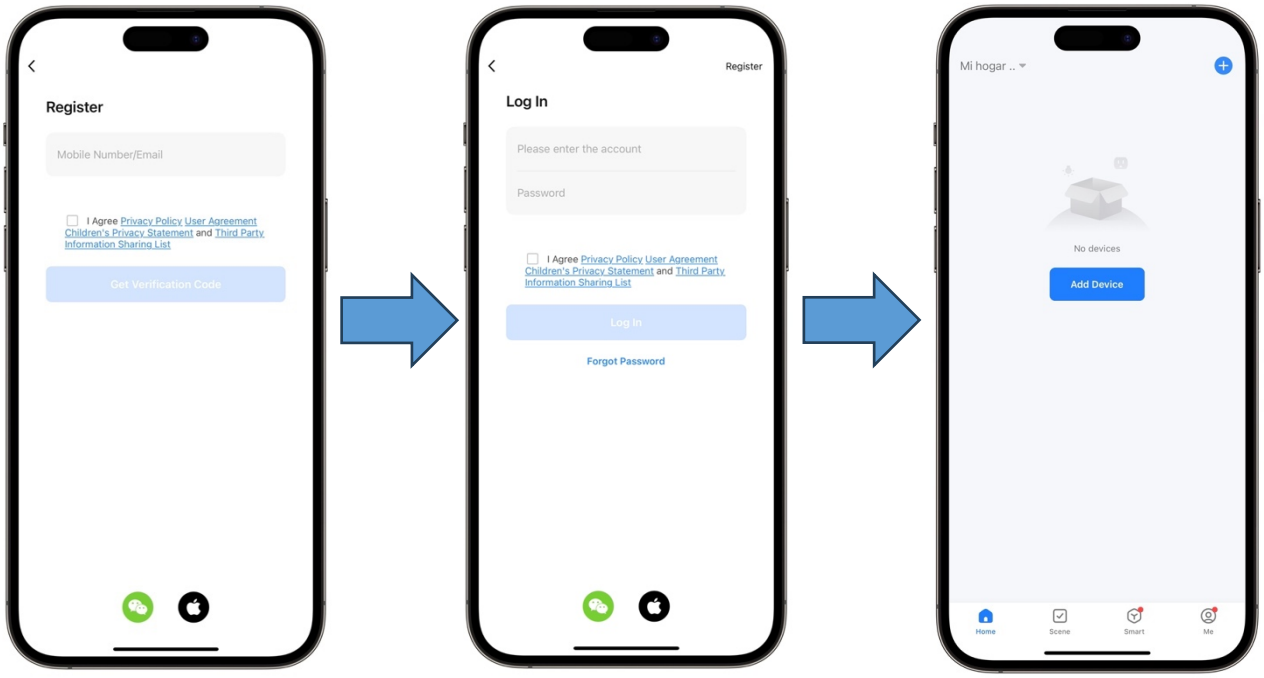
For more APP operations, please refer to "Operation Manual."

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)

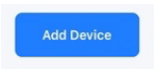
Generally, it is recommended to use smart mode. The wire controller is required to be within WIFI coverage. The wire controller must first enter the network distribution mode.

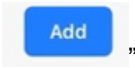
The following is the operation method:

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

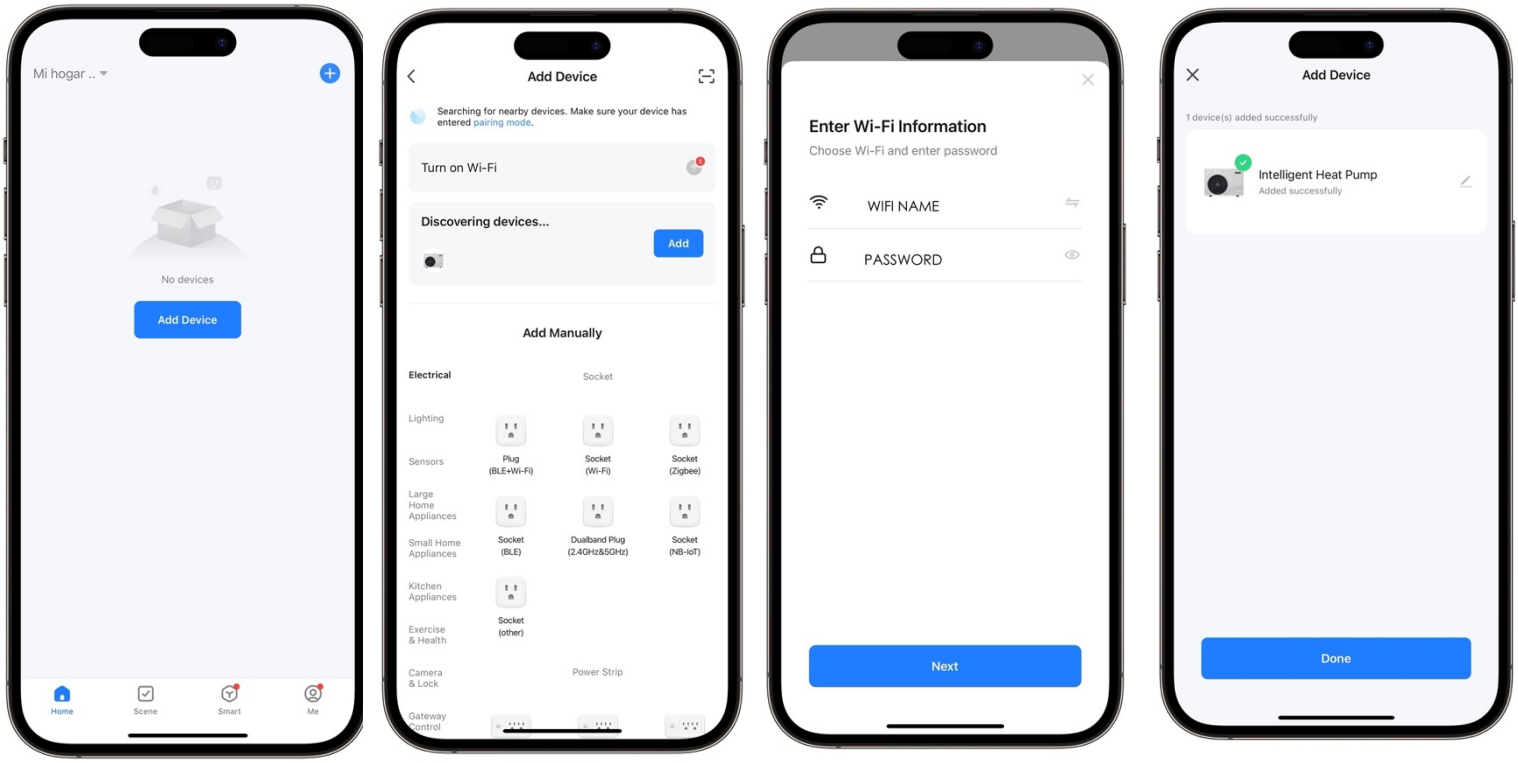
2. When the WiFi icon "  " flashes on the wired controller, release the button to enter the Smart mode.

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.

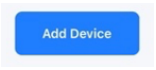
The following is the operation method:

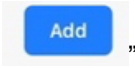
1. In the unlocked state of the wire controller, press "  " and "  " at the same time;

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

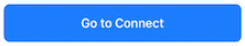
3. At this time, the wire controller will transmit a WIFI hotspot named "smartlife-XXXX" or "SL-XXXX".

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.

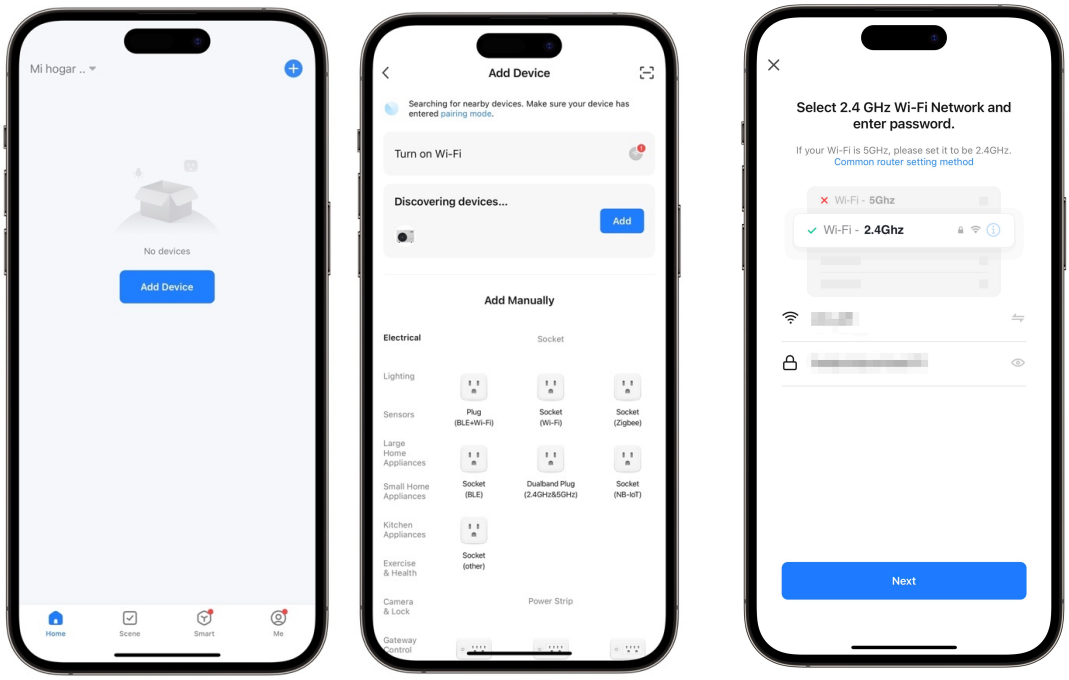
1.Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "  ".

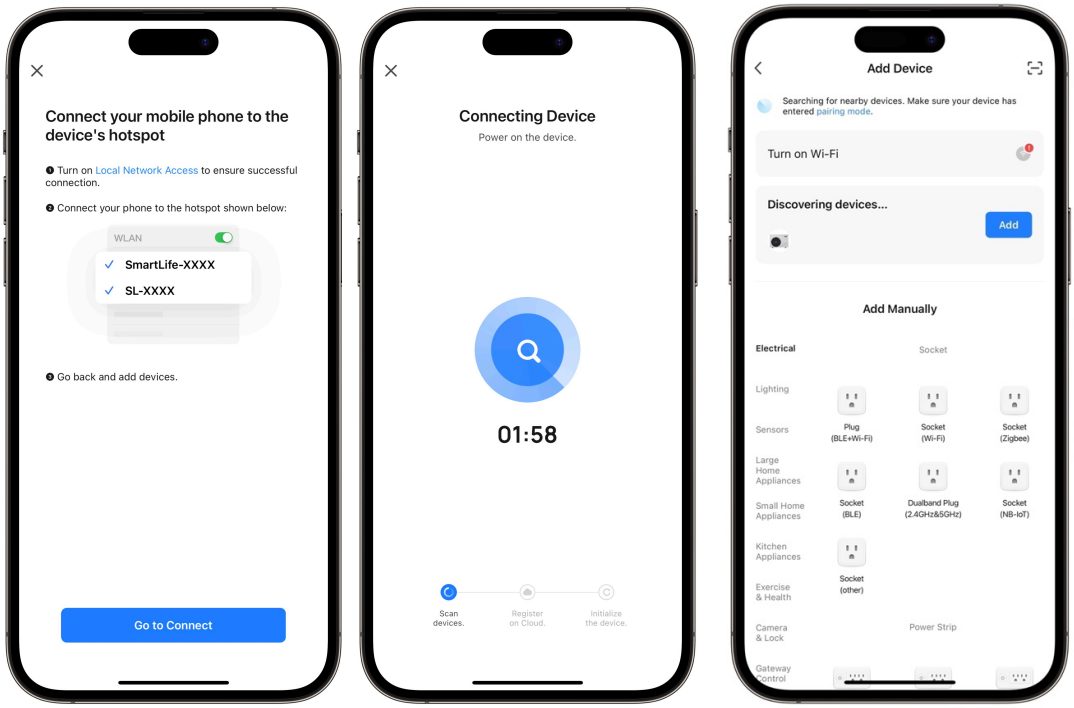
2. In the Smart mode, the APP will automatically identify the device, click "  ".

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



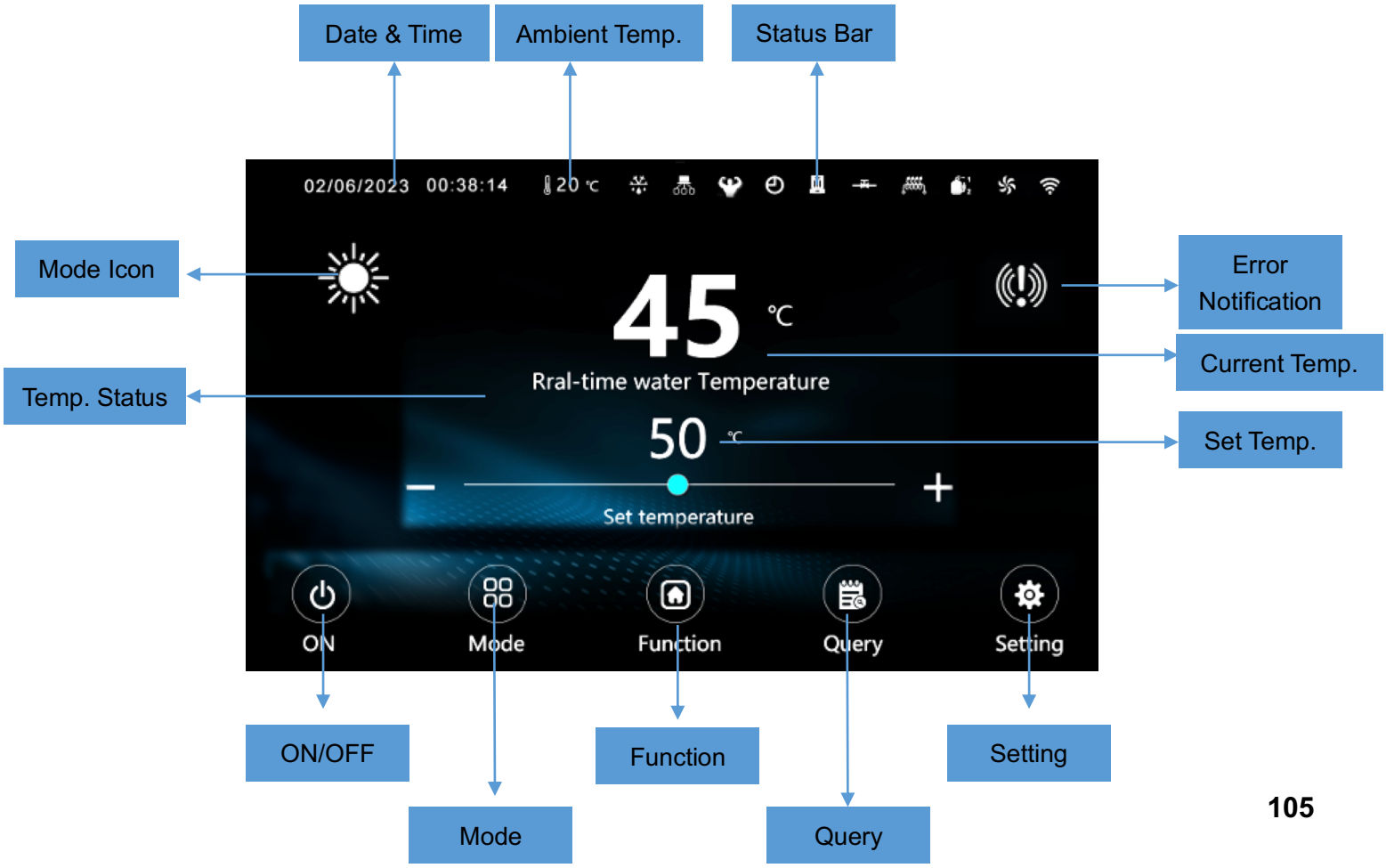


3.2 Wired Controller (TFT)

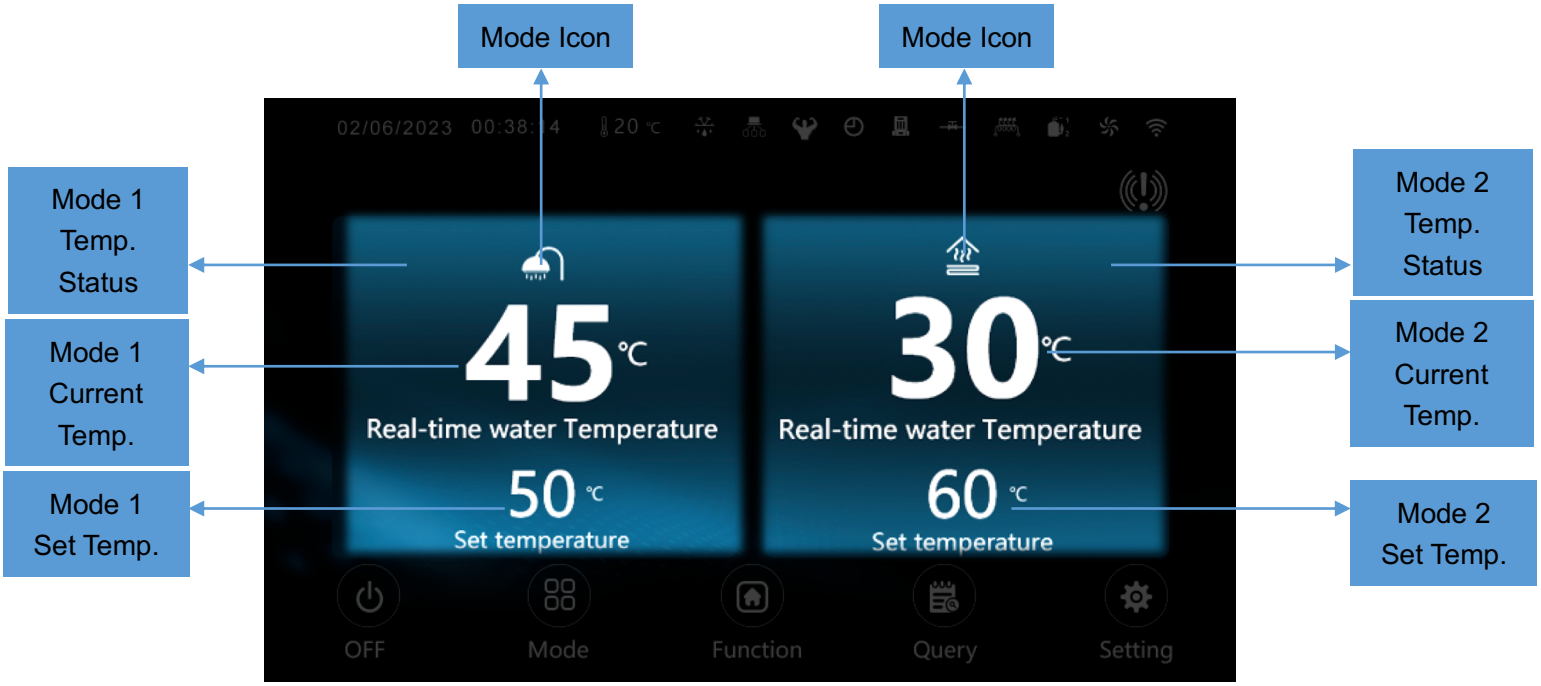
3.2.1 Interface

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

Single mode display page:



Combined mode display page:

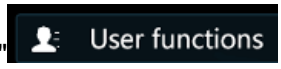


3.2.2 Mode Setting

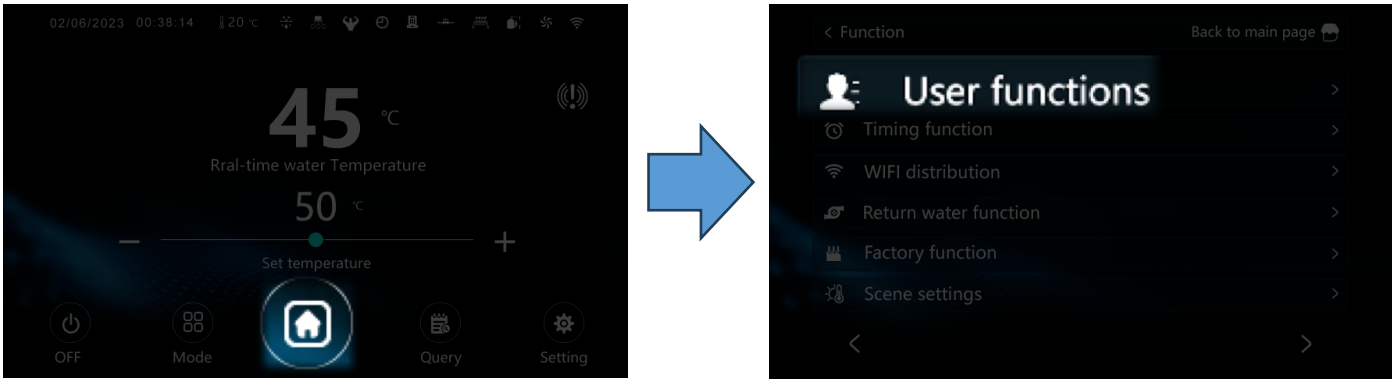
It mainly introduces the operation mode settings introduced in Section 2.7. For more operations or settings, please refer to the "Operation Manual".

Running setting method:

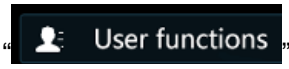
1. Click "  " to enter the user function setting page.

2. Click " 

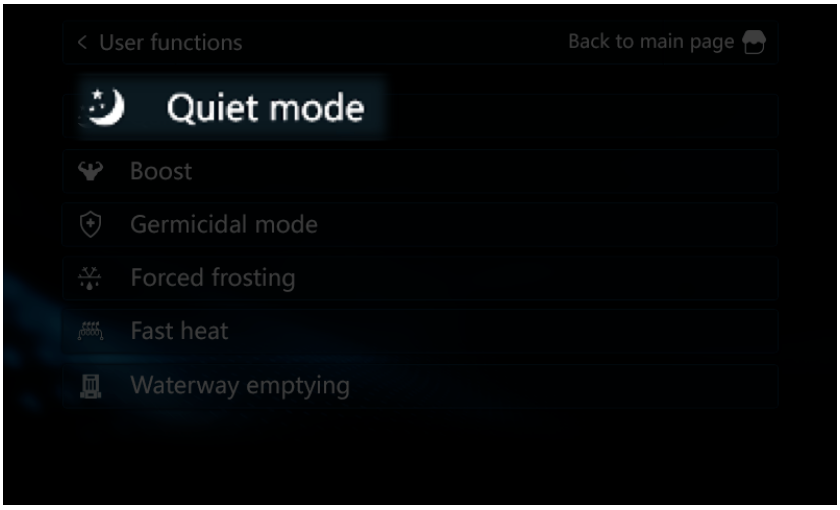
" to enter the mode selection page.



