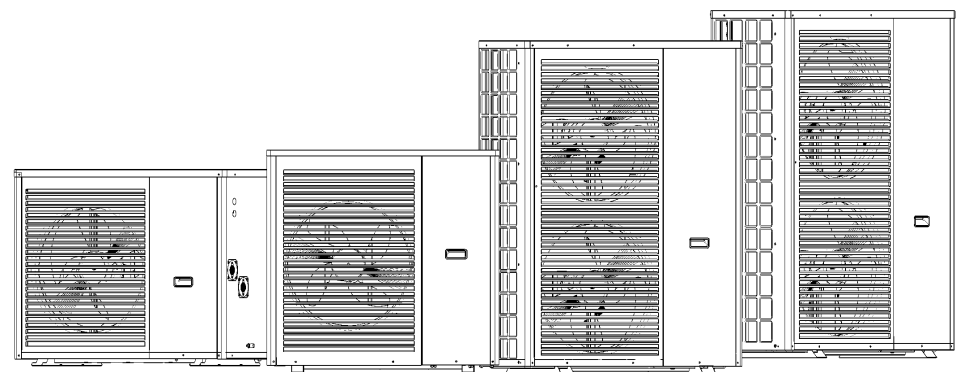




COOPER&HUNTER Corp., 2021

Technical Manual

Air to Water Heat Pumps



CH-HP08UIMPRM CH-HP12UIMPRM CH-HP20UIMPRM CH-HP24UIMPRM



www.cooperandhunter.com

Content

1. Preface.....	1
2. Safety Instructions.....	2
3. Features.....	3
4. Unit Dimension (mm).....	5
5. Installation Diagram.....	7
6. Handling & Installation.....	8
7. Maintenance.....	11
8. Parameters.....	13
9. Operation Range.....	14
10. Explosion View.....	47
11. Wiring Diagram.....	56
12. Display Operation Guide.....	59
13. Electrical Parameter.....	68
14. Failure List & Troubleshooting.....	72
15. MODBUS RTU PROTOCOL.....	77

1. Preface

In order to provide customers with high-quality, strong reliable and good versatile products, this heat pump is manufactured by strict design and manufacture standards.

This manual includes all the necessary information about installation, debugging and maintenance. Please read the manual carefully before you start or maintain the unit.

The manufacturer of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, unnecessary maintenance which is not in line with this manual.

The unit must be installed by qualified personnel.

It is vital that the below instructions are adhered to at all times to keep the warranty.

—The unit can only be turned on or repaired by a qualified installer or an authorized dealer.

—Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

—Use standard spare parts only.

Failure to comply with these recommendations will invalidate the warranty.

Inverter air to water heat pump is a kind of high efficiency, energy-saving and environment-friendly equipment, which is mainly used for house heating/cooling and hot water. It can work with indoor units such as fan coils, radiators, or floor heating, to provide heating or hot water. One heat pump can work with several indoor units.

2. Safety Instructions

To prevent the users and maintainers from the harm of this unit, and avoid damage on the unit or other property, and use the heat pump properly, please read this manual carefully and understand the following information correctly.

Mark Notes

Mark	Meaning
 WARNING	A wrong operation may lead to death or grievous injury on people.
 ATTENTION	A wrong operation may lead to harm on people or loss of material.

Icon Notes

Icon	Meaning
	Prohibition. What is prohibited will be nearby this icon.
	Compulsory implement. The listed action need to be taken.
	ATTENTION (include WARNING) Please pay attention to what is indicated.

Warning

Installation	Meaning
 Professional installer is required.	The heat pump must be installed by qualified personals, to avoid improper installation which may lead to water leakage, electrical shock or fire.
 Earthing is required.	Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.

Operation	Meaning
 PROHIBITION	DO NOT put fingers or others into the fans and evaporator of the unit, otherwise harm may occur.
 Shut off the power.	When there is something wrong or strange smell, the power supply needs to be shut off to stop the unit. Continue running may cause short circuit or fire.

Move and Repair	Meaning
 Entrust	When the heat pump needs to be moved or installed again, please entrust dealer or qualified person to carry it out. Improper installation will lead to water leakage, electrical shock, injury or fire.
 Entrust	It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may occur.
 Prohibit	



The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)

ATTENTION

Installation	Meaning
 Installation Place	The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire may occur.
 Fix the unit.	Make sure that the basement of the heat pump is strong enough, to avoid any decline or fall down of the unit
 Need circuit breaker.	Make sure that there is circuit breaker for the unit, lack of circuit breaker may lead to electrical shock or fire.

Operation	Meaning
 Check the installation basement.	Please check the installation basement regularly (one month), to avoid any decline or damage on the basement, which may hurt people or damage the unit.
 Switch off the power.	Please switch off the power when cleaning or maintenance.
 Prohibition	It is prohibited to use copper or iron as fuse. The right fuse must be fixed by electrician for the heat pump.
 Prohibition	It is prohibited to spray the flammable gas to the heat pump, as it may cause fire.

3. Features

With new technology of DC Inverter EVI, Series can be used in extremely cold area for heating/cooling, hot water. The Series is featured as follows.

3.1. DC Inverter EVI Heat Pump Technology

a. Ruking Driver Board

Ruking driver board controls the compressor running precisely basing on water temperature and air temperature. And it can work with wide voltage of 456V at maximum.

b. Panasonic Inverter Compressor

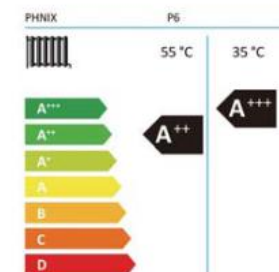
Panasonic inverter EVI compressor is adopted for the units to ensure high stability.

c. DC Fan Motor

DC fan motor with adjustable speed ensures the units' silent running. This makes the units work more efficiently at different conditions.

3.2. A+++ Energy Level

DC inverter technology enables the heat pump to adjust its frequency from 30Hz - 90Hz according to real heating requirement. With this technology, Series achieve an energy level of A+++ according to ErP directive.



3.3. Certification Guarant-junctiond

To meet the European market requirement, the series has achieved several certifications such as CE, ErP, MCS.



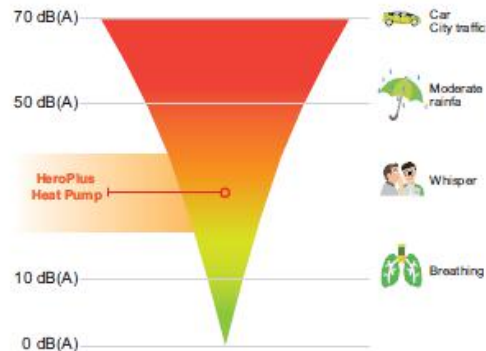
3.4. R32 Low GWP Gas

Compared with R410A refrigerant heat pumps, Series with R32 gas have a GWP of only one-third. It is an environment-friendly choice for reducing CO2 emission. Meanwhile, R32 heat pump needs 30% less amount than R410A heat pump.