3.2.2.1 Silent Mode

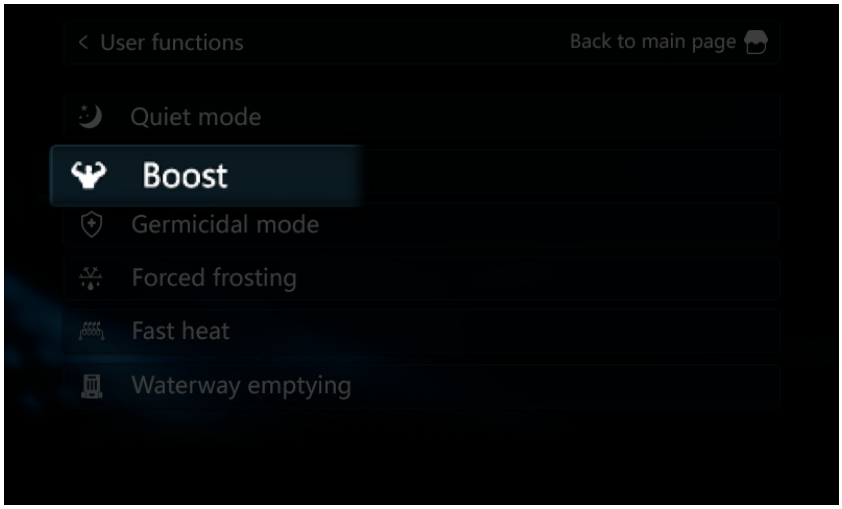
Click " 

"to enter the unit mode selection.



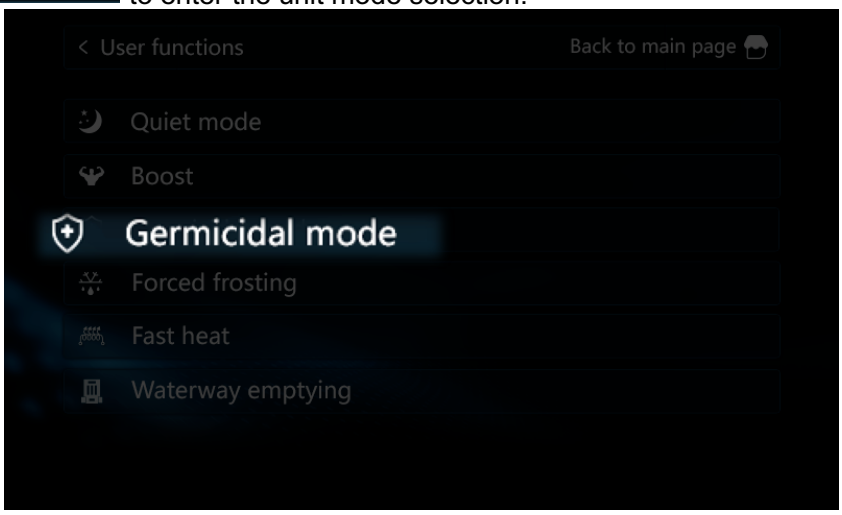
3.2.2.2 Powerful Mode

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



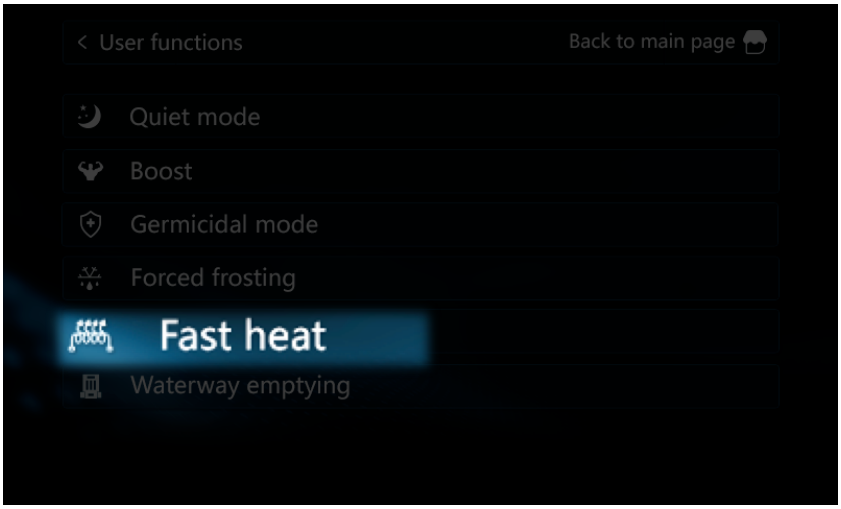
3.2.2.3 Sterilization Mode

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:

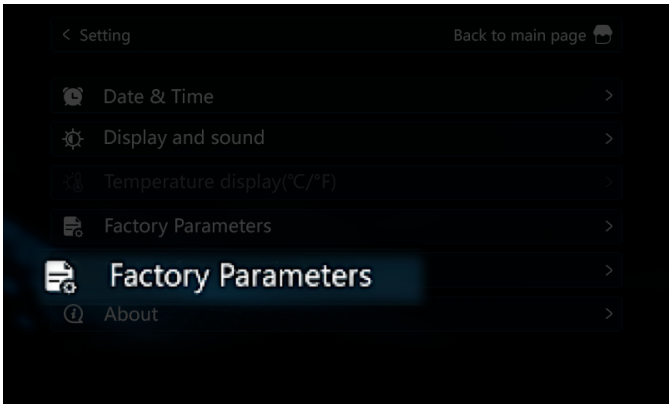
1. Click " Query " to enter the query page.

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。



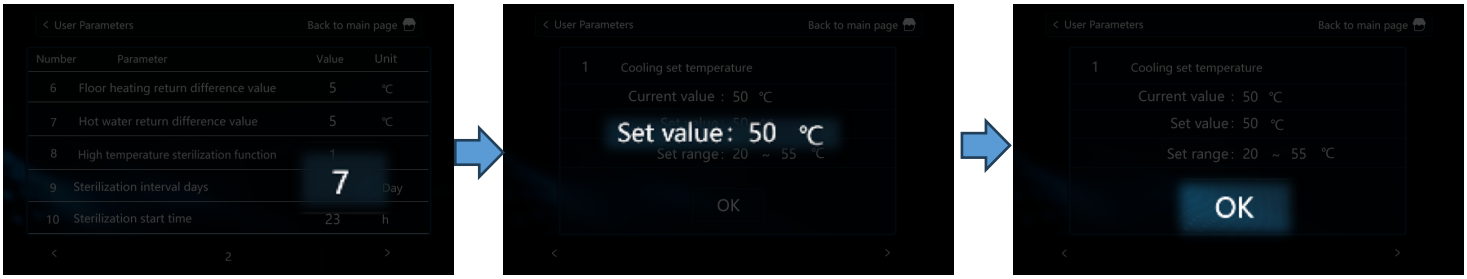
Parameter setting method:

1. Click the value that needs to modify the parameters.

2.Click "Set value: 50 ℃ "

3. Enter the value you need to set and click " ↵ " to confirm.

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

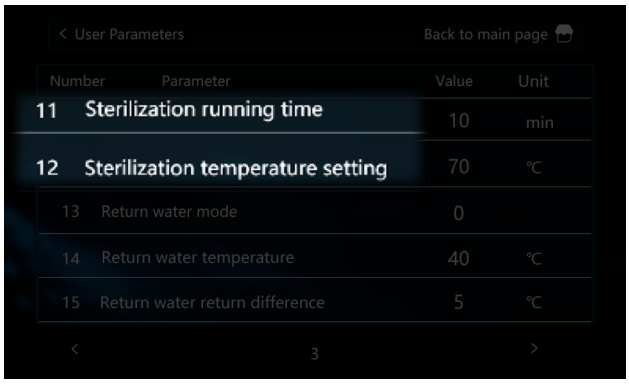


3.2.3.1 Sterilization Setting

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

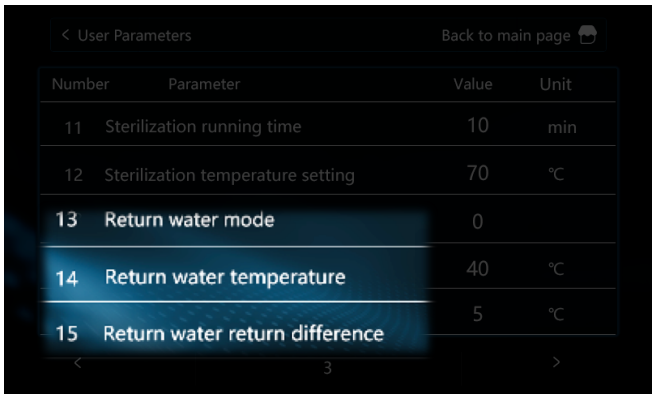
NOTE: Just set the parameters 9-12



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



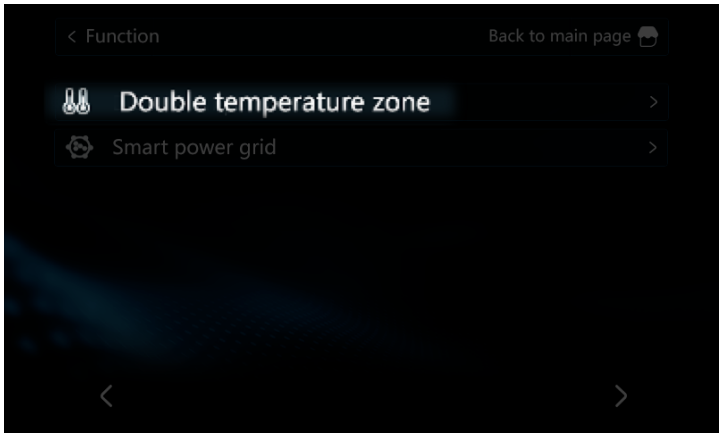
3.2.3.3 Daul Temperature Zone Setting

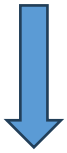
The dual temperature zone control is disable by default, and parameters need to be modified to enable the dual temperature zone control.

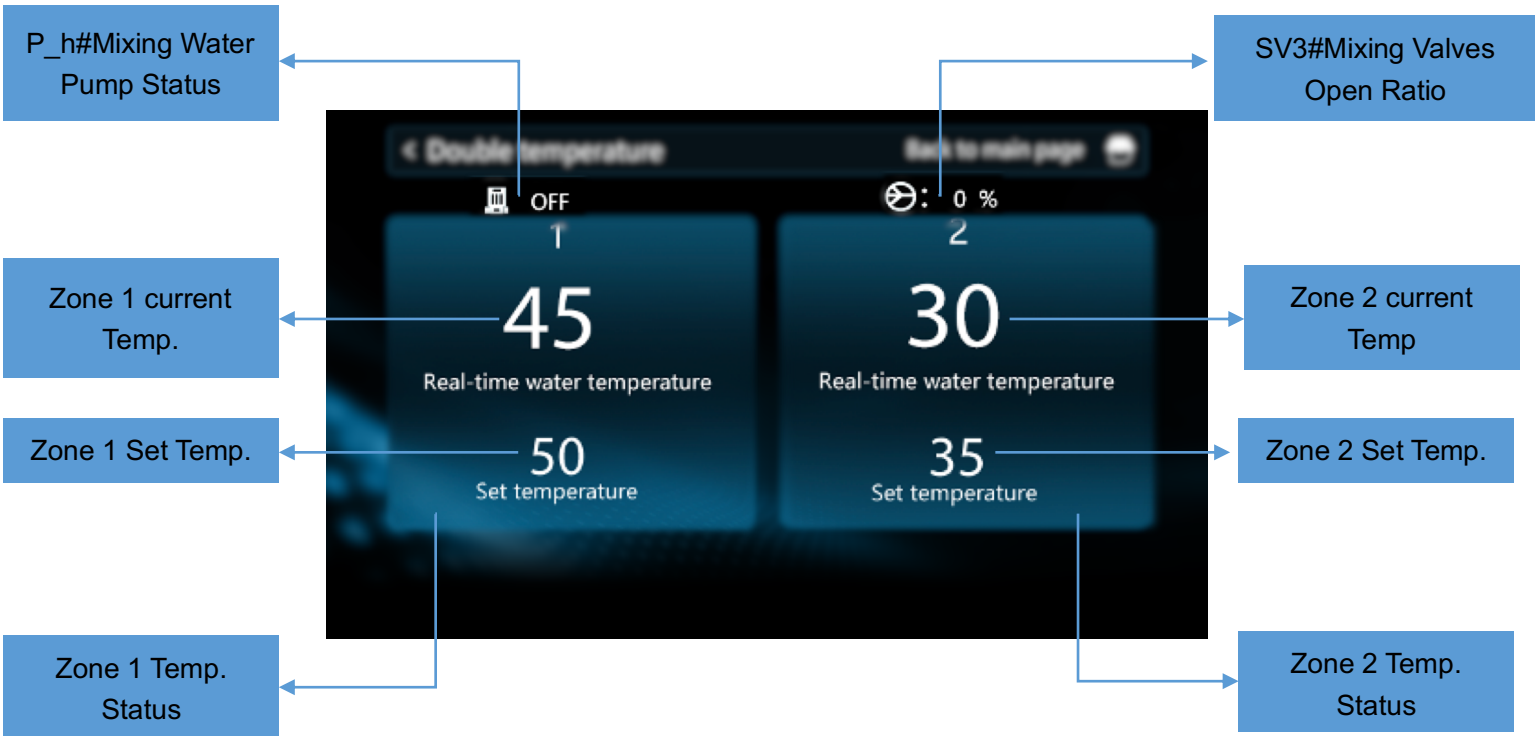
1. Enter the factory parameter page and enter the password "2345".
2. After finding the "P257" parameter, modify the corresponding value to enable the dual temperature zone control. For details, refer to Section 2.7.7

3. After enable dual temperature zone control, click "  " to enter the setting page, click "  " and find "  "

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



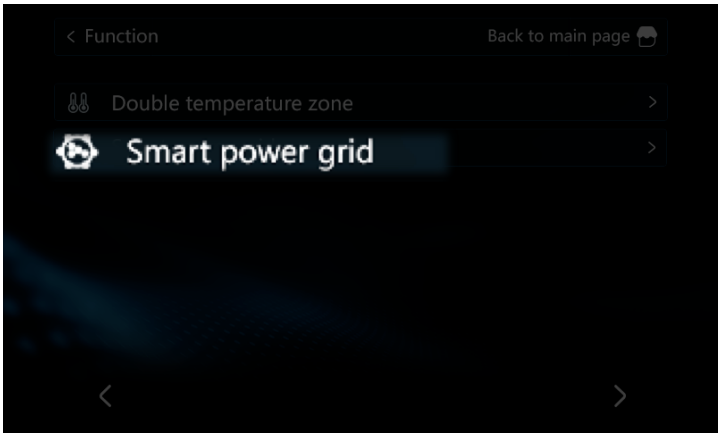


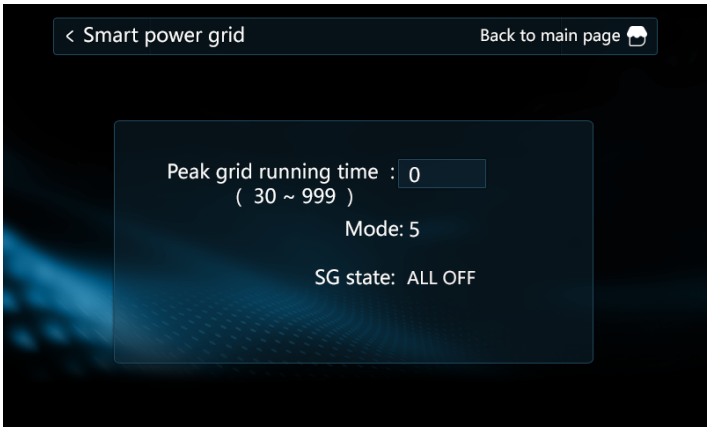


3.2.3.4 SG Ready Setting

The SG Ready function is disable 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 disable by default. If need to enable, it needs to modify parameters to enable the cascade control.

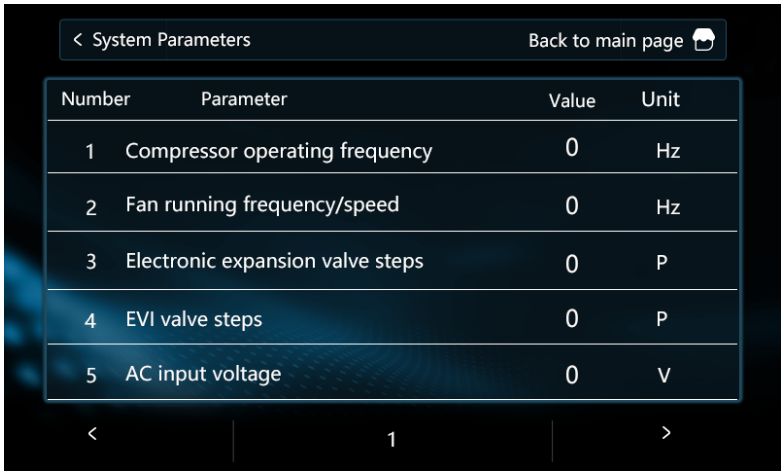
1. Enter the factory parameter page and enter the password "2345".
2. After finding the "P164" parameter, modify the corresponding value to enable the cascade. For details, refer to Section 2.7.7

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.

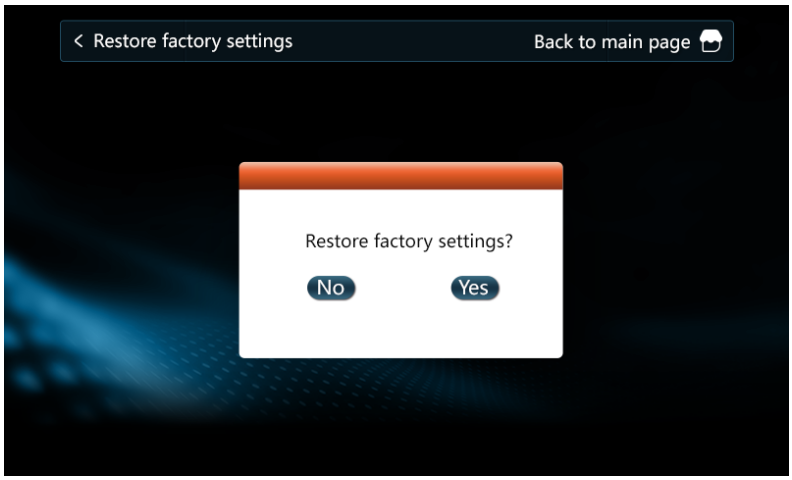


Running status query method in cascade mode:

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

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.



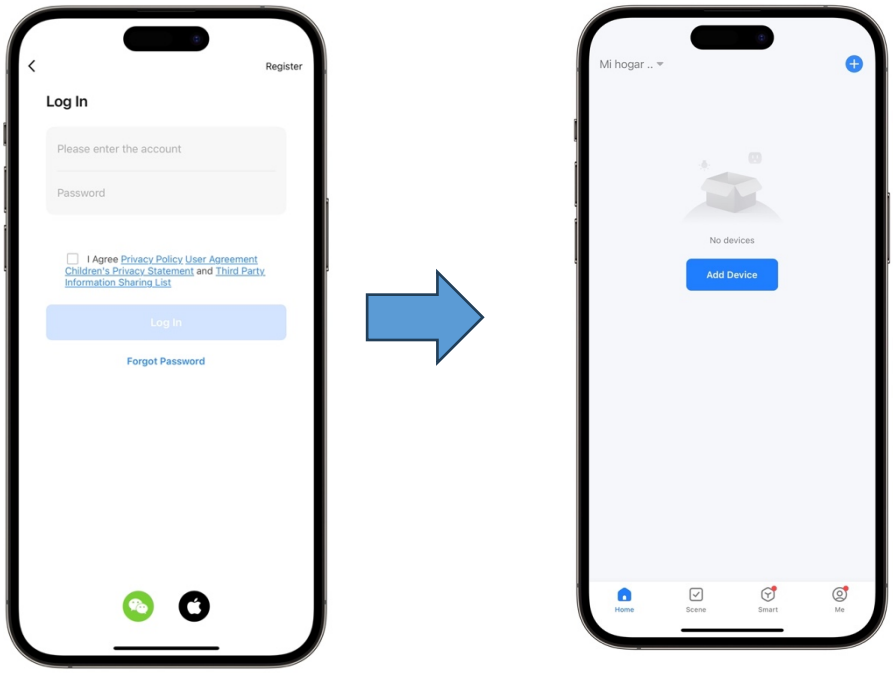
3.2.6 APP & Unit Binding

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.

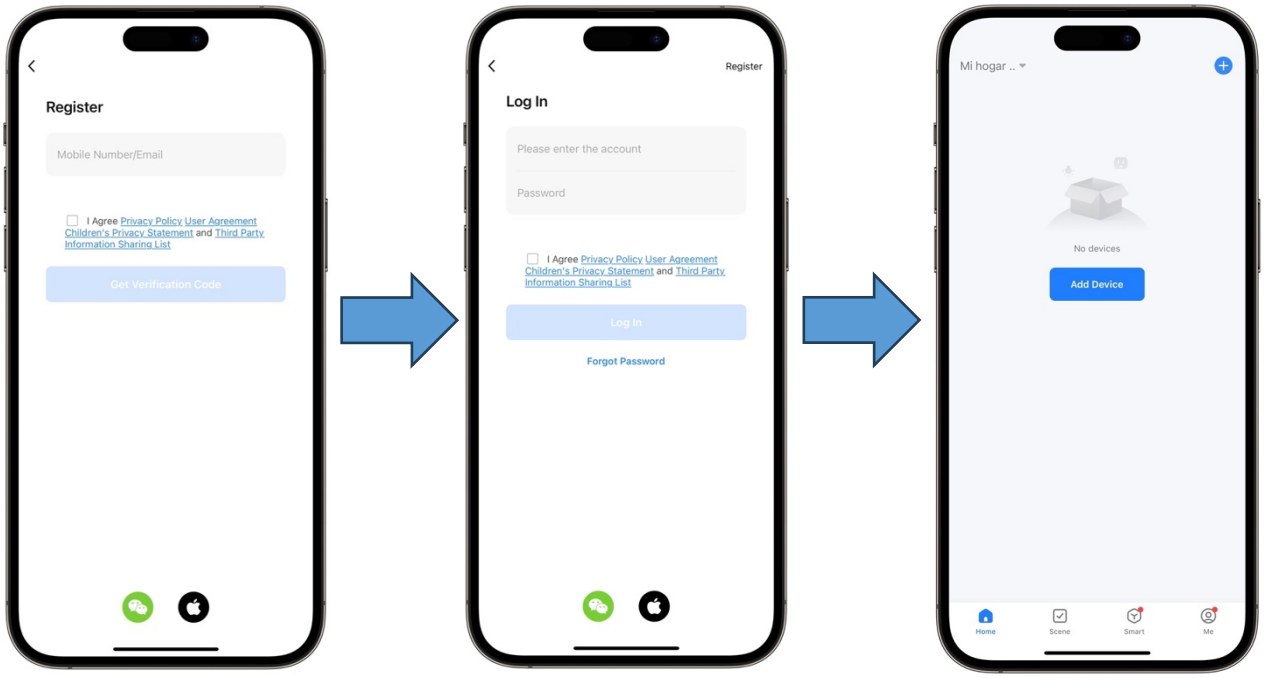
For more APP operations, please refer to "Operation Manual."