3.5. Low Noise of 37dB(A)

With a new internal noise reducing design, can realize the lowest noise running of 37dB(A) when testing at 1 meter, so as to provide a silent living environment for users.



3.6. 5-inch Touch Display

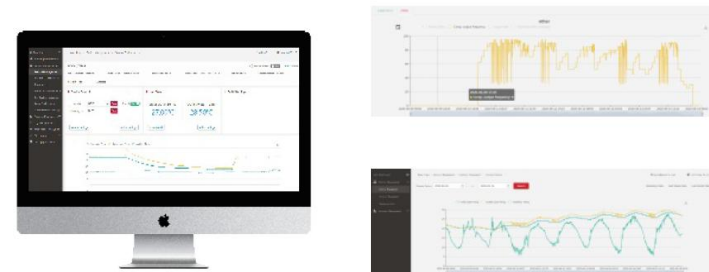
5-inch display has many powerful functions, such as water temperature curve, easy timing, one-key mute, and mute timer.



3.7. APP & IOT

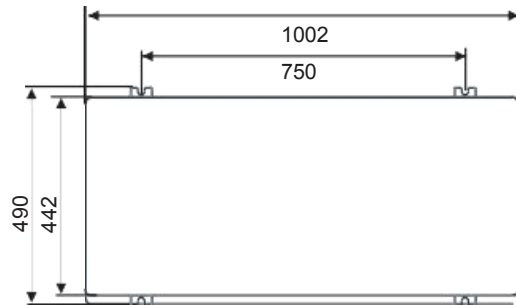
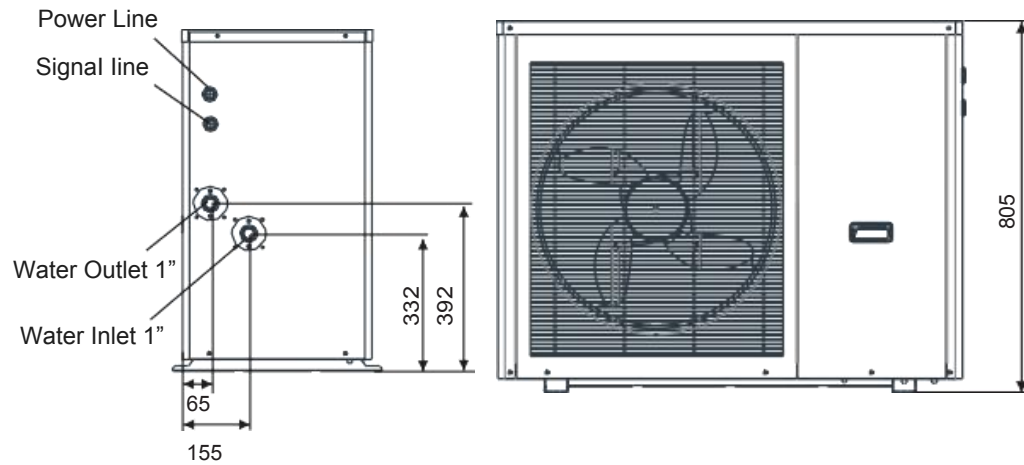
Simplify your life with WarmLink. Via connection by Wi-Fi or 4G, you can take full control of your heat pump from anywhere in your home or office with a single app on your smartphone.

Besides, has a central platform, which effectively saves the cost for manpower during the after-sales service period. The fault report button allows a direct error reporting channel to the local service provider. When an error has been reported, the service provider can see the error information of the target heat pump from the background system, and contact users immediately to offer help.

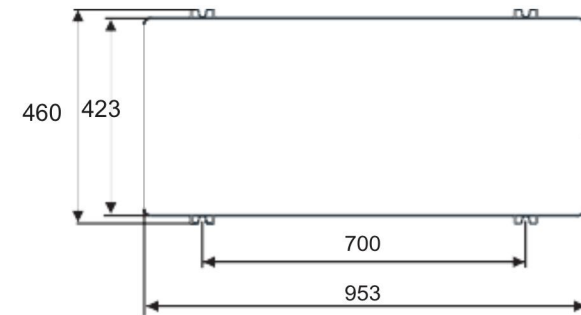
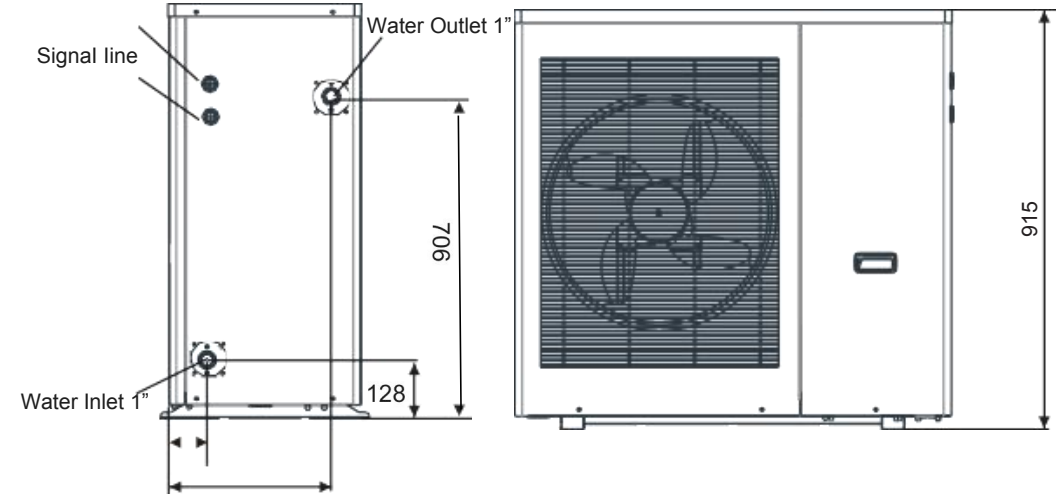