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.



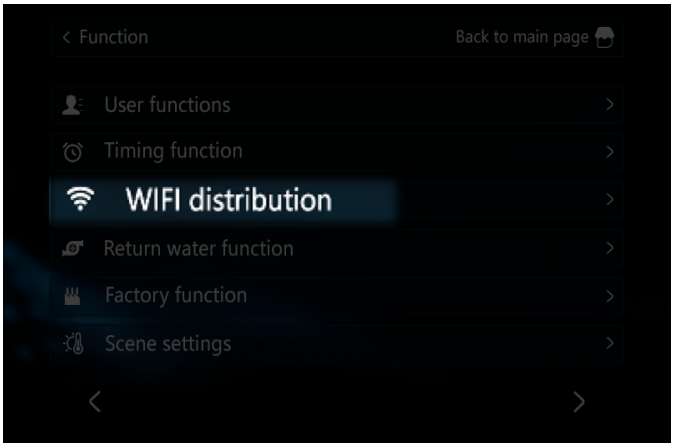
3.2.6.1 Networking (Smart Mode)

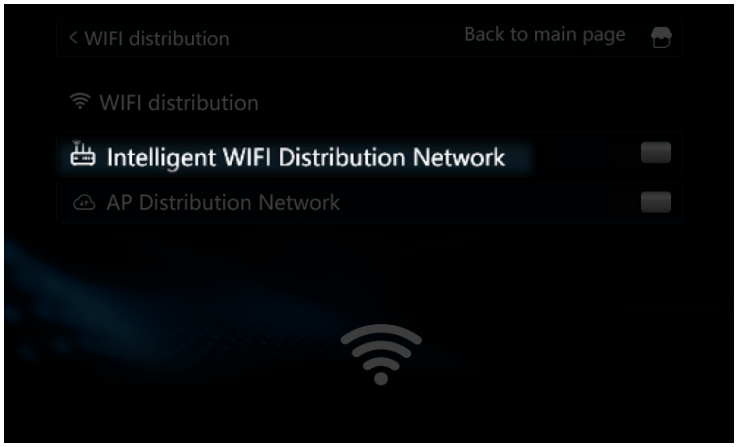
Generally, it is recommended to use smart mode. The wire controller is required to be within WIFI coverage.
The wire controller must first enter the network distribution mode.
The following is the operation method:

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.



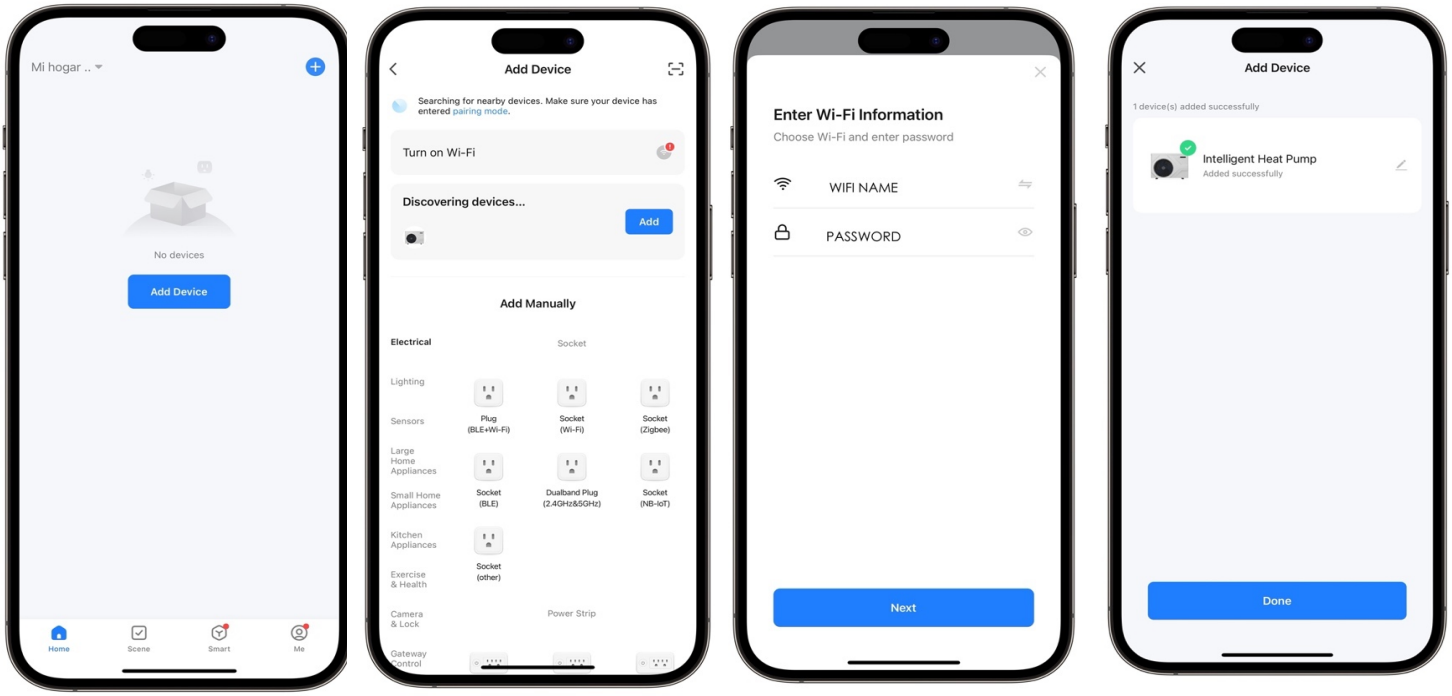


After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.

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

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

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.

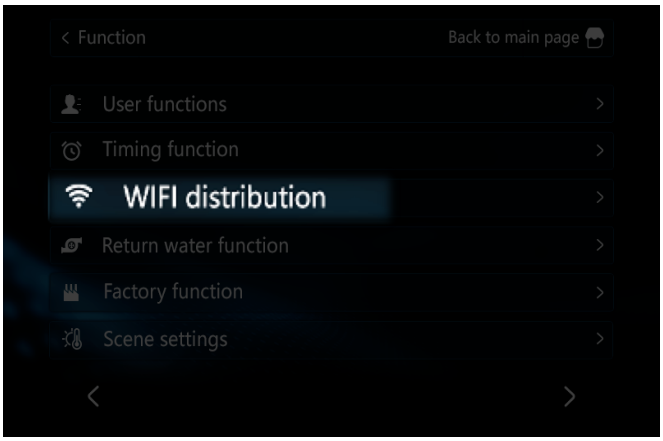
The following is the operation method:

1. Click "  " on the wired controller to enter the function setting page.

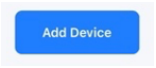
2. Click "  " to enter the WIFI distribution mode selection page.

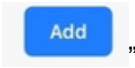
3. Click "  " to enter AP network mode.

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

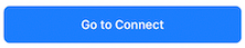


After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.

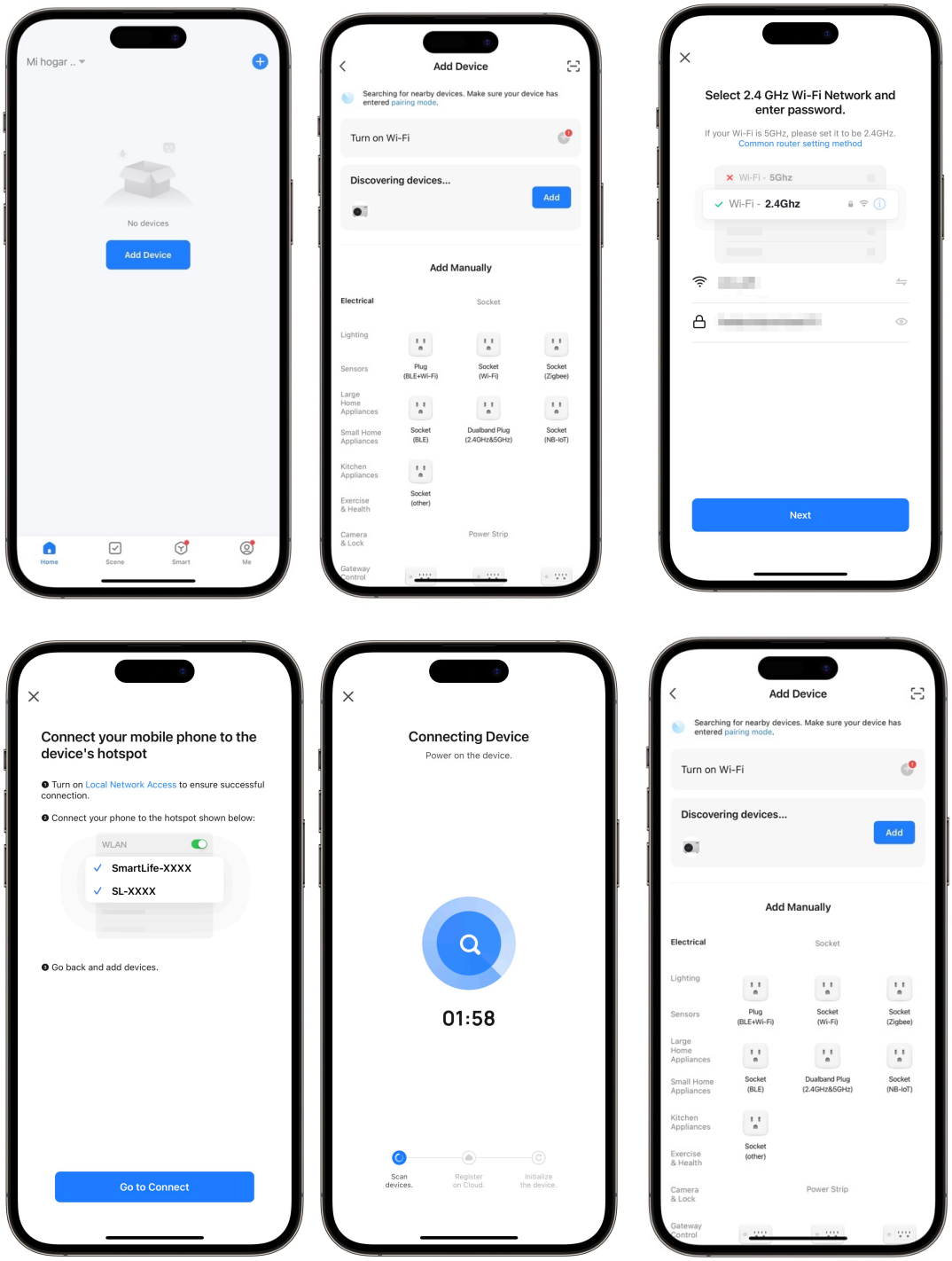
1.Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click "  ".

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


Mi hogar ..
No devices
Add Device
Home
Scene
Smart
Me
Add Device
Searching for nearby devices. Make sure your device has entered pairing mode.
Turn on Wi-Fi
Discovering devices...
Add
Add Manually
Electrical
Socket
Lighting
Sensors
Large Home Appliances
Small Home Appliances
Kitchen Appliances
Exercise & Health
Camera & Lock
Gateway Control
Plug (BLE+Wi-Fi)
Socket (Wi-Fi)
Socket (Zigbee)
Socket (BLE)
Dualband Plug (2.4GHz&5GHz)
Socket (NB-IoT)
Socket (other)
Power Strip
Select 2.4 GHz Wi-Fi Network and enter password.
If your Wi-Fi is 5GHz, please set it to be 2.4GHz.
Common router setting method
Wi-Fi - 5Ghz
Wi-Fi - 2.4Ghz
Next
Connect your mobile phone to the device's hotspot
Turn on Local Network Access to ensure successful connection.
Connect your phone to the hotspot shown below:
WLAN
SmartLife-XXXX
SL-XXXX
Go back and add devices.
Go to Connect
Connecting Device
Power on the device.
01:58
Scan devices.
Register on Cloud.
Initialize the device.
Add Device
Searching for nearby devices. Make sure your device has entered pairing mode.
Turn on Wi-Fi
Discovering devices...
Add
Add Manually
Electrical
Socket
Lighting
Sensors
Large Home Appliances
Small Home Appliances
Kitchen Appliances
Exercise & Health
Camera & Lock
Gateway Control
Plug (BLE+Wi-Fi)
Socket (Wi-Fi)
Socket (Zigbee)
Socket (BLE)
Dualband Plug (2.4GHz&5GHz)
Socket (NB-IoT)
Socket (other)
Power Strip

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".

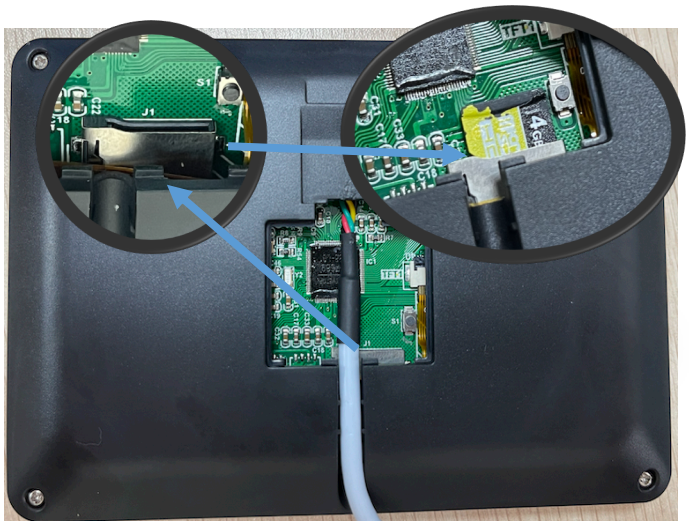
2. Copy the file names "MCU_Code " and " UartTFT_Flash " to the SD card.

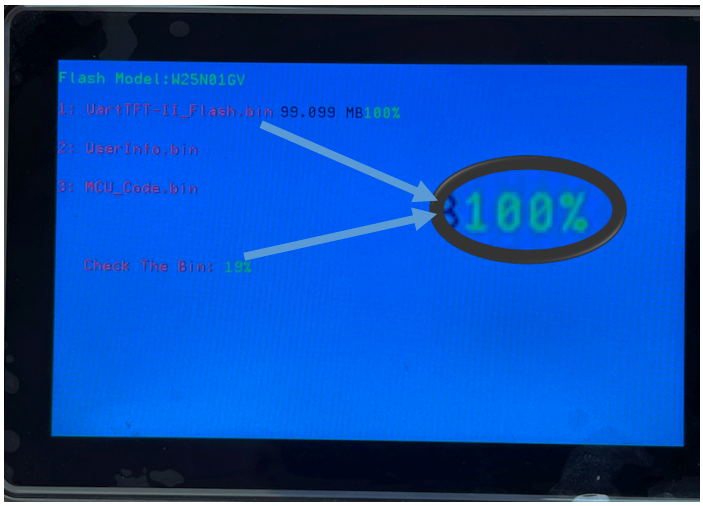
3. Disconnect the wire controller, open the back cover, find the SD card slot, and insert the memory card.

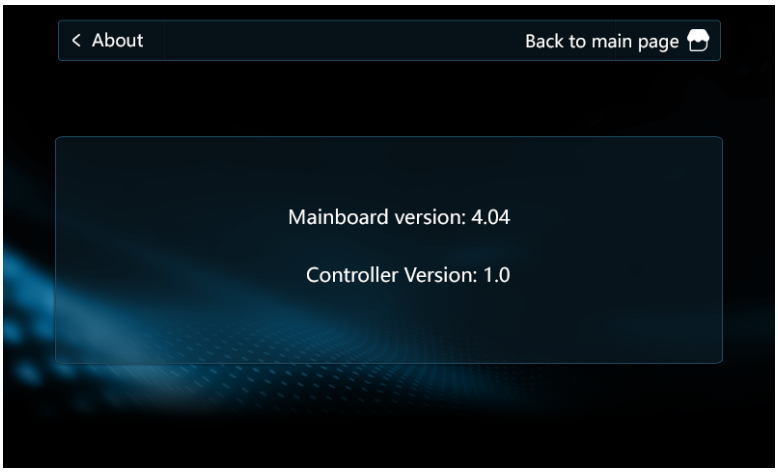
4. Re-power on the wire controller, the wire controller automatically enters the upgrade program.

5. When both "1: UartTFT-II_Flash.bin " 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

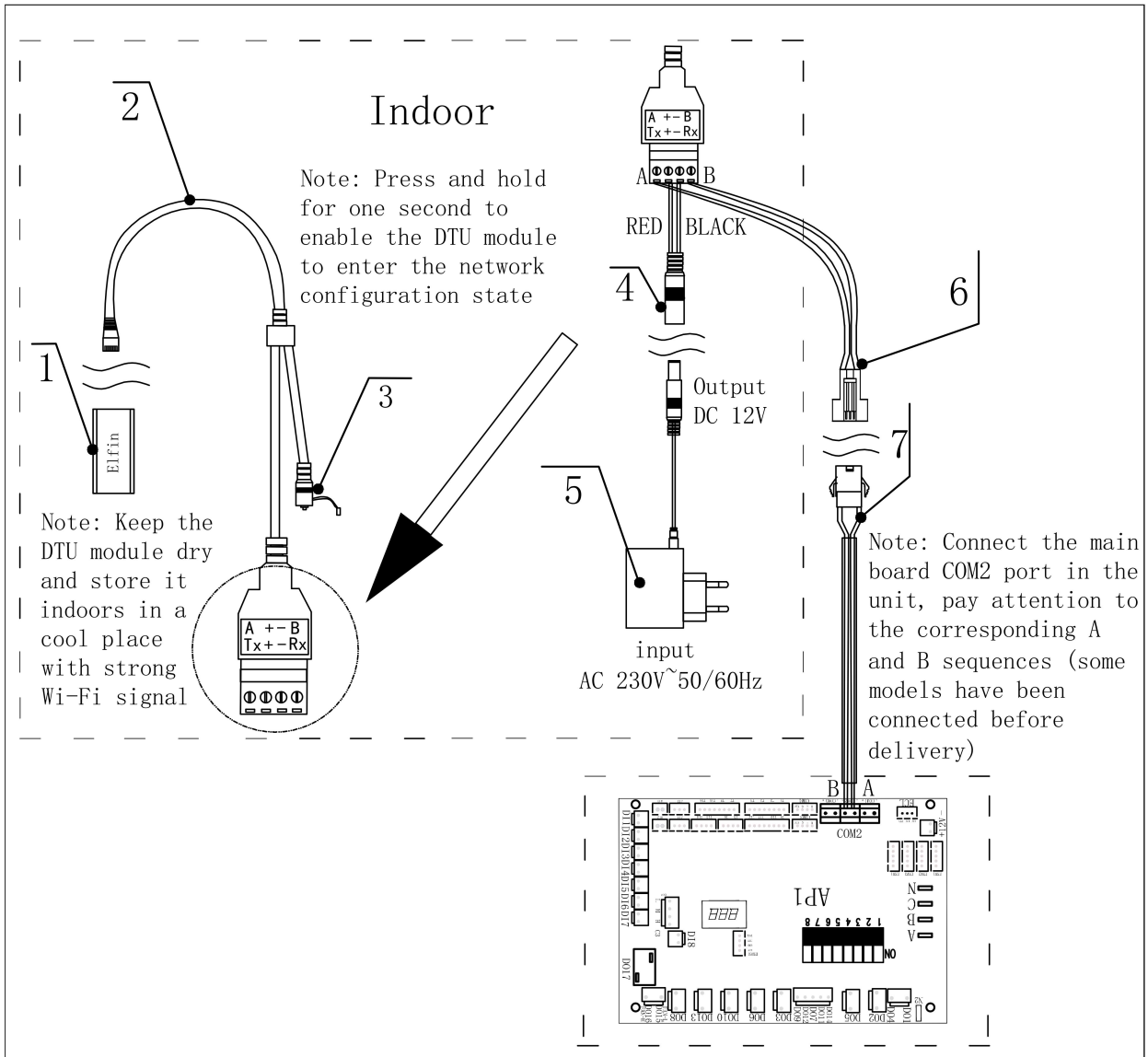
To be improved.

3.3.3 OTA

To be improved.