4. Unit Dimension (mm)

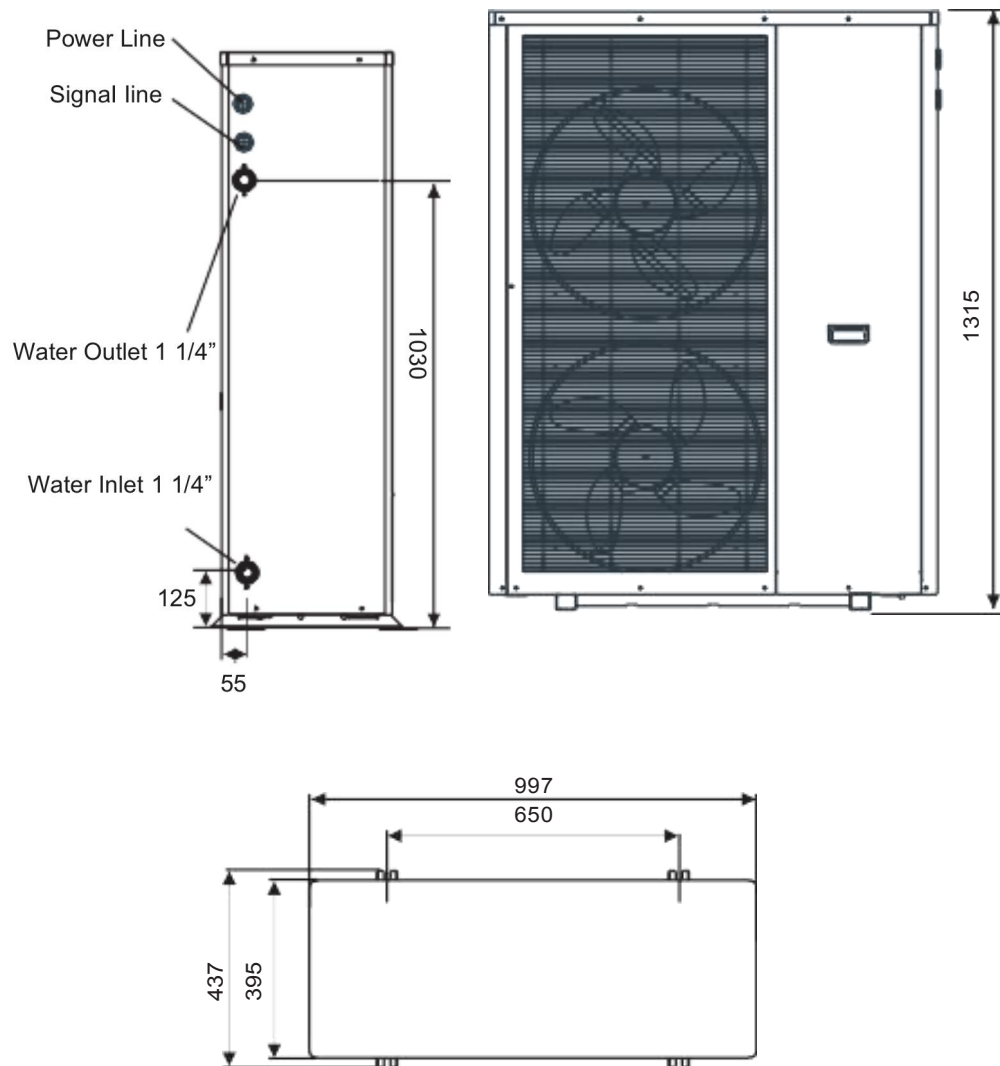
4.1. Models: CH-HP08UIMPRM



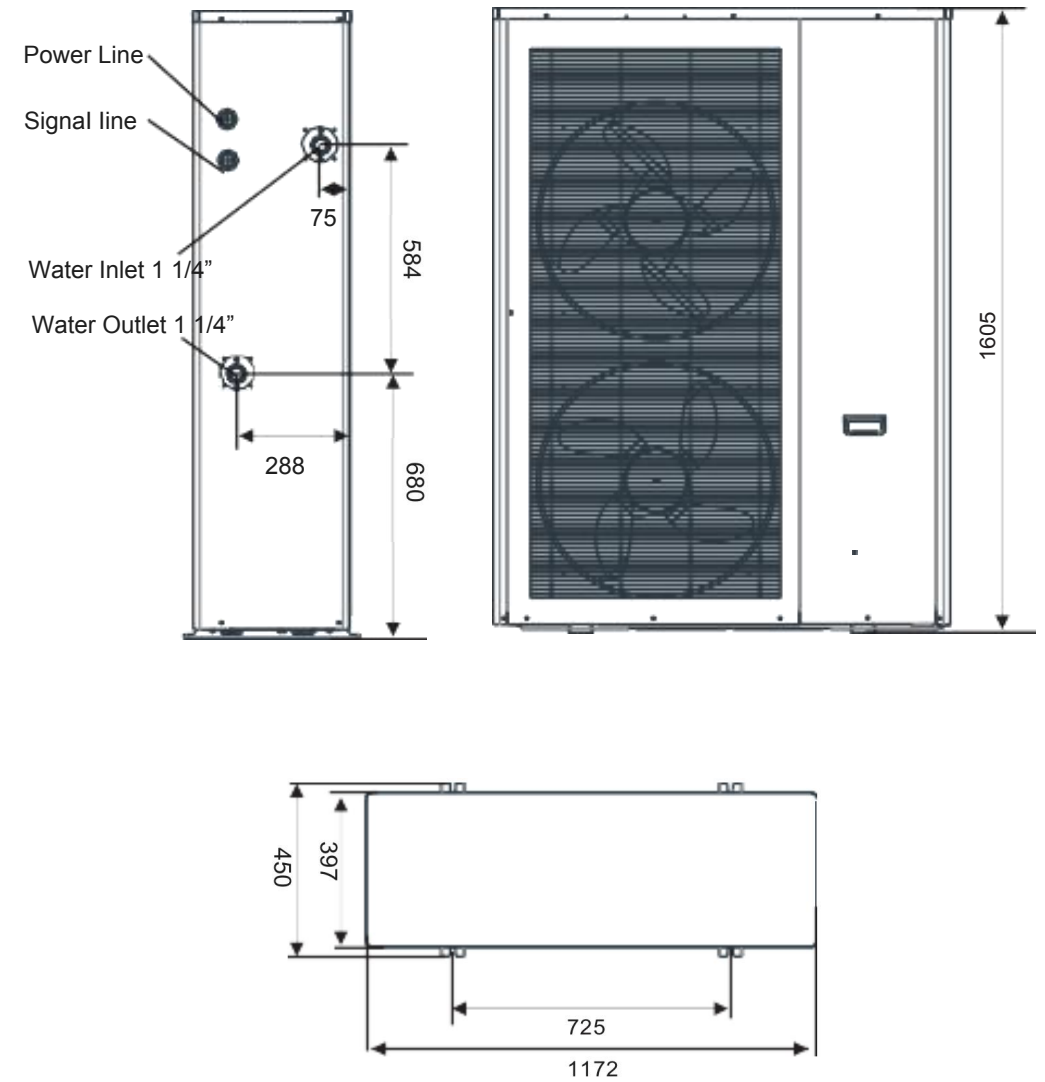
4.2. Models: CH-HP12UIMPRM



4.3. Models: CH-HP20UIMPRM



4.4. Models: CH-HP24UIMPRM

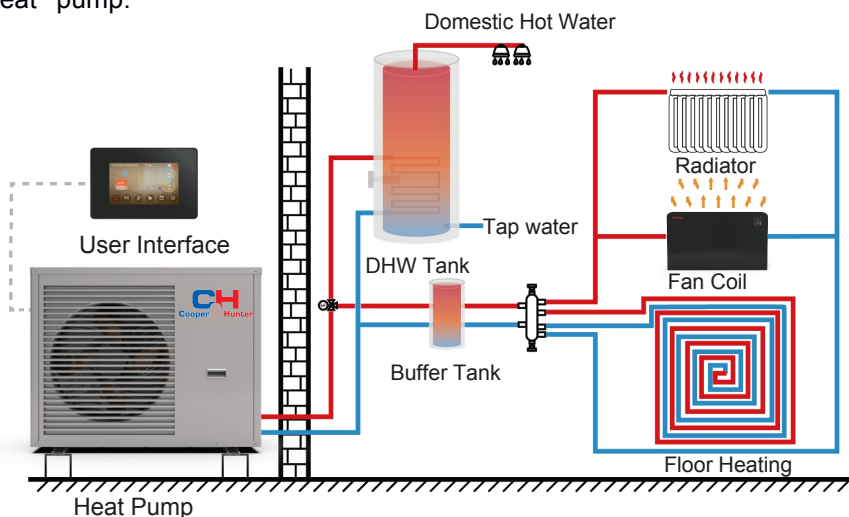


5. Installation Diagram

Monoblock heat pumps can provide heating/cooling and domestic hot water. Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to the heat pump.

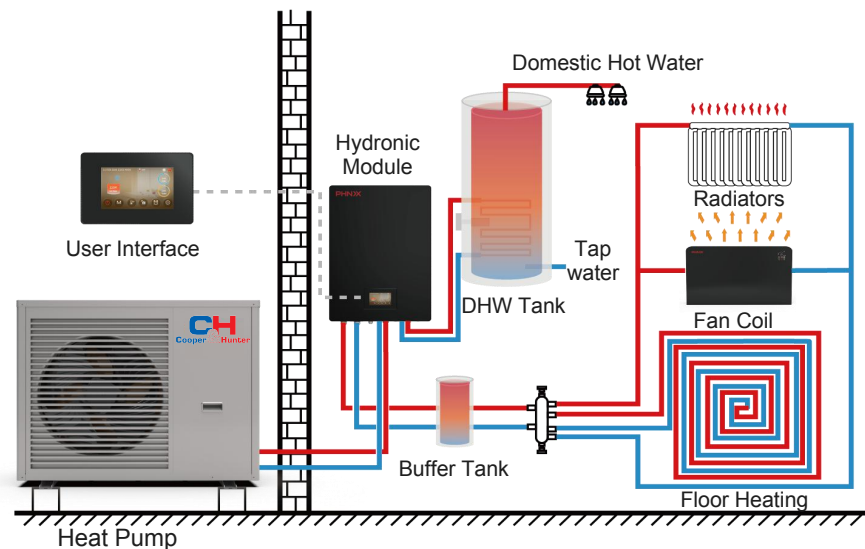
5.1 Traditional Installation

Provides the monoblock heat pump with main circulation pump built inside. When install the unit, installer should connect the heat pump with other parts including the buffer tank (for space heating/cooling), storage water tank (for domestic hot water) and water pumps (for space heating/cooling water circulation and domestic hot water). External fittings are also needed including the safety valve, water charge valve, hot water valves (three-way valve). Temperature sensor should be added in the storage water tank. Additional electric heater can be installed in the DHW tank or the buffer tank which can get the control signal from the heat pump.



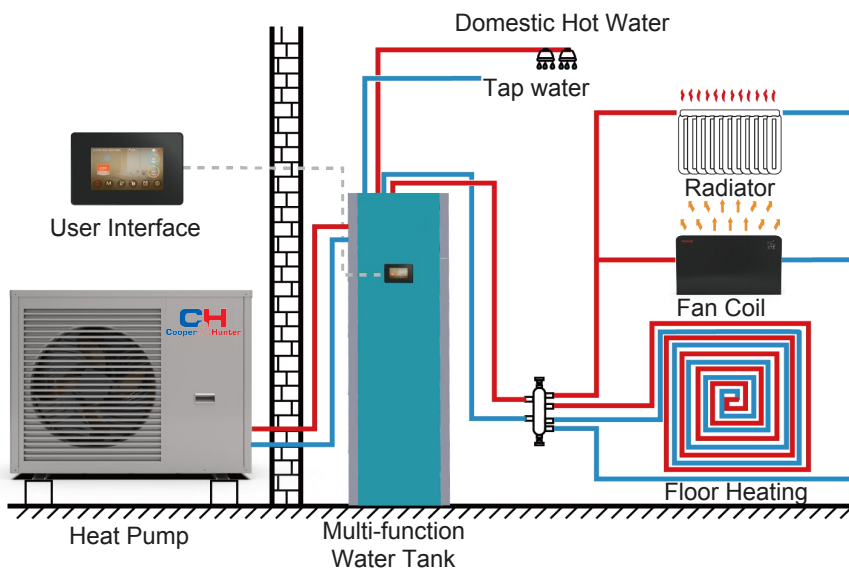
5.2 Installation with Hydronic Box

Provides the monoblock heat pump (without circulation pump) and the Hydronic box. Hydronic box includes one small size built-in buffer tank, one main circulation water pump, one space heating/cooling circulation water pump, one DHW pump, safety valve, water charge valve and expansion tank, electrical heater. When install the unit, installer should connect the heat pump directly to the Hydronic box while the buffer tank (for space heating/cooling) is considered whether to add or not. Storage water tank is needed for the domestic hot water application. Temperature sensor should be added in the storage water tank.



5.3 Installation with Multi-functions box

Provides the monoblock heat pump (without circulation pump) and the Multi-functions box. Multi-functions box includes one 50-liter buffer tank, one 150-liter storage tank, one main circulation water pump, one space heating/cooling circulation water pump, one domestic hot water pump, safety valve, water charge valve and hot water valve. When install the unit, installer just connect the heat pump directly to the Multi-functions box.

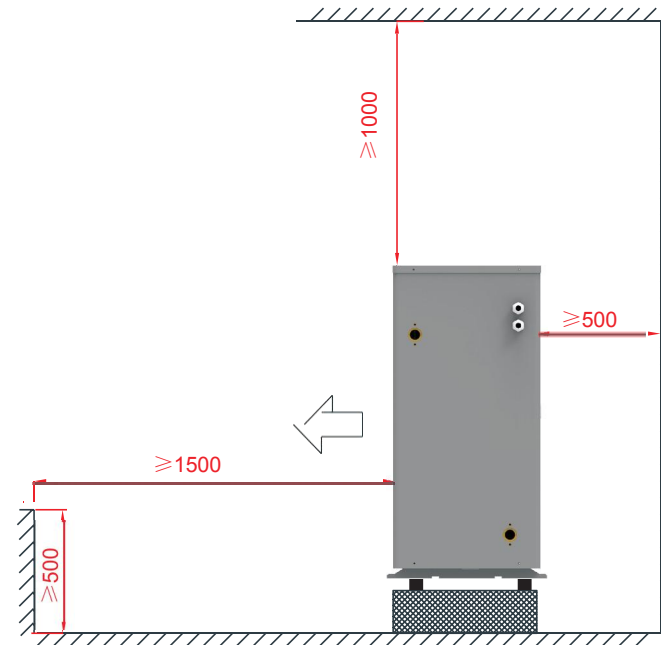
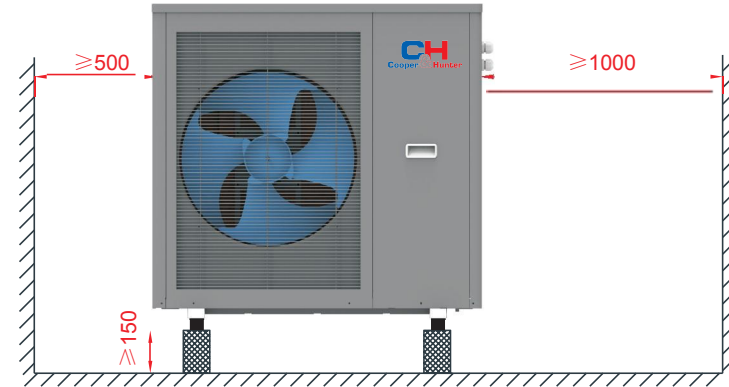