3.4 IoT Platform

3.4.1 DTU Module Connection



Number	Name	Specifications/Models	Count	Note
7	SM-2P	22AWG*2 105℃ 500mm	1	Some models come with factory
6	SM-2R	22AWG*2 105℃ 8000mm	1	
5	YE-EW11A-P012V	AC 230V~50/60Hz → DC 12V	1	Keep dry and in the shade indoors
4	YX-EW11A-FDC2		1	Keep dry and in the shade indoors
3	Key Switch		1	Restore factory Settings and Smart-Link distribution network
2	YX-EW11A-L4pin		1	Keep dry and in the shade indoors
1	Elfin	RS485←→Wi-Fi	1	Keep dry and in the shade indoors

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

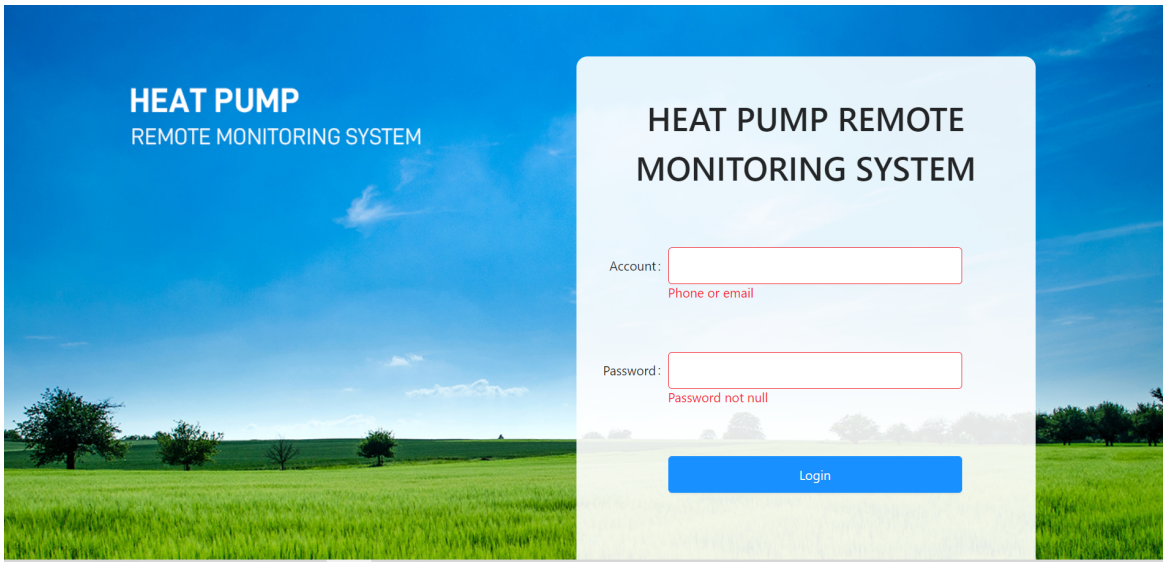
- Account management: manage accounts other than dealers in the system, create required roles, and assign roles to accounts.
- Role management: manage the roles in the system, specify the access rights and operation rights of various functions in the system for the roles.
- APP management: manage the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

3.4.3 Login System

3.4.3.1 User Login

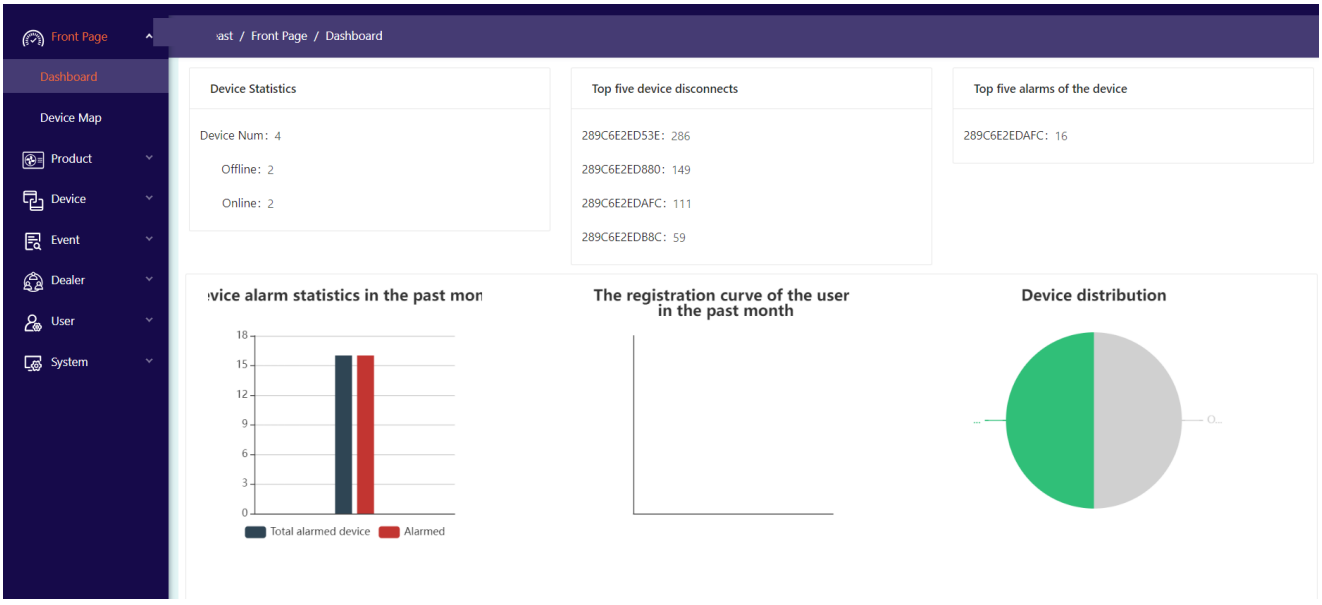
Enter https://saas.mysmartiot.com/ in the address bar of the browser, and the login page will be displayed by default after the web page opens, as shown in the figure below:

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.

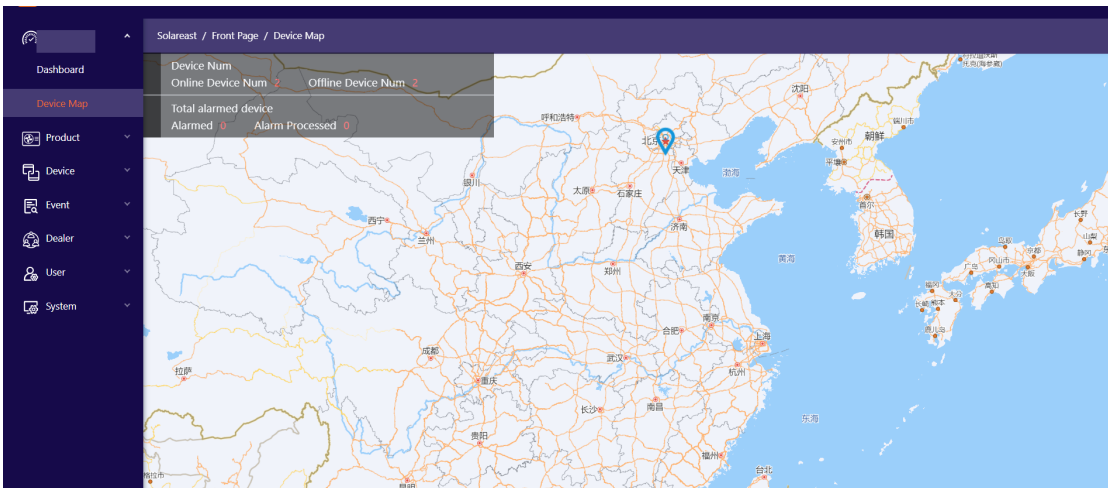
3.Count the top five devices with the number of alarms and display the number of alarms.

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:r

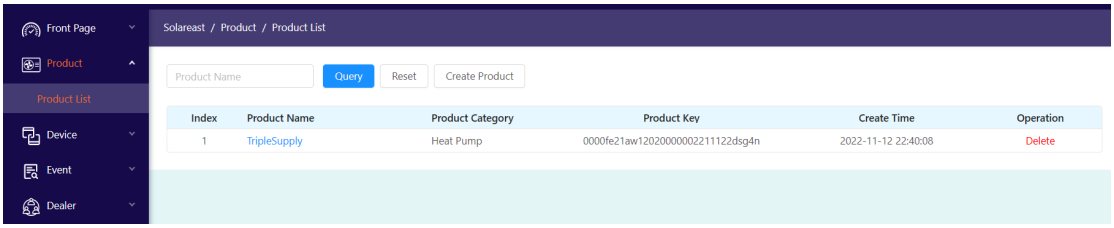


Click the device logo in the map to pop up the relevant information of the device, as shown in the figure above.

3.4.4 Products

3.4.4.1 Product List

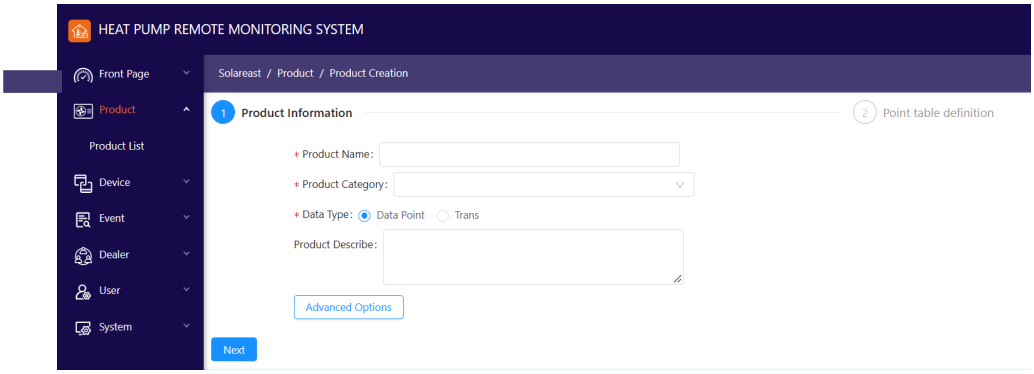
Types created in the current system in the form of a list. Products can be deleted.



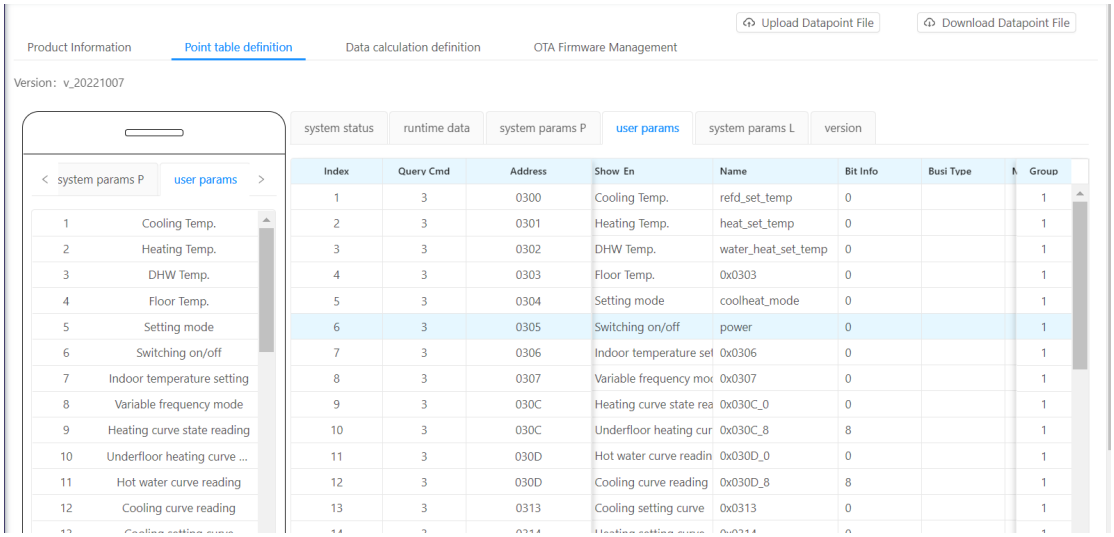
3.4.4.2 Create and Edit

1.Create Product

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



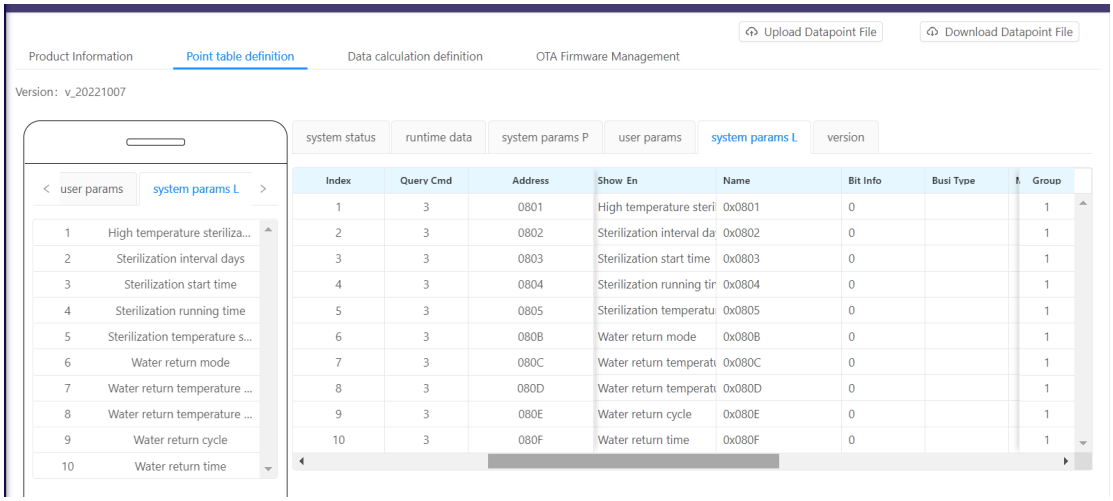
After filling in the required basic information, if the data type selects "Transparent Transmission", click Save to complete the product creation; if the data type selects "Point Table", click Next to edit the point table:



After clicking Finish, the product is successfully created.

2.Product Editing

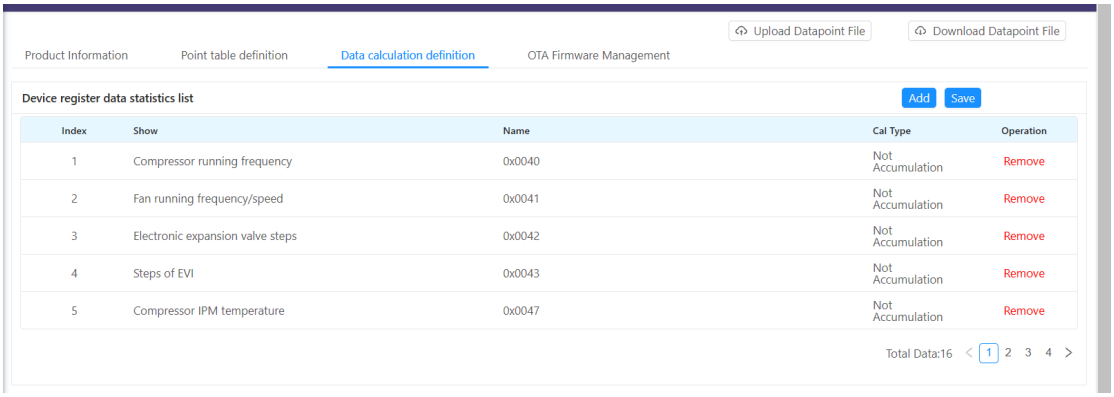
On the product list page, click an existing product name to enter the product editing page, as shown below:



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:

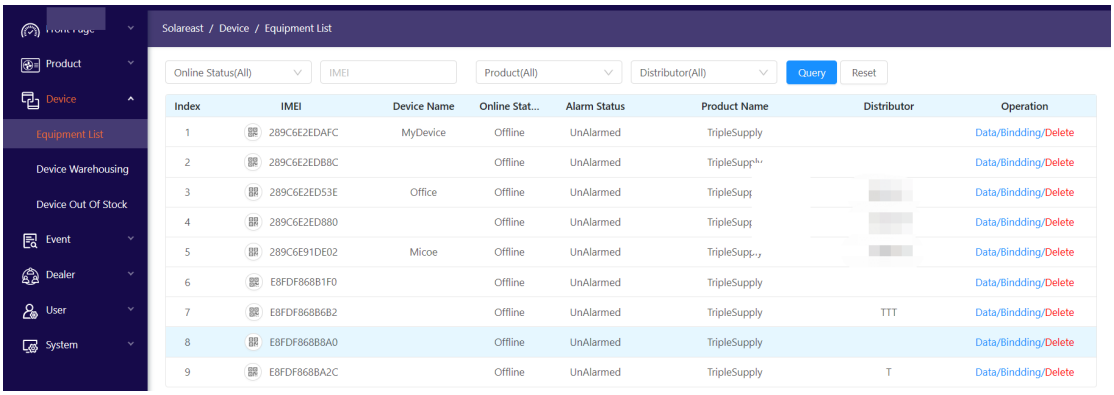


User-selected data can be viewed in the device analytics for individual devices.

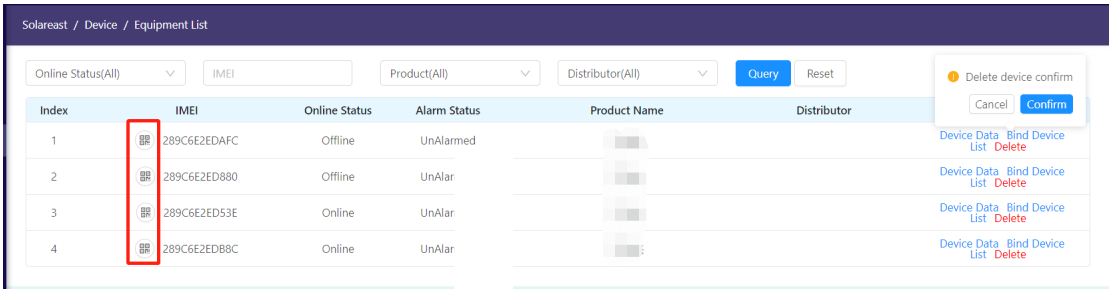
3.4.5 Equipment

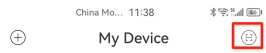
3.4.5.1 Equipment List

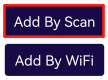
Click Device List in the menu to open the Device List page, displaying all devices in the current system:

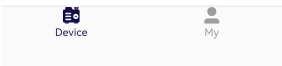


Users can query based on device online status, IMEI, product and dealer, and perform related functions on a single device.







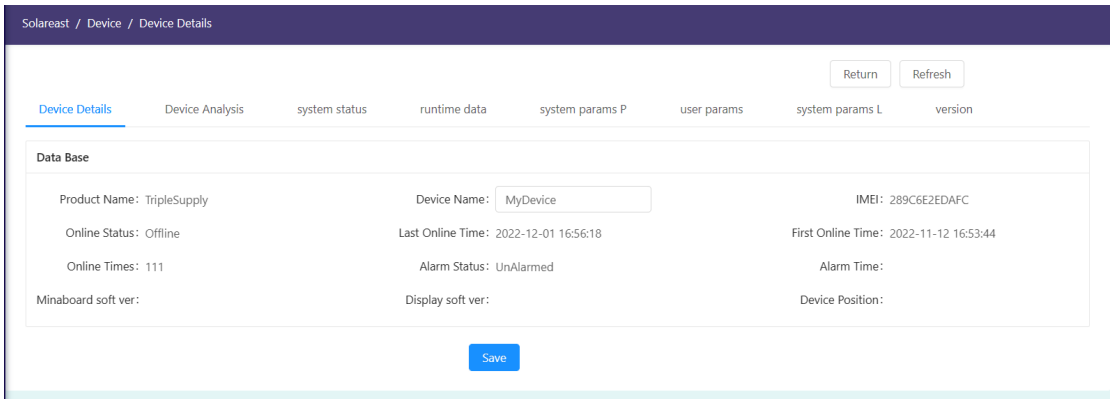


mac:289C6E91DE02

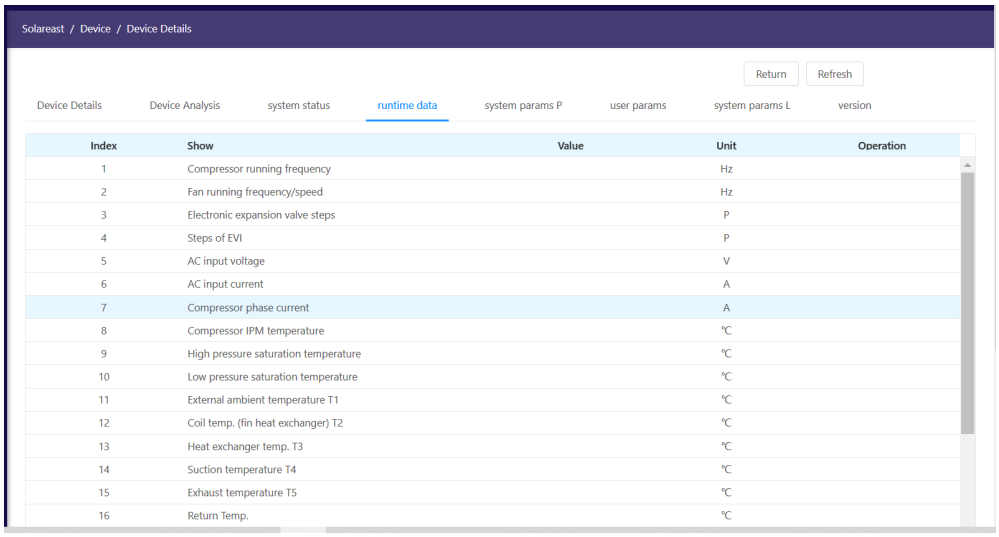
Click the QR code icon at the IMEI to display the shared QR code of the device and use the mobile APP to scan the code to add this user device and realize the binding.

a) Device Data

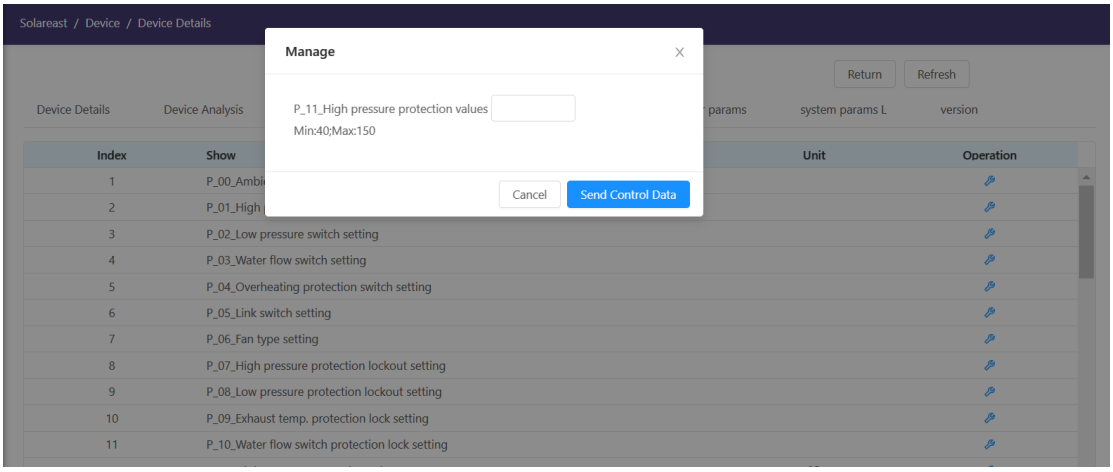
Click "Device Data" to see the detailed information of this device, as shown in the figure below:



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

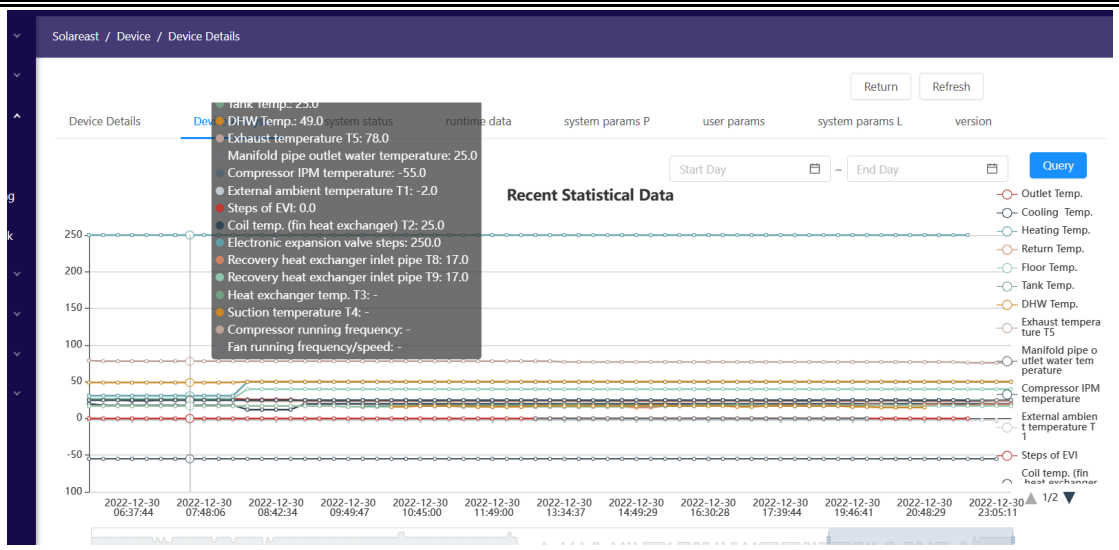


For parameters that can be remotely maintained and modified, new parameters can be set and sent to the device:



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

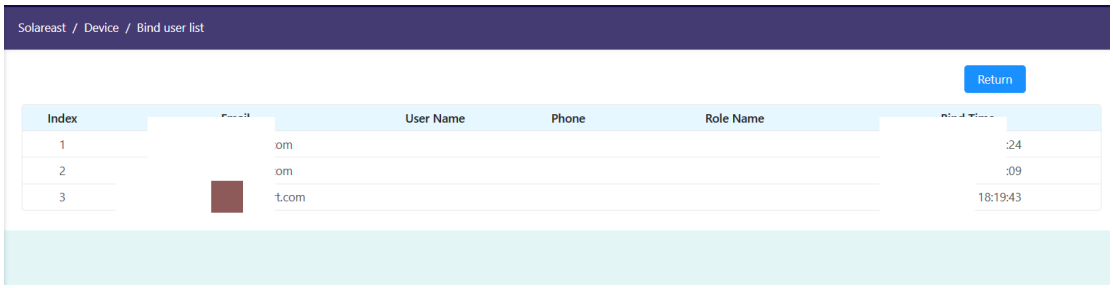
The Equipment Analysis page is used to plot the data points selected by the user in the product definition:



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.