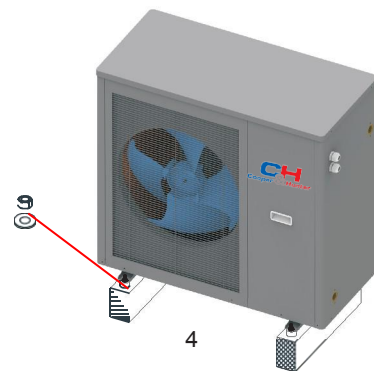
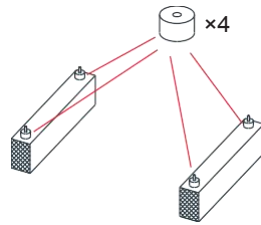
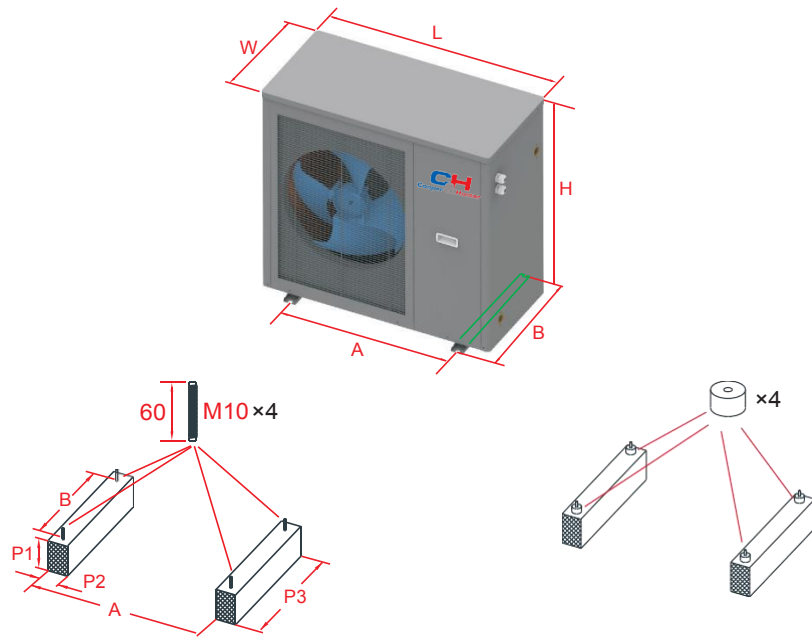
6. Handling & Installation

6.1. Packing List

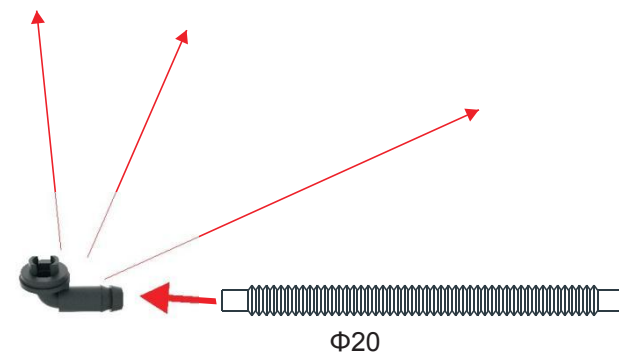
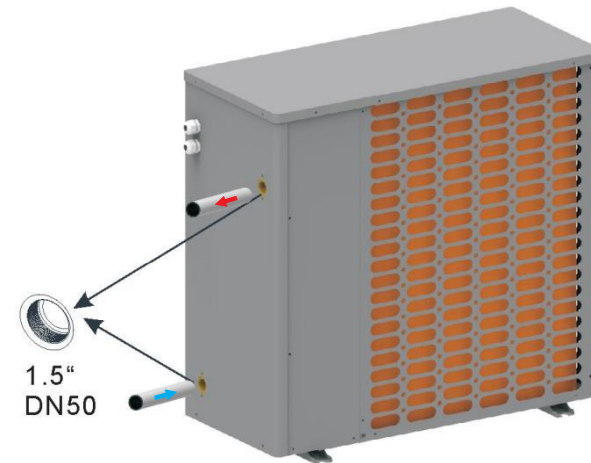
	Heat Pump Unit × 1
	Display Mounting Plate × 1
	Rubber Feet × 4
	Drain Connection × 1
	Display Connecting Wire × 1
	Thermistor × 1 *optional accessory

6.2. Installation Site Requirement (Unit: mm)





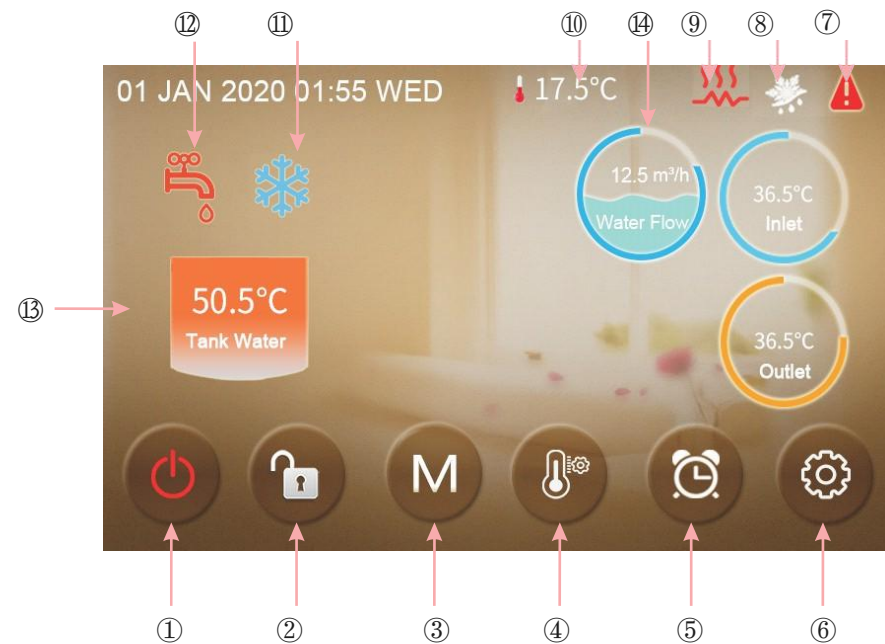
	P6	P10A/P10T	P17A/P17T	P24T
L	750	953	997	1172
H	805	915	1315	1605
W	442	423	395	397
A	750	700	650	725
B	473	443	400	415
P1	200	200	200	200
P2	150	150	150	150
P3	B+100	B+100	B+100	B+100