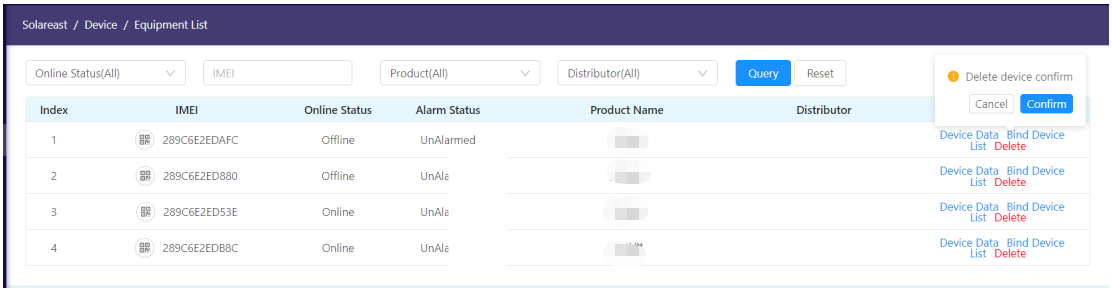
b) Bind user list.

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.



c) delete device

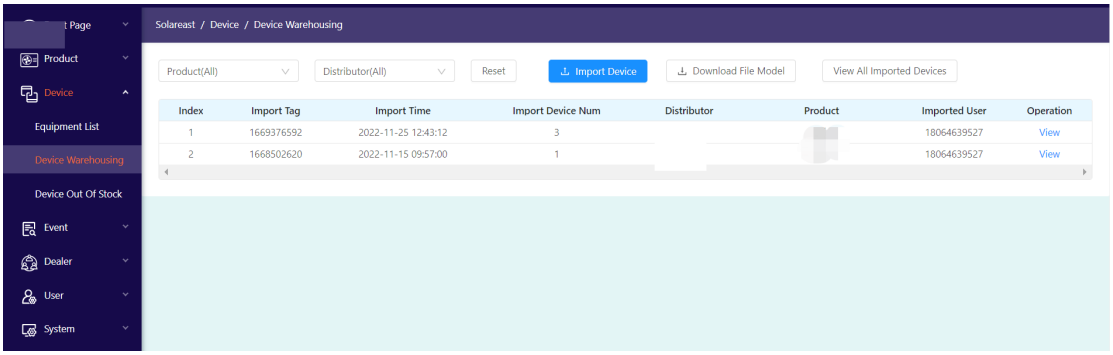
Click "Delete" in the device list to delete the current device, as follows:



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.

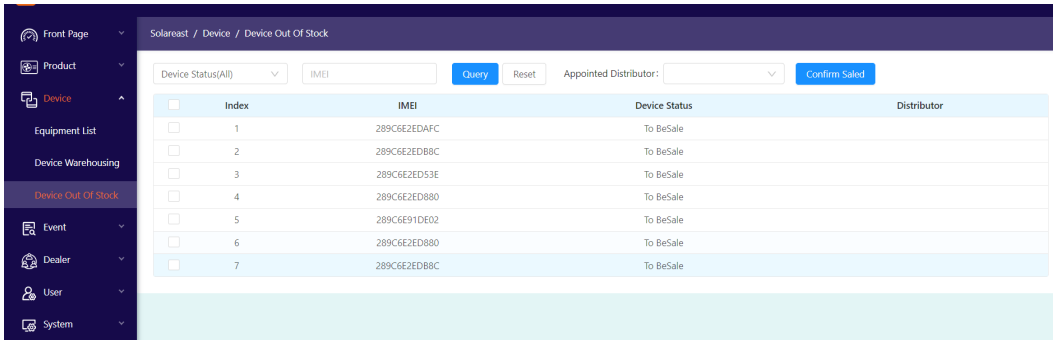
By clicking "Download Import Template", you can download the excel template used to import the device. The imported device template is as follows:

	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.

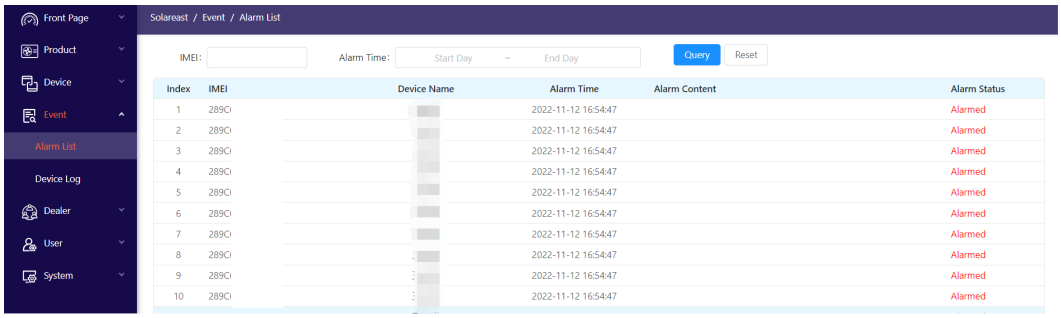
After selecting the designated dealer, check the equipment to release the warehouse. After the warehouse is released, the dealer account logs in to the system, and you can see the equipment shipped to your own account in the equipment list.



3.4.6 Events

3.4.6.1 Alarm List

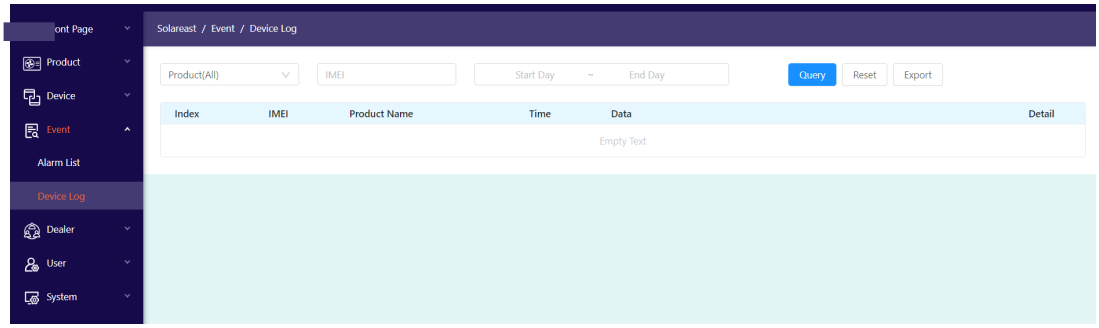
Display the alarm records of the device in the form of a list, as shown in the figure below:



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:



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

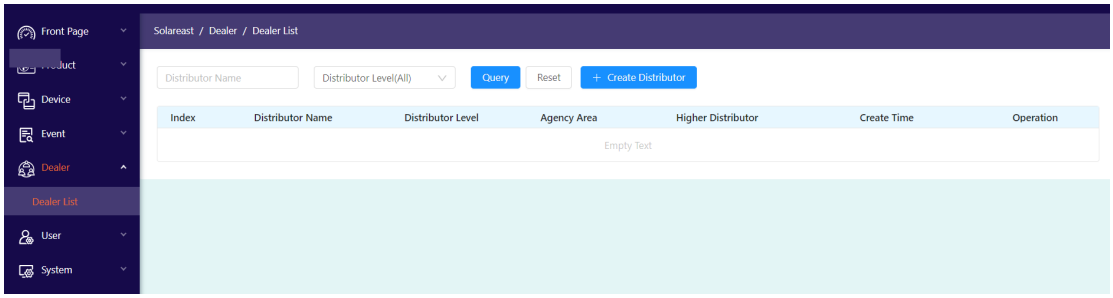
Click "View" to display the parsed content of the current line of binary data.

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

3.4.7 Dealer Management

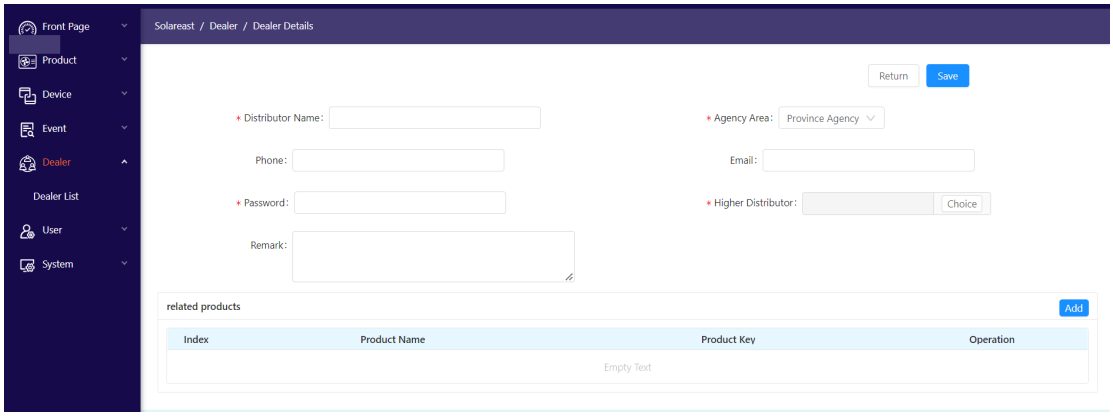
3.4.7.1 Dealer List

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.



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:



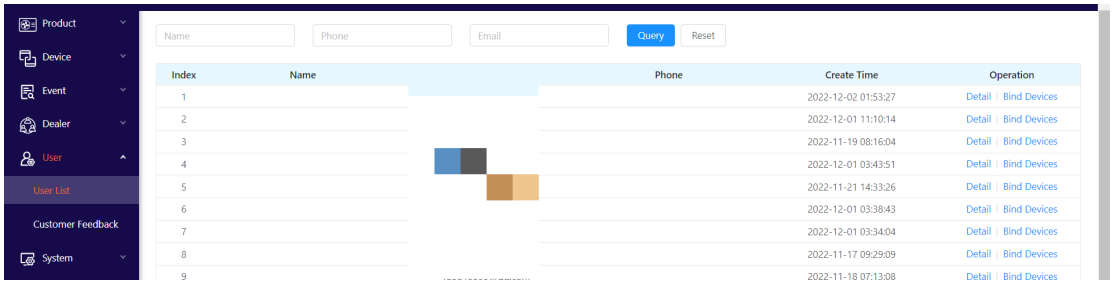
A parent distributor and associated products can be designated for this distributor.

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:



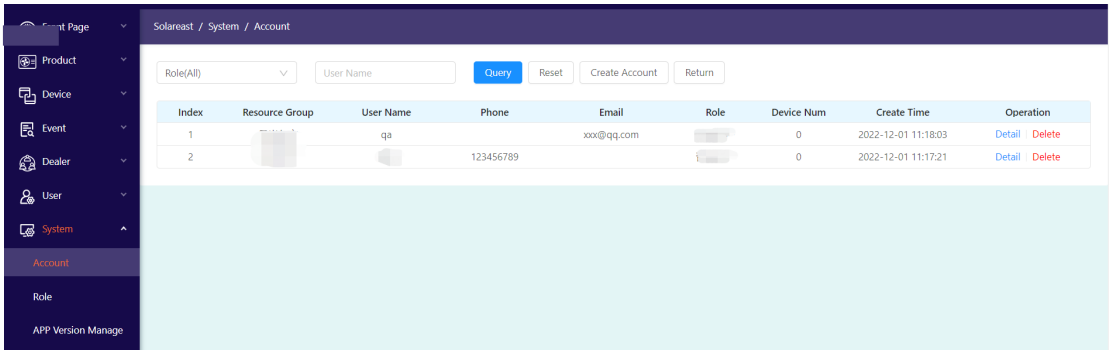
It can be filtered according to the mobile phone number and username, and the list of devices bound to the user can be viewed.

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.

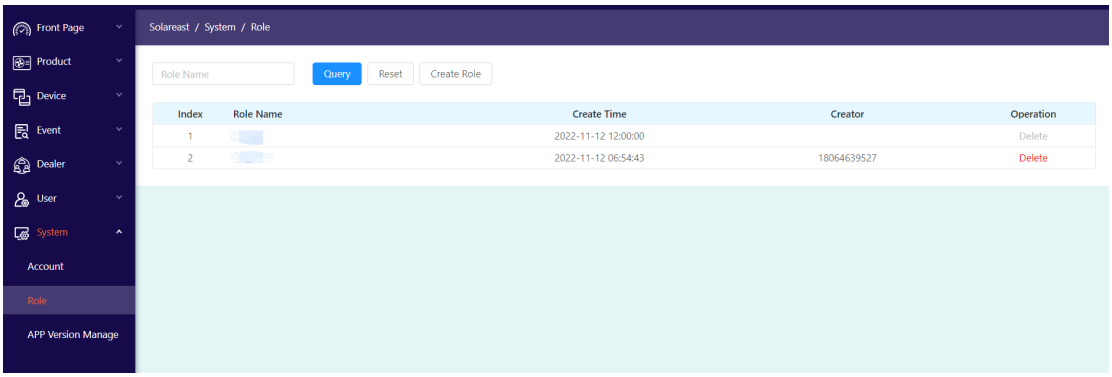
Click "Create Account" to open the account page to create a new user account.

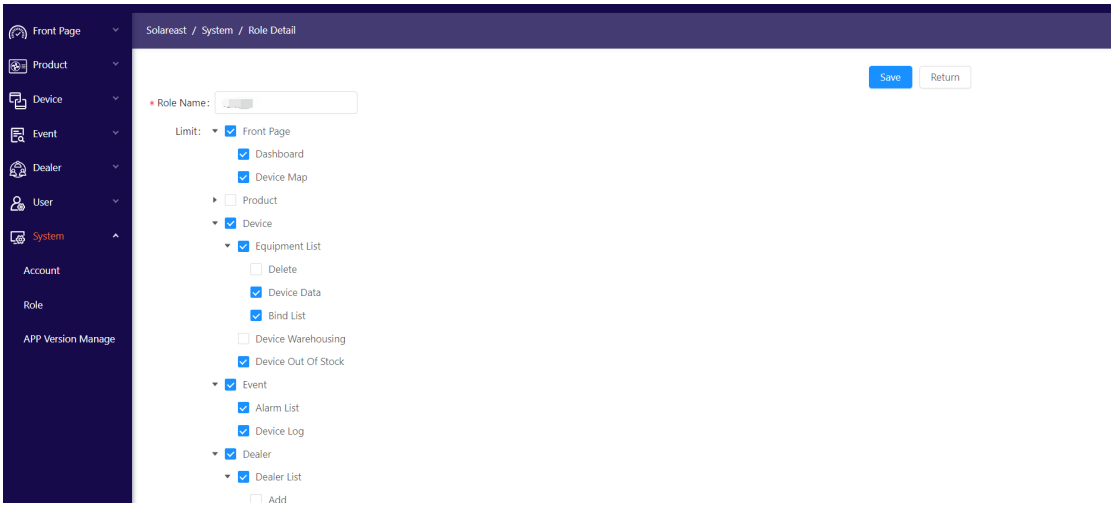
Click "Details" in the account list to open the account details page, edit and save the account information.

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.

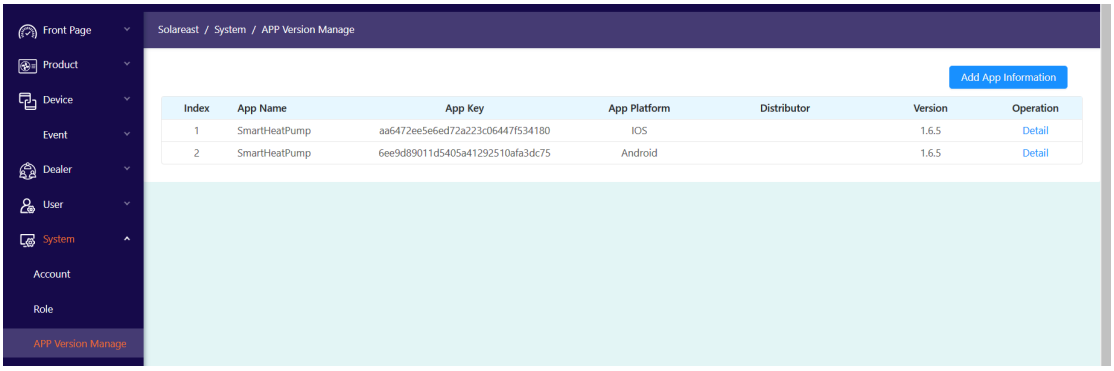




Checking the box means assigning permissions to this role. A role is assigned to an account when the account is created.

3.4.9.3 APP Management

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



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

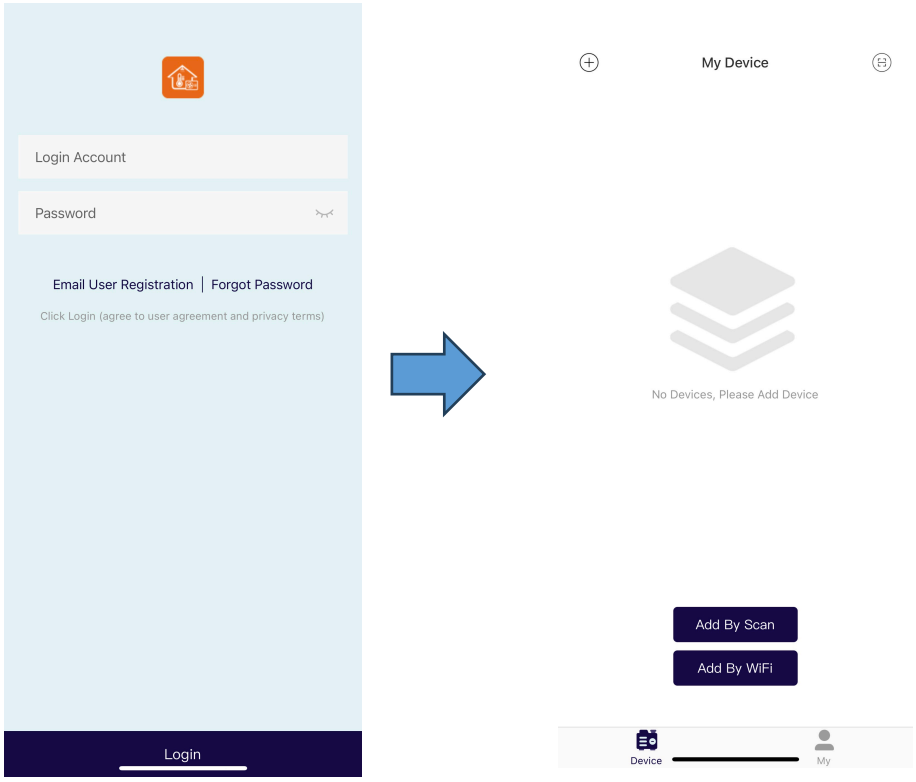
Search for "Smart Heat-Pump" in the app store or scan the QR code below to download the app.

For IOS

For Android OS

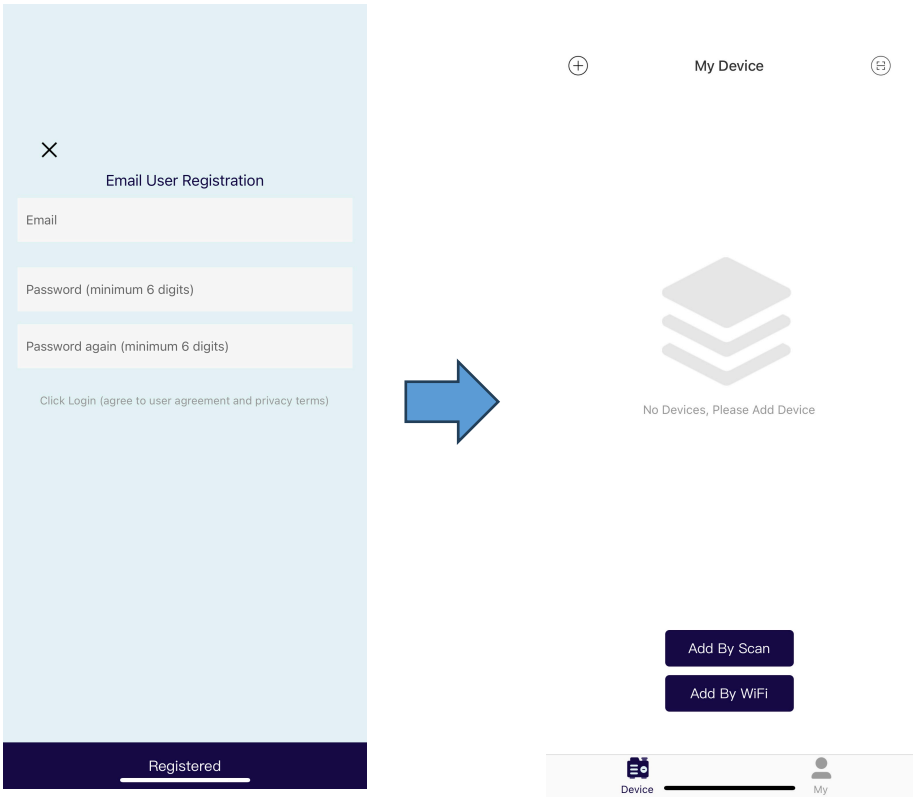
Login & Register Steps:

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.

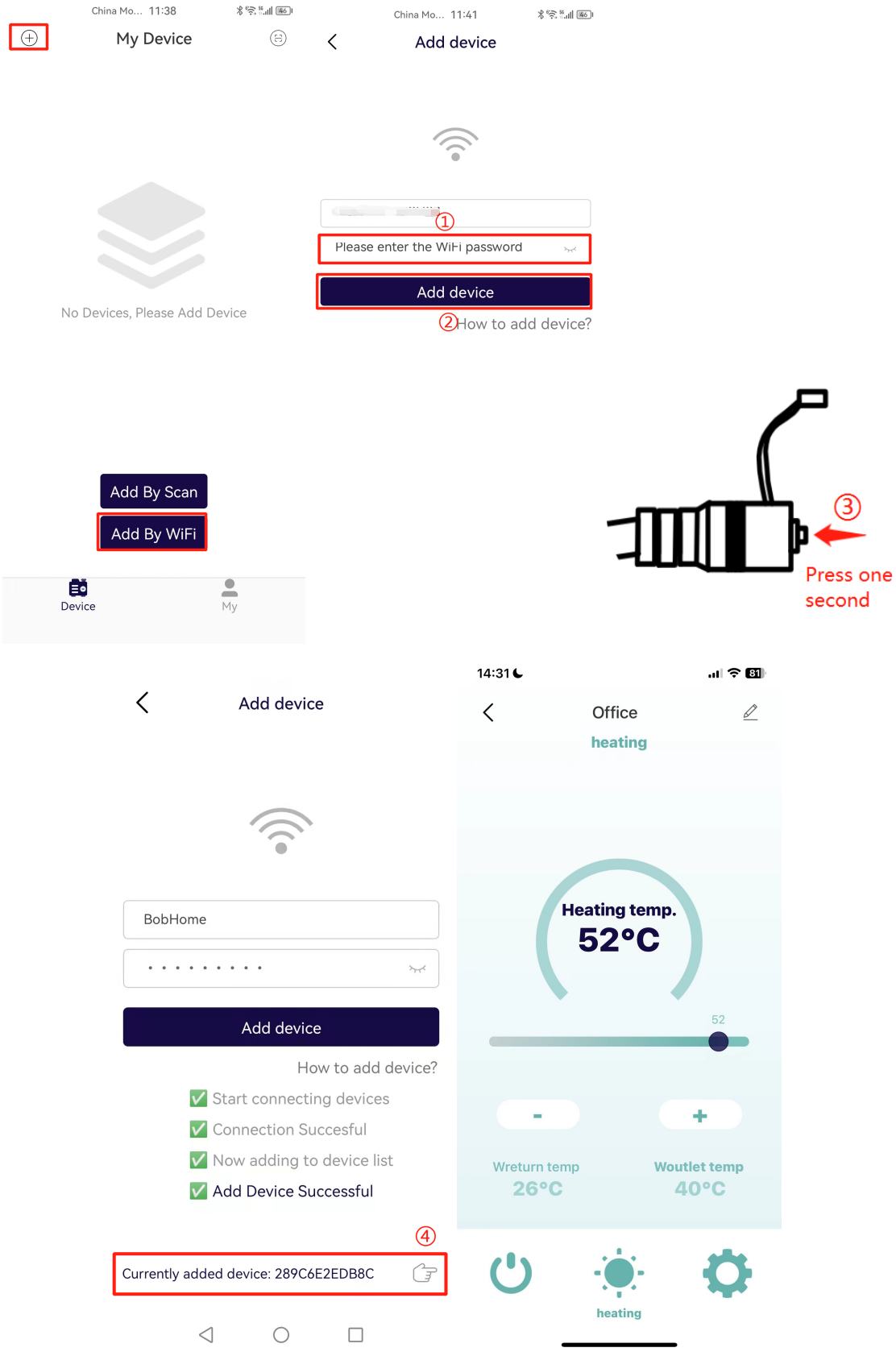
Binding via WIFI:

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

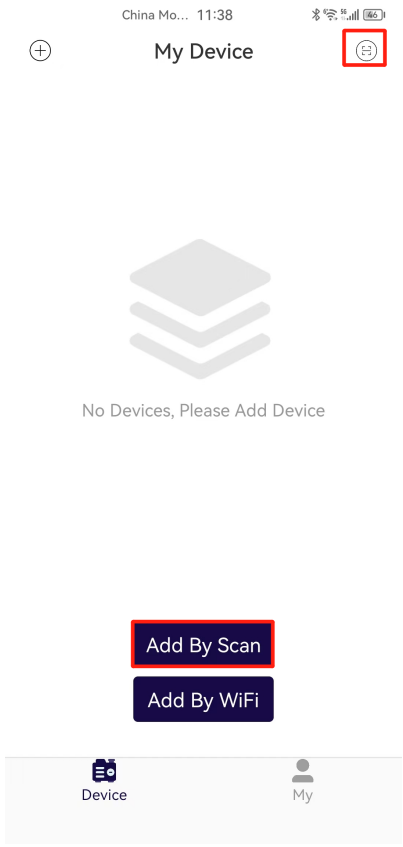


Bind the device by scanning the code:

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.

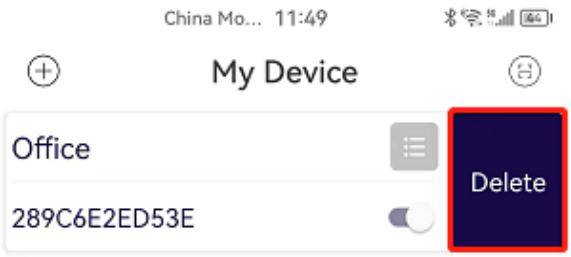
2.this scan box with the QR code of the shared device to complete the scan code to add the device.

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

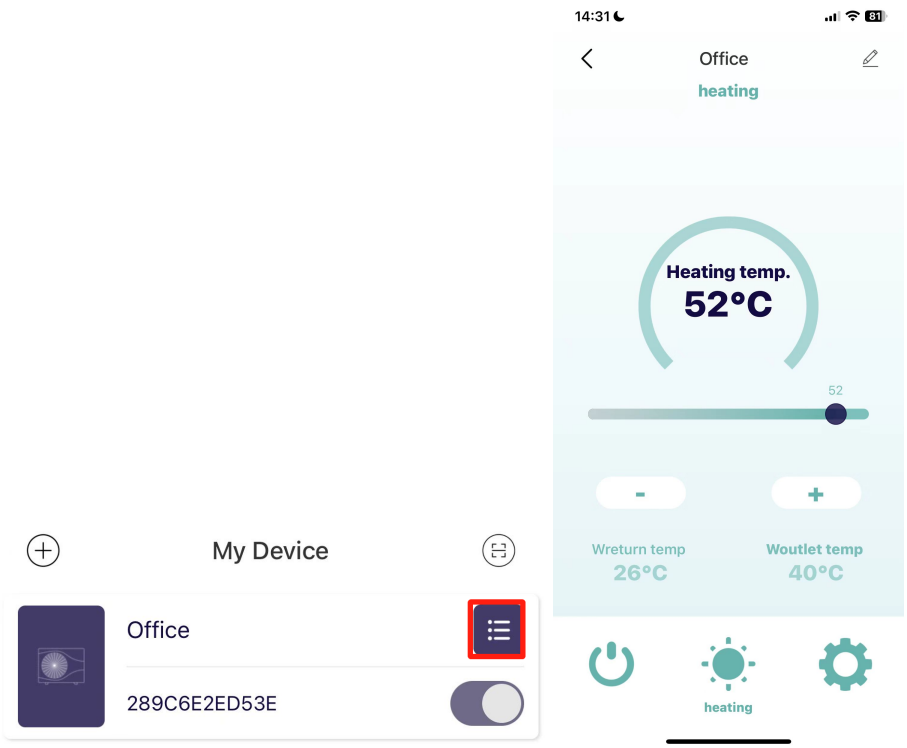


3.4.10.3 Device List

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:

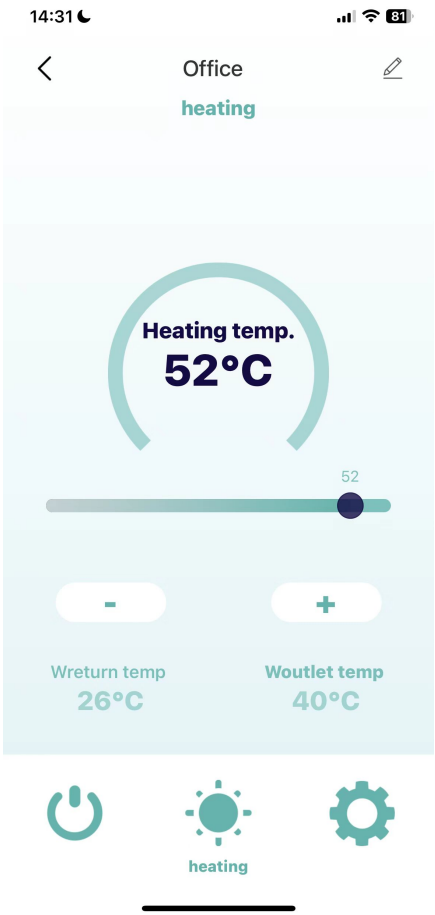


Click the icon in the upper right corner in the figure below to enter the control page of the device.



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.

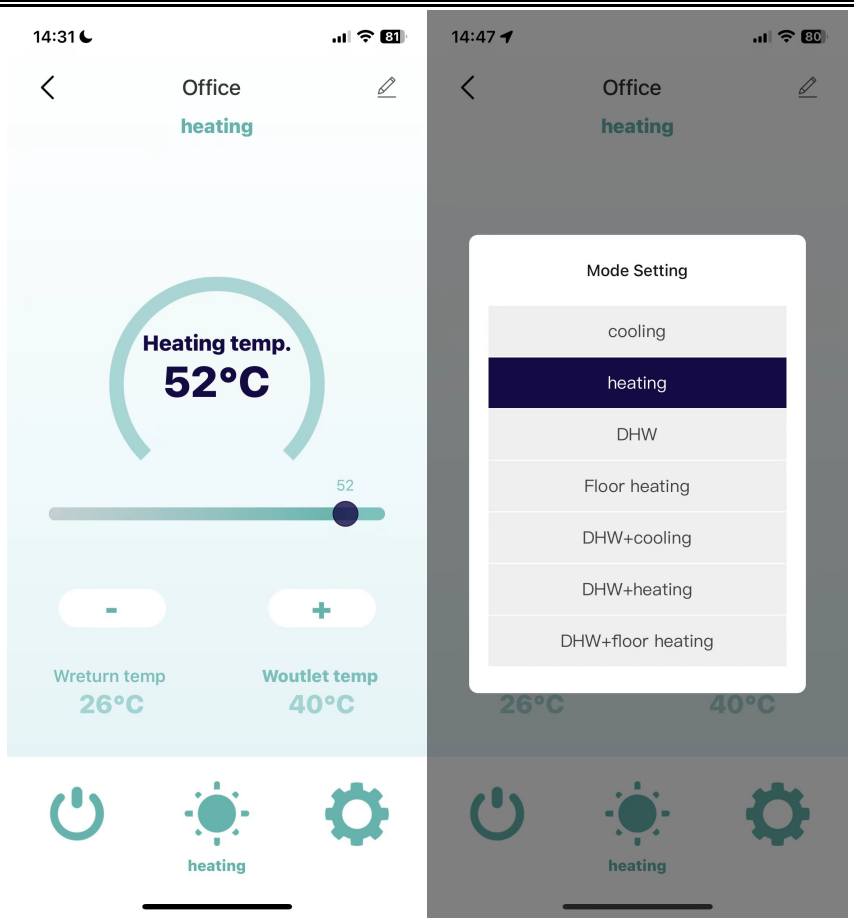
4.The page also displays two items of return water temperature, outlet water temperature or water tank temperature according to different working modes.

5.The bottom three buttons, from left to right are: device switch, working mode, setting parameters.

5.1Click 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.

5.2Click the working mode to see the mode selection menu, and you can modify the working mode of the device.

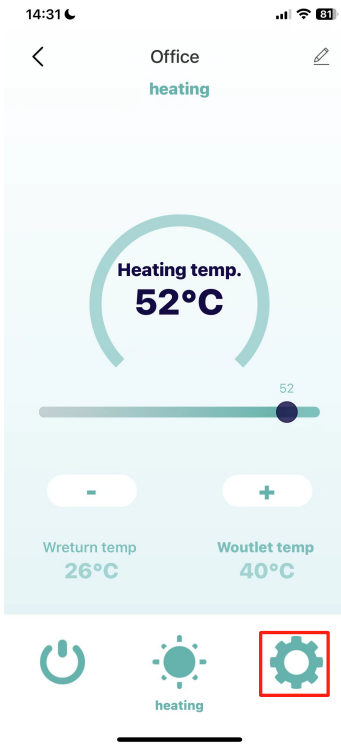
5.3Click the parameter setting button to view and set the detailed parameter information of the device.



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.

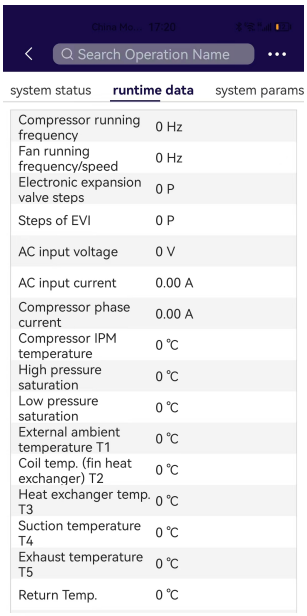
3.4.10.5 Parameter Query

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



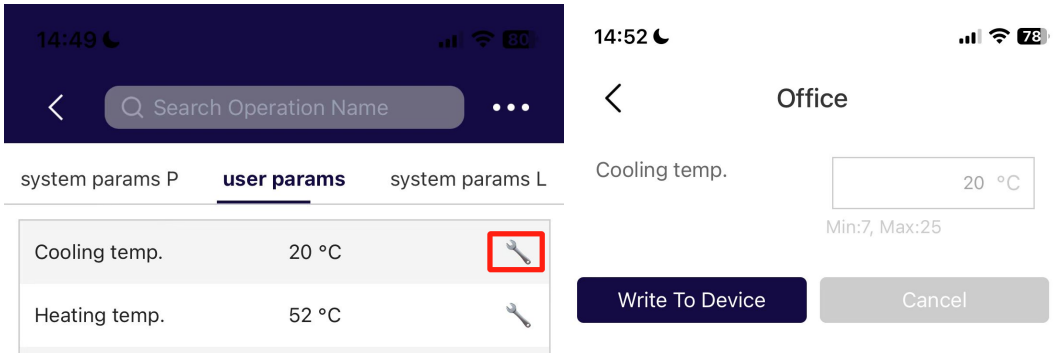
2.Device parameters are divided into the following label categories:

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

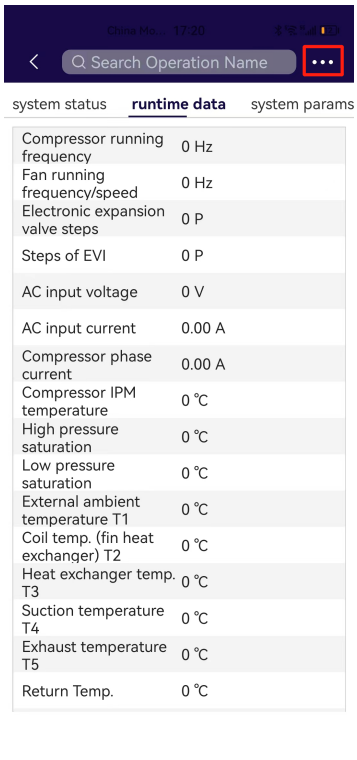


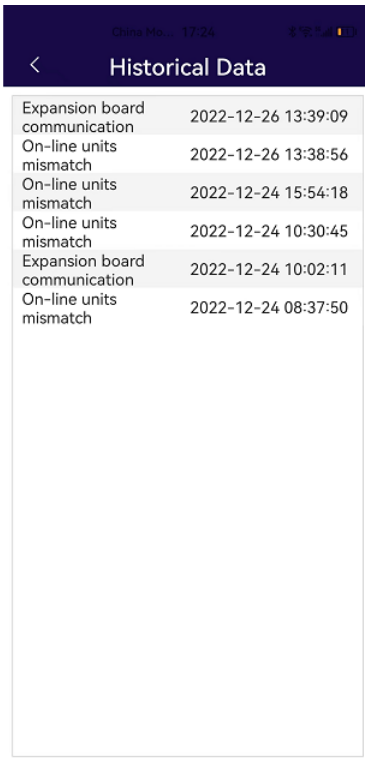
3.Users can view the values of different parameters

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 :


Search Operation Name
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 ℃
High pressure saturation 0 ℃
Low pressure saturation 0 ℃
External ambient temperature T1 0 ℃
Coil temp. (fin heat exchanger) T2 0 ℃
Heat exchanger temp. T3 0 ℃
Suction temperature T4 0 ℃
Exhaust temperature T5 0 ℃
Return Temp. 0 ℃


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

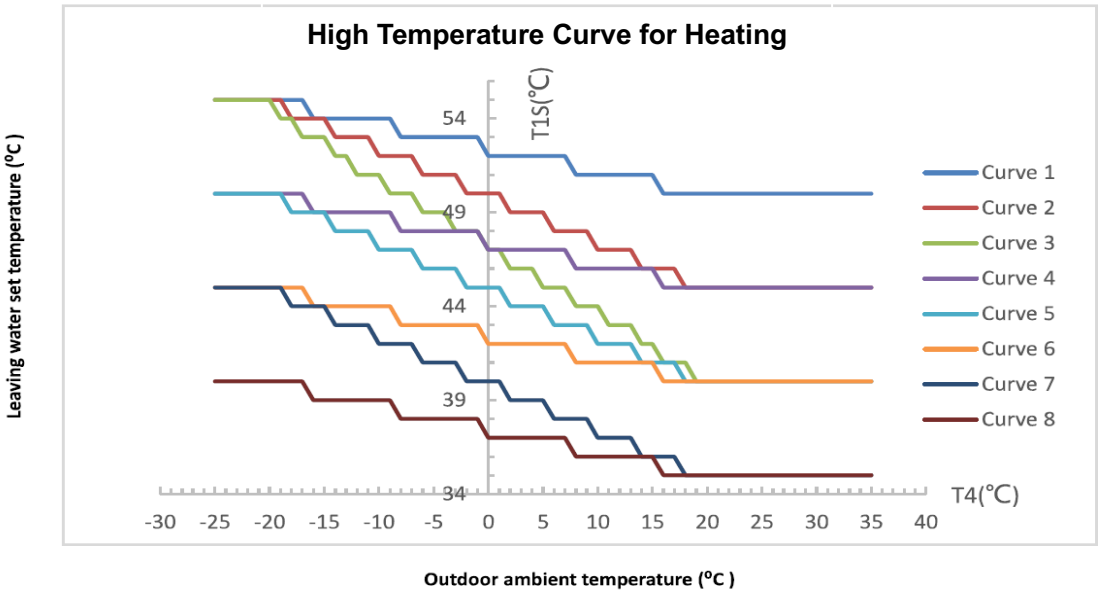
High Temperature Curve for Cooling		Low Temperature for Curve Cooling	
Curves No.	**Corresponding Curve**	**Curves No.**	**Corresponding Curve**
CH1	Heating Curve 1	CL1	Heating Curve 1
CH2	Heating Curve 2	CL2	Heating Curve 2
CH3	Heating Curve 3	CL3	Heating Curve 3
CH4	Heating Curve 4	CL4	Heating Curve 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/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥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/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥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	/	/

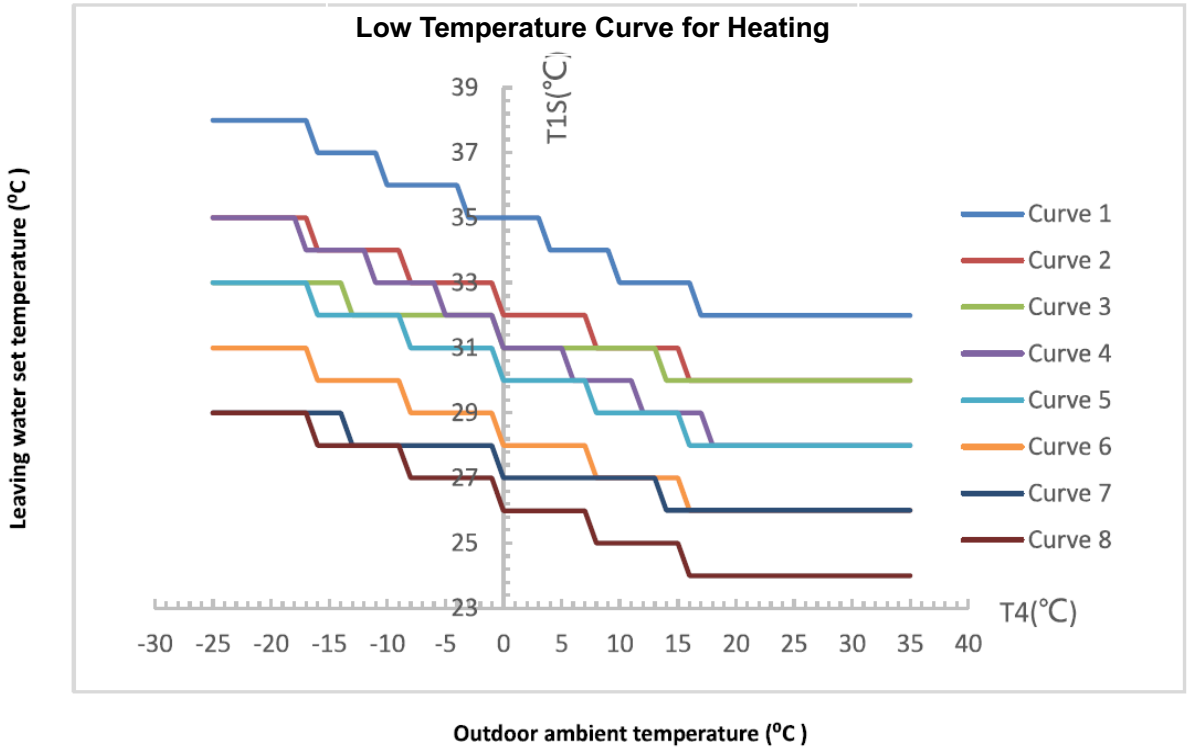
NOTE: Curve 4 and Curve 6 are ECO energy saving curves