Nameplate max. current	Phase line	Earth line	MCB	Creepage protector	Signal line
Less than 10A	2×1.5 mm ²	1.5 mm ²	20A	30mA less than 0.1 sec	n×0.5mm ²
10~16A	2×2.5 mm ²	2.5 mm ²	32A	30mA less than 0.1 sec	
16~25A	2×4 mm ²	4 mm ²	40A	30mA less than 0.1 sec	
25~32A	2×6 mm ²	6 mm ²	40A	30mA less than 0.1 sec	
32~40A	2×10 mm ²	10 mm ²	63A	30mA less than 0.1 sec	
40 ~63A	2×16mm ²	16mm ²	80A	30mA less than 0.1 sec	
63~75A	2×25 mm ²	25mm ²	100A	30mA less than 0.1 sec	
75~101A	2×25 mm ²	25mm ²	125A	30mA less than 0.1 sec	
101~123A	2×35 mm ²	35 mm ²	160A	30mA less than 0.1 sec	
123~148A	2×50 mm ²	50 mm ²	225A	30mA less than 0.1 sec	
148~186A	2×70 mm ²	70 mm ²	250A	30mA less than 0.1 sec	
186~224A	2×95 mm ²	95 mm ²	280A	30mA less than 0.1 sec	

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
Less than 10A	3×1.5 mm ²	1.5mm ²	20A	30mA less than 0.1 sec	n×0.5mm ²
10~16A	3×2.5 mm ²	2.5mm ²	32A	30mA less than 0.1 sec	
16~25A	3×4 mm ²	4mm ²	40A	30mA less than 0.1 sec	
25~32A	3×6 mm ²	6mm ²	40A	30mA less than 0.1 sec	
32~40A	3×10 mm ²	10mm ²	63A	30mA less than 0.1 sec	
40 ~63A	3×16mm ²	16mm ²	80A	30mA less than 0.1 sec	
63~75A	3×25mm ²	25mm ²	100A	30mA less than 0.1 sec	
75~101A	3×25 mm ²	25mm ²	125A	30mA less than 0.1 sec	
101~123A	3×35 mm ²	35mm ²	160A	30mA less than 0.1 sec	
123~148A	3×50 mm ²	50mm ²	225A	30mA less than 0.1 sec	
148~186A	3×70 mm ²	70mm ²	250A	30mA less than 0.1 sec	
186~224A	3×95 mm ²	95mm ²	280A	30mA less than 0.1 sec	

If the unit is installed outdoor, please use the cable which can against UV.



Key No.	Key Name	Key Function
①	ON/OFF	Switch the unit ON or OFF. Red represents ON, while gray represents OFF.
②	Lock Screen	Lock the screen. White represents disabled, while green represents enabled.
③	Running Mode	Switch to Hot water mode, heating mode, cooling mode, hot water + heating mode or hot water + cooling mode
④	Temperature Setting	Set the target temperature.
⑤	Timer Setting	Set the timer. White represents disabled, while green represents enabled.
⑥	Setup	Check the unit status, time, factory parameter, temperature curve, timer setting and mute setting.

⑦	Fault	This icon will flash when there is an error showing up. The display will enter fault record interface after tapping this icon.
⑧	Defrosting	The unit is in defrosting mode when this icon shows up.
⑨	Electric Heater	The unit is in electric heater mode when this icon shows up.
⑩	Ambient Temperature	It shows the current ambient temperature.
⑪	Cooling Mode	The unit is in cooling mode when this icon shows up.
⑫	Hot Water Mode	The unit is in hot water mode when this icon shows up.
⑬	Tank Water Temperature	The unit is in hot water mode when this icon shows up; Otherwise, this icon is not shown.
⑭	Water Flow	It shows the current water flow (note: When H31=0, the icon is not displayed).

Before starting up the unit for the first time or after a long-time shutdown, the following preparations must be made:

- (1) Thoroughly inspect and clean up the unit.
- (2) Clean the waterway system.
- (3) Check water pump, regulating valve and other waterway equipment.
- (4) Tighten all wire connections.

Do not change the system parameters before consulting the engineer.

Ensure the water refill and exhaust device in the waterway is well, otherwise the performance and reliability of the unit will become worse.

Ensure the waterways are clean and avoid dirt and blockage.

Timely check the electrical, water and replace the faulty parts.

Please use the parts provided or recommended by the company, do not use the parts unqualified.

Refrigerant supplement:

Each unit has been equipped with sufficient refrigerant when leaving the factory. Do not charge or change the refrigerant.

If you need to replenish the refrigerant due to leakage, please contact the engineer or dealer.

7.2. Periodic Maintenance (every 6 months)

Preparation	Before maintenance, please ensure that the unit stop running and cut off the power supply.
Inspection and cleaning of fin heat exchanger	In order to ensure that heat exchangers remain in optimum condition for heat exchange, their surfaces must be kept clean.
Inspection and cleaning of plate heat exchanger	Every 6 months or when the capacity of the unit drops by more than 10%, check the water-side heat exchanger for scale and clean the heat exchanger.
Check the electrical wiring	Check if the contact point is loose, oxidized, or blocked by sundries, etc., which causes poor contact of the electronic wiring.

7.3. Inspection and Maintenance

7.3.1. Preparing for inspection and maintenance

Danger!

Risk of death caused by fire or explosion if there is a refrigerant leakage!

Only carry out the work if you are competent and have knowledge about the special features and risks of R32 refrigerant.

The product contains combustible refrigerant R32. In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

Ensure that space is sufficiently aerated around the product.

Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.

Disconnect the product from the power supply but ensure that the product is still earthed.

7.3.2. Cleaning the product

Do not clean the product with a high-pressure cleaner or a direct jet of water.

Clean the product using a sponge and hot water with a cleaning agent.

Do not use abrasive cleaners. Do not use solvents. Do not use any cleaning agents that contain chlorine or ammonia.

7.3.3. Checking the evaporator, fan, and condensate discharge

Check whether there is dirt between the fins or whether depositions have adhered to the fins.

Clean the fins using a soft brush, avoid fins from being bent.