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

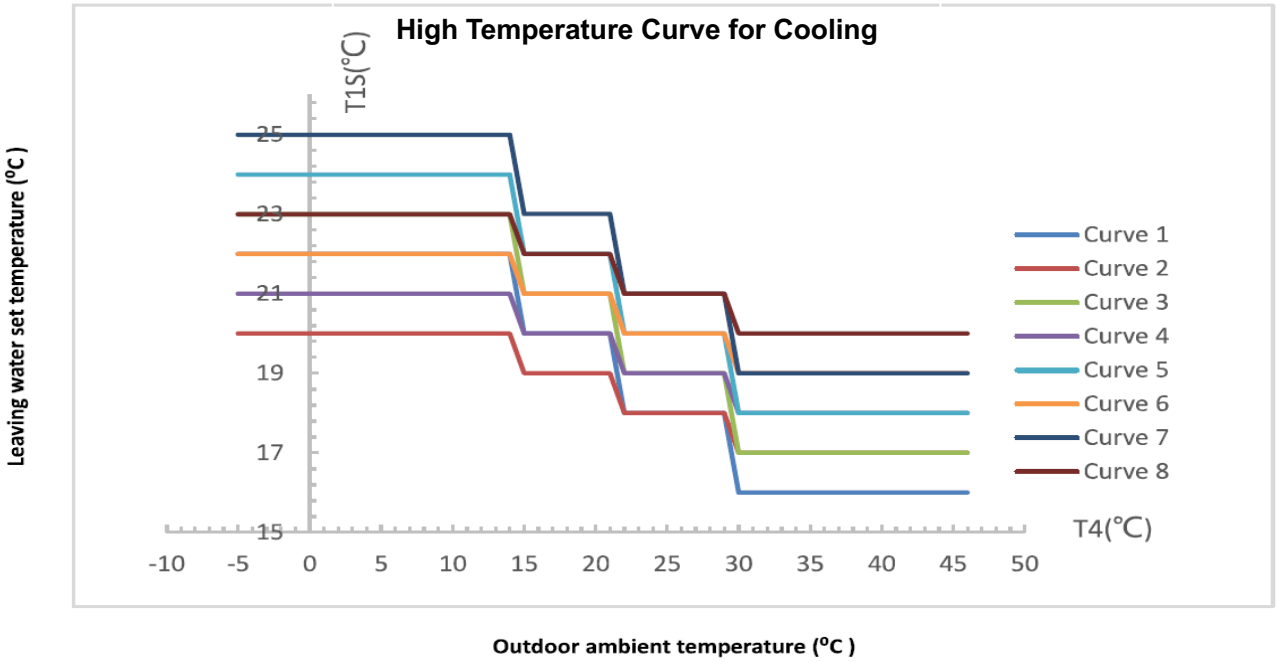
HL5		HL6		HL7		HL8	
Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥16	28	≥16	26	≥14	26	≥16	24
8≤T＜16	29	8≤T＜16	27	0≤T＜14	27	8≤T＜16	25
0≤T＜8	30	0≤T＜8	28	-14≤T＜0	28	0≤T＜8	26
-8≤T＜0	31	-8≤T＜0	29	＜-14	29	-8≤T＜0	27
-16≤T＜-8	32	-16≤T＜-8	30	/	/	-16≤T＜-8	28
＜-16	33	＜-16	31	/	/	＜-16	29

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

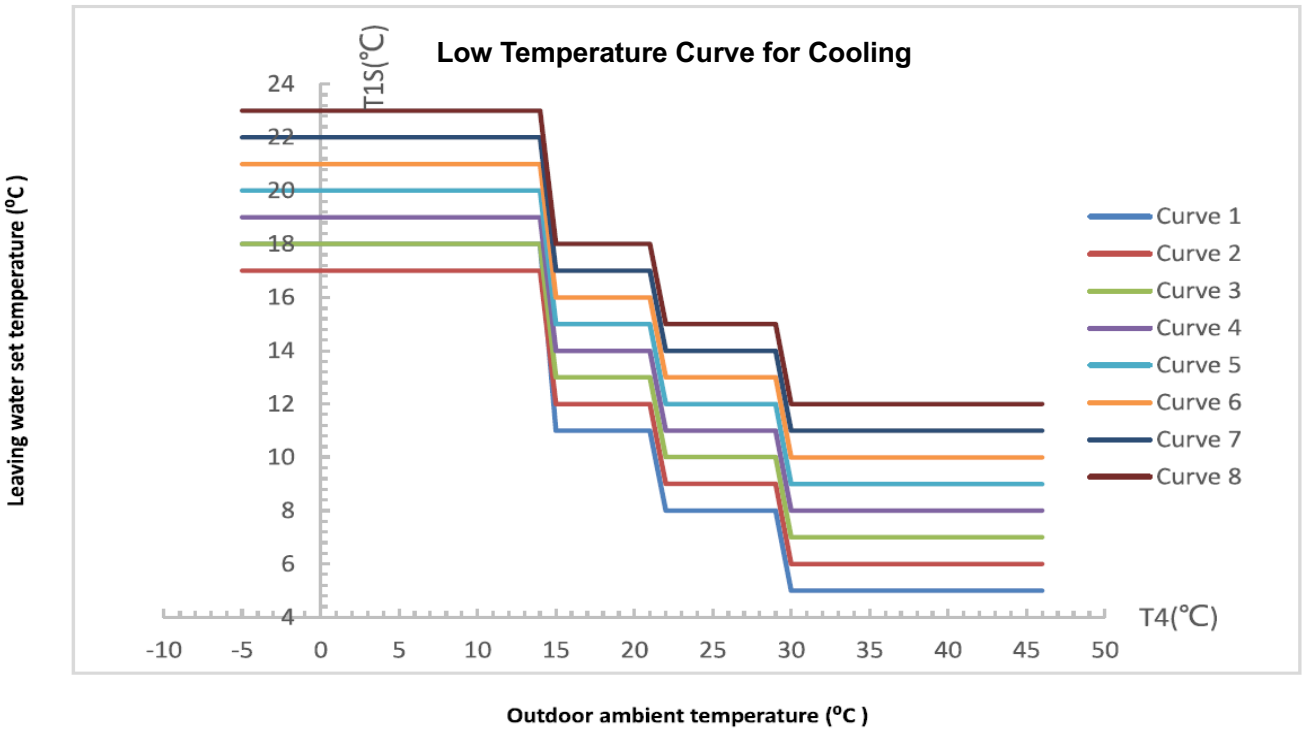


4.1.2 Cooling Curves

High Temperature Curve for Cooling (CH Curve)							
CH1		CH2		CH3		CH4	
Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥30	16	≥30	17	≥30	17	≥30	18
22≤T＜30	18	22≤T＜30	18	22≤T＜30	19	22≤T＜30	19
16≤T＜22	20	16≤T＜22	19	16≤T＜22	21	16≤T＜22	20
＜16	22	＜16	20	＜16	23	＜16	21
CH5		CH6		CH7		CH8	
Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥30	18	≥30	19	≥30	19	≥30	20
22≤T＜30	20	22≤T＜30	20	22≤T＜30	21	22≤T＜30	21
16≤T＜22	22	16≤T＜22	21	16≤T＜22	23	16≤T＜22	22
＜16	24	＜16	22	＜16	25	＜16	23
NOTE: Curve 4 and Curve 6 are ECO energy saving curves							

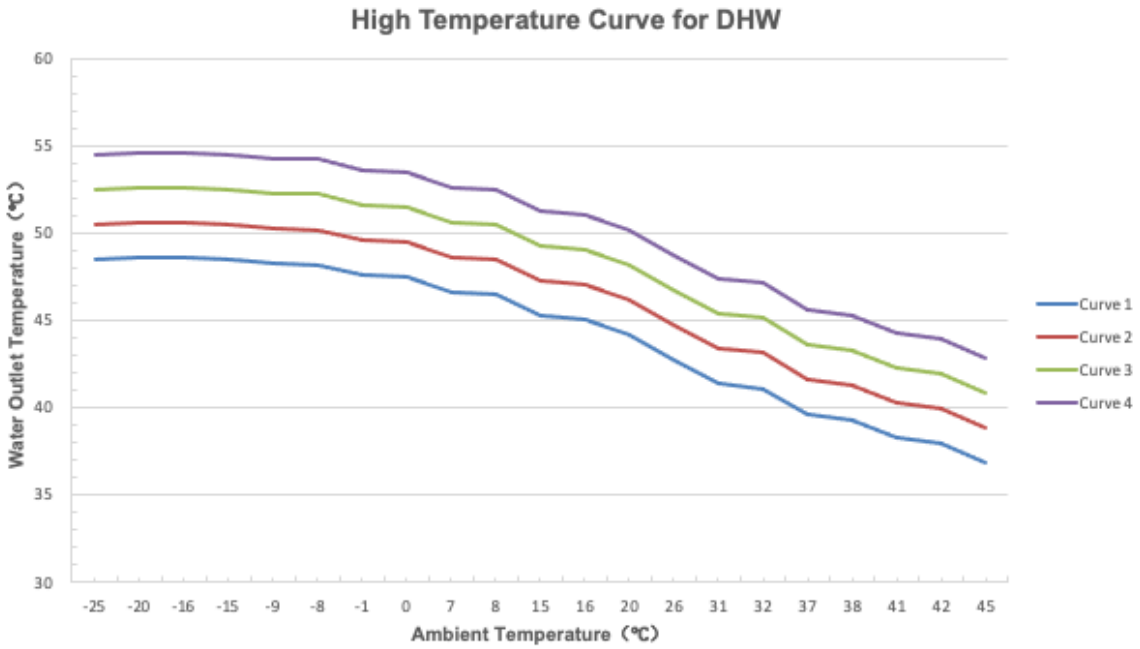


Low Temperature Curve for Cooling (CL Curve)							
CL1		CL2		CL3		CL4	
Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥30	5	≥30	6	≥30	7	≥30	8
20≤T＜30	8	20≤T＜30	9	20≤T＜30	10	20≤T＜30	11
16≤T＜22	11	16≤T＜22	12	16≤T＜22	13	16≤T＜22	14
＜16	17	＜16	18	＜16	18	＜16	19
CL5		CL6		CL7		CL8	
Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)	Ambient Temp.(T/℃)	Water Outlet Temp. (℃)
≥30	9	≥30	10	≥30	11	≥30	12
20≤T＜30	12	20≤T＜30	13	20≤T＜30	14	20≤T＜30	15
16≤T＜22	15	16≤T＜22	16	16≤T＜22	17	16≤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/℃)	Water Outlet Temp. (℃)			
	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

Error Code	Error Description	Troubleshooting
E12	Exhaust Temp. Too High	1.Fluorine system clogging
		2.Lack of refrigerant in the fluorine system or bad sensor
E14	DHW 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	Outer 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 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

Error Code	Error Description	Troubleshooting
		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

Compressor Drive Error Description Table		
	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.	-40～140℃	38	System 2 Compressor IPM Temp.	
9	High Pressure Saturation Temp.	-50～200℃	39	System 2 High Pressure Saturation Temp.	

No.	Description	Setting Range	No.	Description	Setting Range
10	Low Pressure Saturation Temp.	-50～200℃	40	System 2 Low Pressure Saturation Temp.	
11	Ambient Temp. T7	-40～140℃	41	System 2 Outer Coil Temp.	
12	Outer Coil Temp. T1	-40～140℃	42	System 2 Inner Coil Temp.	
13	Inner Coil Temp. T4	-40～140℃	43	System 2 Suction Temp.	
14	Suction Temp. T2	-40～140℃	44	System 2 Exhaust Temp.	
15	Exhaust Temp. T3	0～150℃	45	System 2 Economizer Inlet Temp.	
16	Water Inlet Temp. T8	-40～140℃	46	System 2 Economizer Outlet Temp.	
17	Water Outlet Temp. T15	-40～140℃	47	Reserve	
18	Economizer Inlet Temp. T5	-40～140℃	48	Reserve	
19	Economizer Outlet Temp. T6	-40～140℃	49	Reserve	
20	Current Unit Tool Number	0～120	50	Reserve	
21	DHW Tank Temp.	-40～140℃	51	Solar Water Heater Temp.	
22	Plate Heat Exchanger Exhaust Temp.	-40～140℃	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.	-40～140℃	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	70℃	50-80℃	
L22	DHW return water Setting	0	0～3	0-Disable / 1-Continuous return / 2-Cycle return / 3-Temperature
L23	Return Water Temp Setting	40℃	20～65℃	
L24	Return Water Return Temp Differential	5℃	1～15℃	
L25	Return Water Interval Period	30min	3～90min	
L26	Return Water Running Period	5min	1～30min	
P03	Water Flow Switch Setting	1	1~2	0-Enable/1-Disable
P05	Linkage Switch Setting		0～2	0-Enable/1-Disable/2-Thermostatic

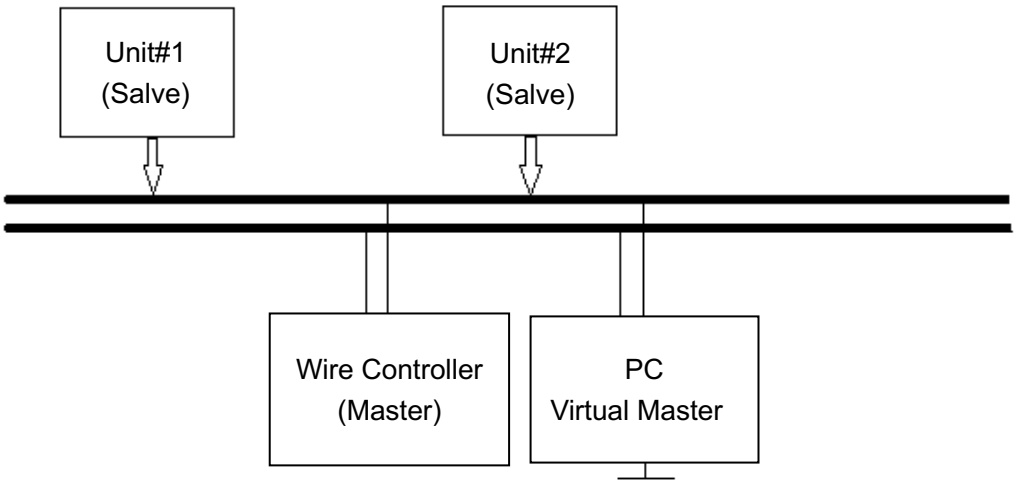
No.	Description	Default Value	Setting Range	Note
P22	Ambient temperature value- Unit no starting	-15	-15～40	If Ambient Temp. ≤P22 then enter defrost
P24	Ambient temperature value- Allow electric heater to start	0	-10～10℃	
P25	Overprotection value- Inlet and outlet water temperature differential	0	-10～10℃	
P26	Compensation value-Return water temperature	5	0～10℃	
P27	Floor heating return differential value	5	0～10℃	
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	0～10min	
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
P48	Enable/Disable Hot Water Tank temperature sensor	0	0～1	0-Disable/1-Enable
P96	DHW differential value	5	0～10℃	
P99	Water pump speed regulation temperature differential	5	2～10℃	
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℃	
P139	Buffer tank electric heating	0	0/1	0-Enable/1-Disable/2-AHS
P140	DHW electric heating			0-Enable/1-Disable/2-AHS
P150	Water pump - secondary heating/cooling system	0/1/2/3	2	

No.	Description	Default Value	Setting Range	Note
P151	Return differential - Hot water heat source	0-40	0	
P152	Return differential - Heating heat source	0-40	0	
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
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

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 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 ⩾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 ⩾ 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.					
Adress	**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 1Target Frequency	Real Value		R	
0x0028	Compressor 2 Target Frequency	Real Value		R	
.....				R	
0x003F	Reserve				

2. Real-time data 0x0040～0x00FF Includes: temperature, voltage, pressure, expansion valve opening and other data					
Adress	**Name**	**Address Ranges**	**Default Value**	**Read-Write**	**Note**

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	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
Running Status 1 (1: Enable) (0: Disable)	Bit0	Refrigerant Recovery		**Running Status 2 (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
System 1 Error Status 1	Bit0	High Pressure Switch Failure
	Bit1	Low Pressure Switch Failure
	Bit2	High Pressure Too High
	Bit3	High Pressure Too Low
	Bit4	Exhaust Pressure Too High
	Bit5	Current Protection
	Bit6	Coil Pressure Too High
	Bit7	Coil Temp. Sensor Failure
	Bit8	Suction Temp. Sensor Failure
	Bit9	Exhaust Temp. Sensor Failure
	Bit10	Economizer Inlet Temp. Sensor Failure
	Bit11	Economizer Outlet Temp. Sensor Failure
	Bit12	Fan Drive Board Communication Failure
	Bit13	Fan Failure
	Bit14	Cooling Coil Temp. Sensor Failure
	Bit15	Reserve

Name	Bit	Status Valve
System 1 Error Status 2	Bit0	High Pressure Sensor Failure
	Bit1	Low Pressure Sensor Failure
	Bit2	Middle Pressure Switch Failure
	Bit3	Coil Temp. Too High
	Bit4	Compressor Drive Board Communication Failure
	Bit5	
	Bit6	
	Bit7	
	Bit8	
	Bit9	
	Bit10	
	Bit11	
	Bit12	
	Bit13	
	Bit14	
	Bit15	

Name	Bit	Status Valve
System 1 Driver Board Error Status 1	Bit0	IPM Overcurrent/IPM Module Protection
	Bit1	Compressor Driver Failure
	Bit2	Compressor Overcurrent
	Bit3	Input Voltage Missing Phase
	Bit4	IPM Current Sampling Failure
	Bit5	Power Component Overheating and Shutdown
	Bit6	Pre-charge Failure
	Bit7	DC Bus Overvoltage
	Bit8	DC Bus Undervoltage
	Bit9	AC Input Undervoltage
	Bit10	AC Input Overvoltage
	Bit11	Input Voltage Sampling Failure

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

Name	Bit	Status Valve
System 2 Driver Board Error Status 2	Bit0	Compressor Overcurrent Alarm
	Bit1	Compressor Weak Magnetic Protection Alarm
	Bit2	PIM Overheat Alarm
	Bit3	PFC Overheat Alarm
	Bit4	AC Input Overcurrent Alarm
	Bit5	EEPROM Error Alarm
	Bit6	N/A
	Bit7	EEPROM Refresh Complete
	Bit8	Temperature Sensing Failure Limit
	Bit9	AC Undervoltage Frequency Limit Protection Alarm；
	Bit10	N/A
	Bit11	N/A
	Bit12	N/A
	Bit13	N/A
	Bit14	N/A
	Bit15	N/A

Name	Bit	Status Valve
Relay Status 1 0x0019	Bit0	DHW Electric Heater
	Bit1	Fan High Wind Level
	Bit2	

Name	Bit	Status Valve
Relay Status 2 0x001A	Bit0	Compressor 1
	Bit1	Liquid Injection Valve 1
	Bit2	EVI EEV 1

(1: Load Enable) (0: Load Disable)	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	Bulit-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
Switch Status 3	Bit0			Switch Status 4	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	

3.Factory Parameter 0x0200～0x03FF

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	℃

0x010C	High pressure frequency limit value	40～150	RW	℃
0x010D	Low pressure protection value	-50～-10	RW	℃
0x010E	Low pressure frequency limit value	-50～-10	RW	℃
0x010F	Exhaust temperature protection value	100～130	RW	℃
0x0110	Exhaust temperature frequency limit value	90～120	RW	℃
0x0111	Fan speed-up value-Cooling	0～60	RW	℃
0x0112	Fan speed-down value-Cooling	0～60	RW	℃
0x0113	Fan speed-down value-Heating	0～60	RW	℃
0x0114	Fan speed-up value-Heating	0～60	RW	℃
0x0115	Ambient temperature value- Unit no starting	-40～-10	RW	℃
0x0116	Ambient temperature value- Allow electric heater to start	-15～40	RW	℃
0x0117	Overprotection value- Inlet and outlet water temperature differential	10～30	RW	℃
0x0118	Compensation value-Return water temperature	-10～10℃	RW	℃
0x0119	Compensation value-Outlet water temperature	-10～10℃	RW	℃
0x011A	H&C return differential value	0～10℃	RW	℃
0x011B	Floor heating return differential value	0～10℃	RW	℃
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	℃
0x0120	Defrosting - coil temperature value	-30～0	RW	℃
0x0121	Defrosting - temperature differential 1	0～20	RW	℃
0x0122	Defrosting - temperature differential 2	0～20	RW	℃
0x0123	Maximum defrosting time	0～30	RW	℃
0x0124	Exit defrosting - coil temperature	0～30	RW	℃
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-Diasble
0x0128	Correction value - Cooling target overheat	-5～10	RW	℃
0x0129	Correction value - Heating high voltage protection and frequency limiting	-10～10	RW	℃
0x012A	Correction value - Heating target overheat	-5～10	RW	℃
0x012B	Medium Pressure Switch Setting	0～10	RW	0-Disable/1-Ensble

0x012C	Water flow switch failure detection setting	0～10	RW	0-Enable/1-Diasble
0x012D	Communication address code	1～16	RW	
0x012E	Return differential - liquid injection solenoid valve opening	0～15	RW	℃
0x012F	EVI target overheat constant	0～12	RW	
0x0130	Enable/Disable Hot Water Tank temperature sensor	0～10	RW	0-Disable/1-Ensble
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	℃
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	℃
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	℃
0x0161	Water tank temperature automatic compensation	0～10	RW	0-Enable/1-Diasble
0x0162	Water tank temperature manual compensation	-10～10	RW	℃
0x0163	Water pump speed regulation temperature differential	2～10	RW	℃
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	℃
0x016A	Heating mode running - Maximum allowed ambient temperature	10～60	RW	℃
0x016B	Hot water mode running - highest ambient temperature	10～60	RW	℃
0x016C	Hot water set temperature - highest temperature	30～80	RW	℃

0x016D	Hot water set temperature - lowest temperature	10～30	RW	℃
0x016E	Heating set temperature - highest temperature	30～80	RW	℃
0x016F	Heating set temperature - lowest temperature	15～30	RW	℃
0x0170	Cooling set temperature - highest temperature	20～40	RW	℃
0x0171	Cooling set temperature - lowest temperature	5～20	RW	℃
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	℃
0x0176	Outlet water temperature - Allow access to anti-freeze	0～20	RW	℃
0x0177	Refrigerant type	0～20	RW	1-R410A/2-R32/3-R290
0x0178	Enable/Disable - Anti-condensation function	0～10	RW	0-Enable/1-Diasble
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	℃
0x0188	Ambient temperature - Allow throttling bypass valve to open	-20～50	RW	℃
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	℃
0x0190	Ambient temperature - Allow defrosting	-20～30	RW	℃
0x0191	Antifreze protection value - heat exchanger	-20～10	RW	℃
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	℃
0x0195	Limit frequency value - Overheat outlet temperature	40-80	RW	℃
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	℃
0x0198	Return differential - Heating heat source	0-40	RW	℃
0x0199	Upper temperature limit - Hot water heat source combined temperature	15-80	RW	℃
0x019A	Upper temperature limit - Heating water heat source combined temperature	15-80	RW	℃
0x019B	Compressor code	0～9999	RW	
0x019C	ON/OFF - Auxiliary electronic expansion valve	0～10	RW	0-Enable/1-Diasble
0x019D	Auxiliary electronic expansion valve to reduce the temperature differential	0～99	RW	℃
0x019E	Ambient temperature - Heating Limit Outlet Temperature	-45～30	RW	℃
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	℃
0x01A6	Lightening back to the poor	1～15	RW	℃
0x01A7	Stop back to the poor	1～15	RW	℃
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	℃
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	℃
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	℃
0x01CD	C1 working condition main valve target overheat	-10～10	RW	℃

0x01CE	B1 working condition main valve target overheat	-10～10	RW	℃
0x01CF	A1 working condition main valve target overheat	-10～10	RW	℃
0x01D0	F1 working condition main valve target overheat	-10～10	RW	℃
0x01D1	D2 working condition main valve target overheat	-10～10	RW	℃
0x01D2	C2 working condition main valve target overheat	-10～10	RW	℃
0x01D3	B2 working condition main valve target overheat	-10～10	RW	℃
0x01D4	A2 working condition main valve target overheat	-10～10	RW	℃
0x01D5	F2 working condition main valve target overheat	-10～10	RW	℃
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	℃
0x01E1	C1 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E2	B1 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E3	A1 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E4	F1 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E5	D2 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E6	C2 working condition auxiliary valve target overheat	-10～10	RW	℃
0x01E7	Auxiliary valve target overheats in B2 working condition	-10～10	RW	℃
0x01E8	Auxiliary valve target overheats in A2 working condition	-10～10	RW	℃
0x01E9	Auxiliary valve target overheats in F2 working condition	-10～10	RW	℃
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	℃
0x01FB	PFC shutdown current	0～50	RW	A
0x01FC	Target overheat of main valve under high water temperature rated condition	-10～10	RW	℃
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	℃

4. User Parameter 0x0300～0x032F

Adress	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 Low 8-bit: heating curve		RW	
0x030D	Hot water/cooling curve setting	High 8-bit: cooling curve Low 8-bit: hot water curve		RW	
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

5. User Commands 0x0330～0x035F
Unit forced control, frequency/speed of forced control

Adress	Name	Address Ranges		Default Value	Read-Write	Note
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)

Adress	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

11.Fatory Parameter L 0x0800～0x083F
Parameter numbers start from L11; L0-L10 remain unchanged.

Adress	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	50-80℃	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				

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

Adress	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				

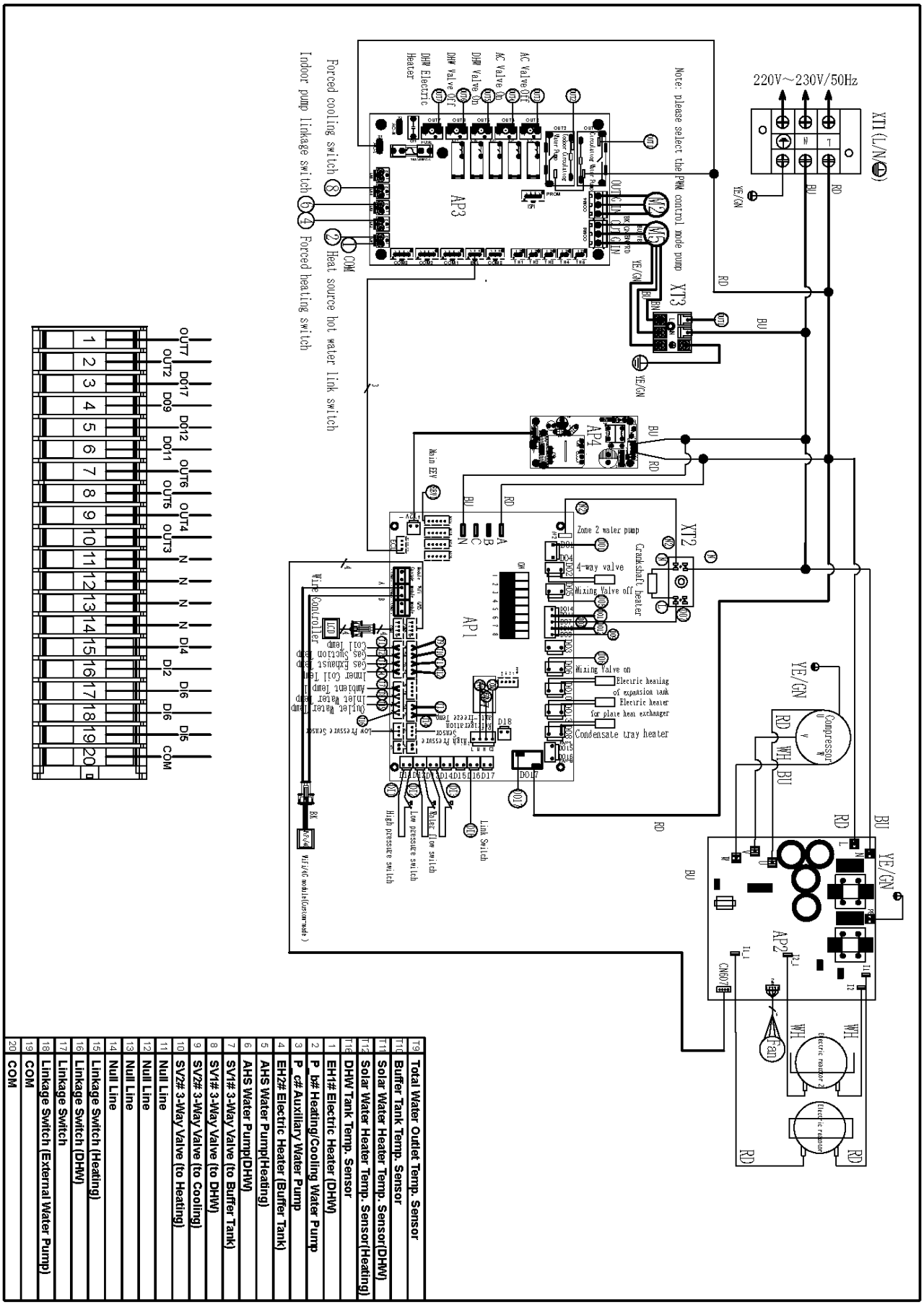
4.5 Previous Versions of Electrical Information

Please determine the version information according to the wiring diagram on the unit and then check the corresponding information.

Version	Difference Information	
	Number of Terminal	Main Functions
V1.0	20#	Initial version
V2.0	20#+10#	1.Add SG Ready 2.Add dual-zone temperature control 3. Add DHW water return function 4. Update the definition of terminal output 5. Add IOT control module
V2.1(Latest)	20#+10#	1. Add power statistics module

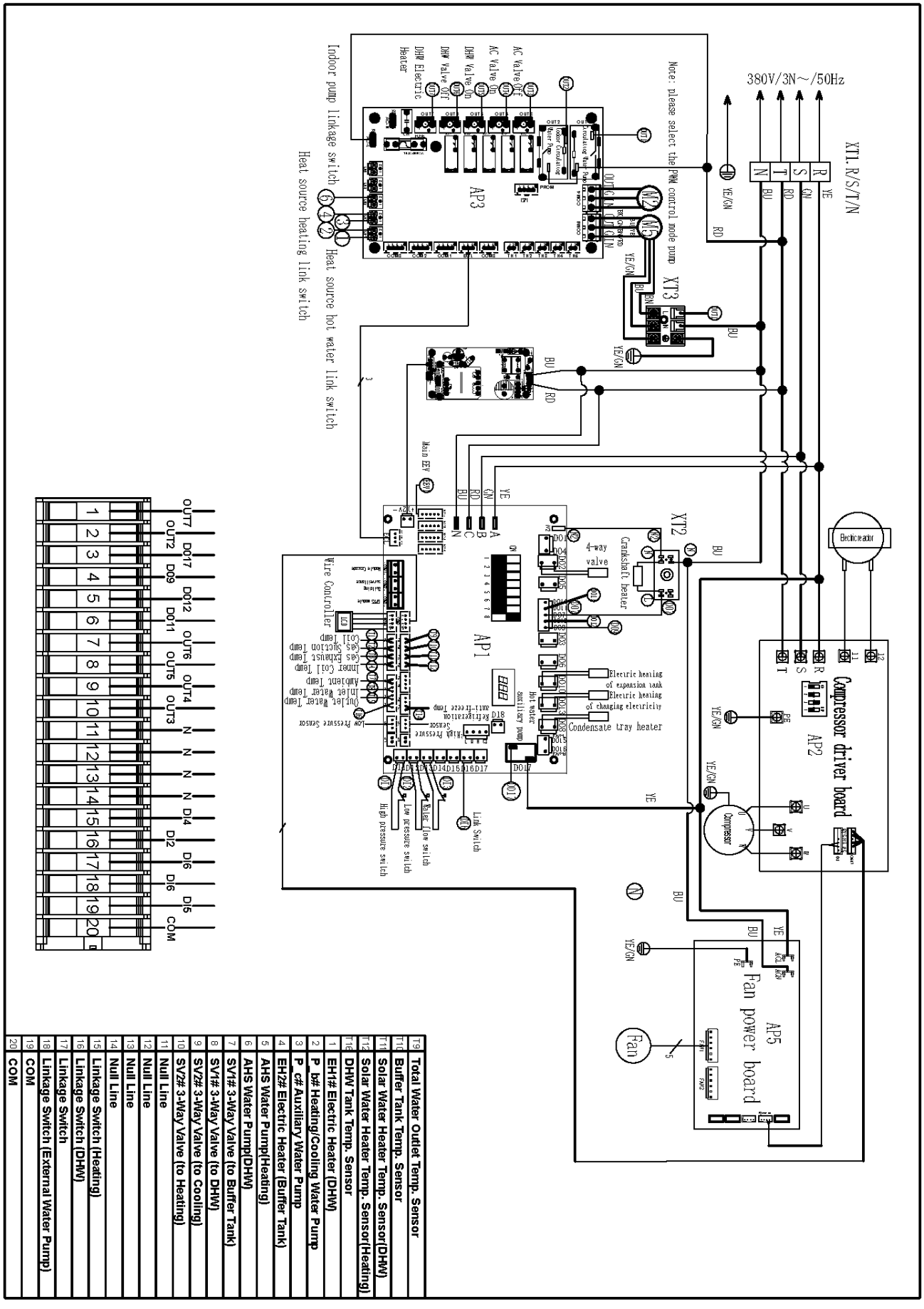
4.5.1 Wire Diagram V1.0

4.5.1.1 Single Phase



T9	Total Water Outlet Temp. Sensor
T10	Buffer Tank Temp. Sensor
T11	Solar Water Heater Temp. Sensor(DHW)
T12	Solar Water Heater Temp. Sensor(Heating)
T13	DHW Tank Temp. Sensor
1	EH1# Electric Heater (DHW)
2	P_b# Heating/Cooling Water Pump
3	P_c# Auxiliary Water Pump
4	EH2# Electric Heater (Buffer Tank)
5	AHS Water Pump(Heating)
6	AHS Water Pump(DHW)
7	SV1# 3-Way Valve (to Buffer Tank)
8	SV1# 3-Way Valve (to DHW)
9	SV2# 3-Way Valve (to Cooling)
10	SV2# 3-Way Valve (to Heating)
11	Null Line
12	Null Line
13	Null Line
14	Null Line
15	Linkage Switch (Heating)
16	Linkage Switch (DHW)
17	Linkage Switch
18	Linkage Switch (External Water Pump)
19	COM
20	COM

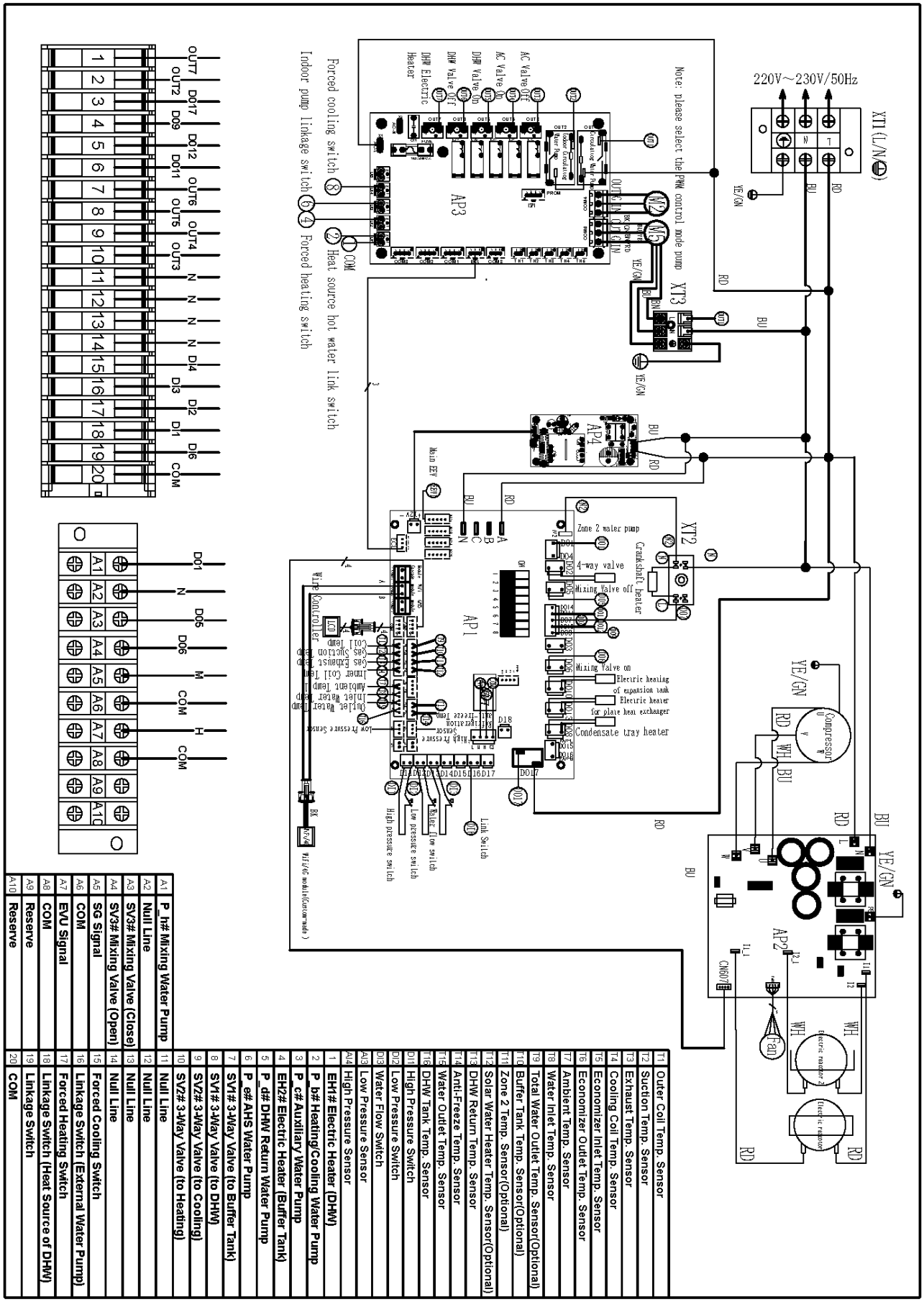
4.5.1.2 Thress Phase



T9	Total Water Outlet Temp. Sensor
T10	Buffer Tank Temp. Sensor
T11	Solar Water Heater Temp. Sensor(DHW)
T12	Solar Water Heater Temp. Sensor(Heating)
T13	DHW Tank Temp. Sensor
1	EH1# Electric Heater (DHW)
2	P_b# Heating/Cooling Water Pump
3	P_c# Auxiliary Water Pump
4	EH2# Electric Heater (Buffer Tank)
5	AHS Water Pump(Heating)
6	AHS Water Pump(DHW)
7	SV1# 3-Way Valve (to Buffer Tank)
8	SV1# 3-Way Valve (to DHW)
9	SV2# 3-Way Valve (to Cooling)
10	SV2# 3-Way Valve (to Heating)
11	Null Line
12	Null Line
13	Null Line
14	Null Line
15	Linkage Switch (Heating)
16	Linkage Switch (DHW)
17	Linkage Switch
18	Linkage Switch (External Water Pump)
19	COM
20	COM

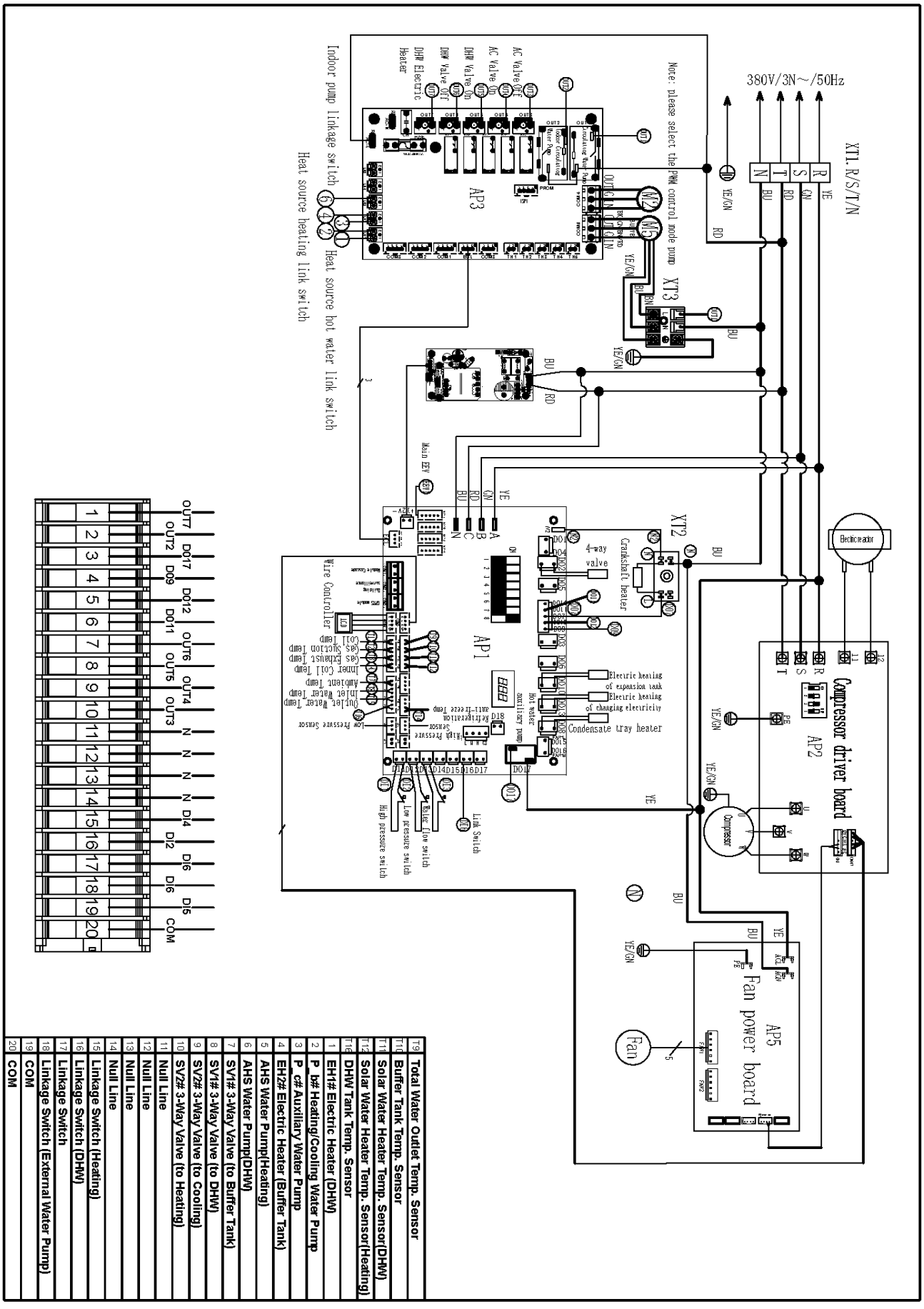
4.5.2 Wire Diagram V2.0

4.5.2.1 Single Phase



A1	P_h# Mixing Water Pump	T1	Outer Coil Temp. Sensor
A2	Null Line	T2	Suction Temp. Sensor
A3	SV3# Mixing Valve (Close)	T3	Exhaust Temp. Sensor
A4	SV3# Mixing Valve (Open)	T4	Cooling Coil Temp. Sensor
A5	SG Signal	T5	Economizer Inlet Temp. Sensor
A6	COM	T6	Economizer Outlet Temp. Sensor
A7	EVU Signal	T7	Ambient Temp. Sensor
A8	COM	T8	Water Inlet Temp. Sensor
A9	Reserve	T9	Total Water Outlet Temp. Sensor(Optional)
A10	Reserve	T10	Buffer Tank Temp. Sensor(Optional)
11	Null Line	T11	Zone 2 Temp. Sensor(Optional)
12	Null Line	T12	Solar Water Heater Temp. Sensor(Optional)
13	Null Line	T13	DHW Return Temp. Sensor
14	Null Line	T14	Anti-Freeze Temp. Sensor
15	Forced Cooling Switch	T15	Water Outlet Temp. Sensor
16	Linkage Switch (External Water Pump)	T16	DHW Tank Temp. Sensor
17	Forced Heating Switch	D11	High Pressure Switch
18	Linkage Switch (Heat Source of DHW)	D12	Low Pressure Switch
19	Linkage Switch	D13	Water Flow Switch
20	COM	A13	Low Pressure Sensor
		A14	High Pressure Sensor
		1	EH1# Electric Heater (DHW)
		2	P_b# Heating/Cooling Water Pump
		3	P_c# Auxiliary Water Pump
		4	EH2# Electric Heater (Buffer Tank)
		5	P_d# DHW Return Water Pump
		6	P_e# AHS Water Pump
		7	SV1# 3-Way Valve (to Buffer Tank)
		8	SV1# 3-Way Valve (to DHW)
		9	SV2# 3-Way Valve (to Cooling)
		10	SV2# 3-Way Valve (to Heating)

4.5.3.2 Thress Phase



19	Total Water Outlet Temp. Sensor
T10	Buffer Tank Temp. Sensor
T11	Solar Water Heater Temp. Sensor(DHW)
T12	Solar Water Heater Temp. Sensor(Heating)
T13	DHW Tank Temp. Sensor
1	EH1# Electric Heater (DHW)
2	P_b# Heating/Cooling Water Pump
3	P_c# Auxiliary Water Pump
4	EH2# Electric Heater (Buffer Tank)
5	AHS Water Pump(Heating)
6	AHS Water Pump(DHW)
7	SV1# 3-Way Valve (to Buffer Tank)
8	SV1# 3-Way Valve (to DHW)
9	SV2# 3-Way Valve (to Cooling)
10	SV2# 3-Way Valve (to Heating)
11	Null Line
12	Null Line
13	Null Line
14	Null Line
15	Linkage Switch (Heating)
16	Linkage Switch (DHW)
17	Linkage Switch
18	Linkage Switch (External Water Pump)
19	COM
20	COM