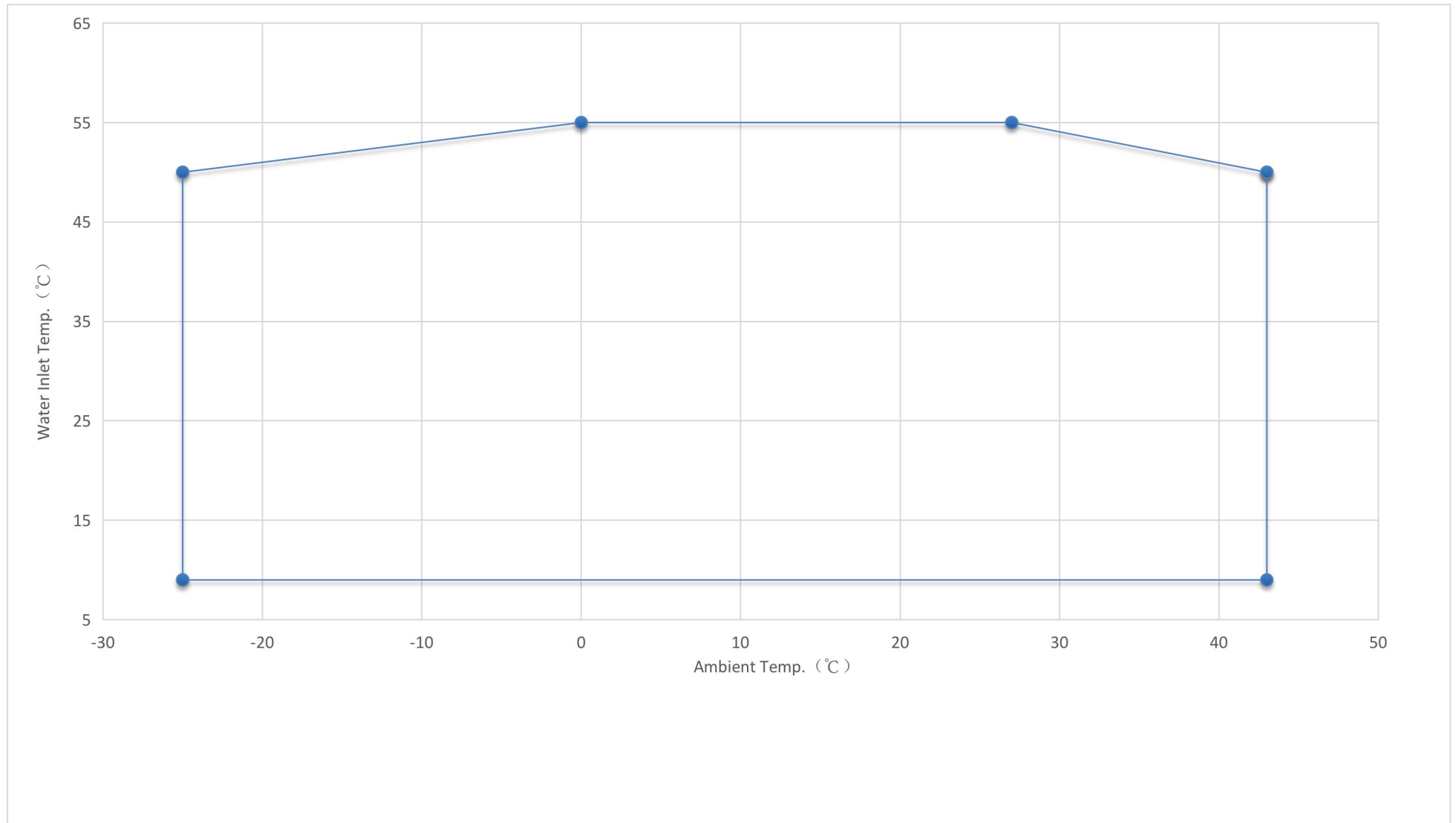
Check whether dirt has accumulated on the condensate tray or in the condensate discharge pipe.

Check that the water can drain freely.

7. Parameters

Model		CH-HP08UIMPRK	CH-HP12UIMPRM	CH-HP20UIMPRM	CH-HP24UIMPRM
Power Supply	/	230V~/30~90Hz	380V/3N~/30~90Hz	380V/3N~/30~90Hz	380V3N~/30~90Hz
Moisture Resistance	IPX	IPX4	IPX4	IPX4	IPX4
Electrical Shockproof	I	I	I	I	I
Heating Condition - Ambient Temp. (DB/WB): 7/6°C, Water Temp. (In/Out): 30/35°C					
Heating Capacity Range	kW	2.29~8.25	4.70~12.50	7.00~20.50	10.00~25.00
Heating Power Input Range	kW	0.63~1.81	1.08~3.44	1.50~6.00	2.80~5.70
Heating Current Input Range	A	3.2~8.0	2.1~5.7	2.5~10.0	4.67~10.17
Cooling Condition - Ambient Temp. (DB/WB): 35/24°C, Water Temp. (In/Out): 12/7°C					
Cooling Capacity Range	kW	1.98~6.10	3.22~11.30	5.50~15.50	6.4~15.80
Cooling Power Input Range	kW	0.70~2.22	1.27~4.64	1.50~6.00	3.4~6.80
Heating Current Input Range	A	3.3~9.7	2.4~7.6	2.5~10.0	6.28~11.6
Hot Water Function is available for all the sizes.					
Max. Power Input	kW	2.9	4.64	7.20	12.50
Max. Current Input	A	13.0	21.5	12.0	20.3
Water Flow	m³/h	1	1.7	2.9	4.2
Refrigerant / Proper Input	kg	R32 / 1.3kg	R32 / 1.7kg	R32 / 2.0kg	R32 / 3.4kg
Equivalent	Ton	0.88	1.08	1.35	2.27
Sound Pressure (1m)	dB(A)	37~54	42~55	44~58	53~59
Unit Dimension(L/W/H)	mm	1002×490×805	953×460×915	953×437×1315	1178×450×1605
Shipping Dimension(L/W/H)	mm	1070×510×970	1050×500×1060	1050×450×1470	1220×500×1780
Compressor	Brand	Panasonic	Panasonic	Panasonic	Panasonic
Circulation Pump	Brand	GRUNDFOS	GRUNDFOS	GRUNDFOS	GRUNDFOS
Operating Ambient Temperature	°C	-25~43	-25~43	-25~43	-25~43
Fan Quantity	/	1	1	1	2
Fan Motor Type	/	DC motor	DC motor	DC motor	DC motor
Fan Motor Power Input (Min~Max)	W	30~75	30~93	30~73	60~150
Fan Speed (RPM)	RPM	300~850	300~800	300~800	300~800
Connection (Inch)	Inch	1	1	1	1 1/4
Water Pressure Drop (max)	kPa	28	35	35	68
Circulation Pump Water Head	m	5.5	5.5	12.5	21

9. Operation Range



CH-HP08UIMPRK 30Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		1.47	1.70	1.81	2.04	2.15	2.26	2.43	2.66	2.83	2.91	3.08	3.25	3.42	3.59	3.79
41		1.43	1.65	1.76	1.98	2.09	2.19	2.36	2.58	2.74	2.82	2.99	3.15	3.31	3.48	3.68
45		1.38	1.60	1.70	1.91	2.02	2.13	2.29	2.50	2.66	2.73	2.89	3.05	3.21	3.37	3.56
50		1.35	1.56	1.67	1.87	1.98	2.08	2.24	2.45	2.60	2.68	2.83	2.99	3.14	3.30	3.49
55		1.31	1.51	1.61	1.81	1.91	2.01	2.16	2.37	2.52	2.59	2.74	2.89	3.04	3.19	3.37
60		1.28	1.48	1.57	1.77	1.87	1.97	2.12	2.31	2.46	2.53	2.68	2.83	2.97	3.12	3.30

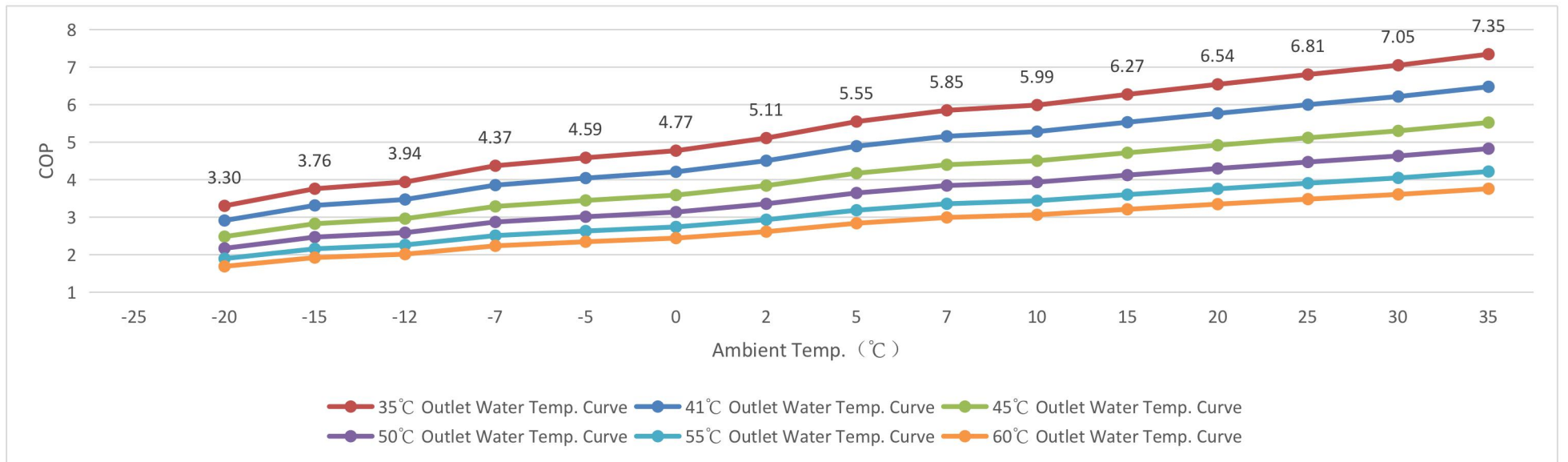
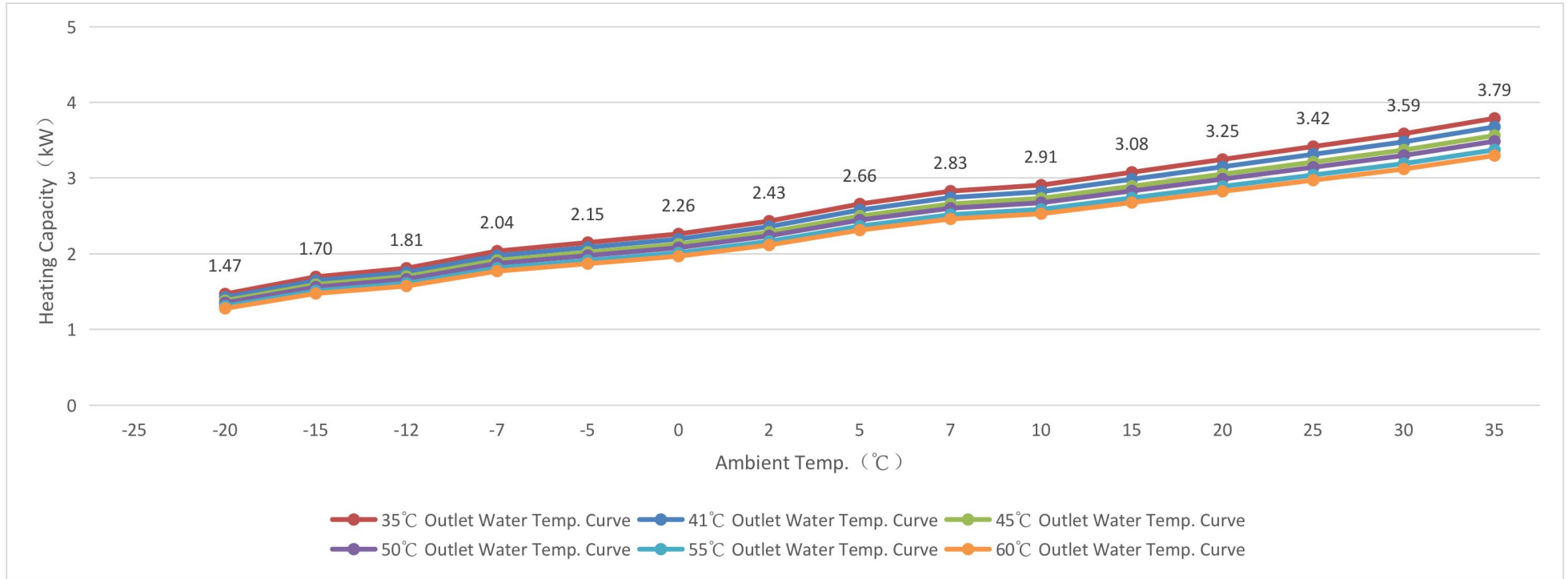
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		0.45	0.45	0.46	0.47	0.47	0.47	0.48	0.48	0.48	0.49	0.49	0.50	0.50	0.51	0.52
41		0.49	0.50	0.51	0.51	0.52	0.52	0.52	0.53	0.53	0.53	0.54	0.55	0.55	0.56	0.57
45		0.56	0.56	0.57	0.58	0.59	0.59	0.59	0.60	0.60	0.61	0.61	0.62	0.63	0.64	0.64
50		0.62	0.63	0.64	0.65	0.66	0.66	0.67	0.67	0.68	0.68	0.69	0.69	0.70	0.71	0.72
55		0.69	0.70	0.71	0.72	0.73	0.73	0.74	0.74	0.75	0.75	0.76	0.77	0.78	0.79	0.80
60		0.76	0.77	0.78	0.79	0.80	0.81	0.81	0.81	0.82	0.83	0.83	0.84	0.85	0.86	0.88

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		3.30	3.76	3.94	4.37	4.59	4.77	5.11	5.55	5.85	5.99	6.27	6.54	6.81	7.05	7.35
41		2.91	3.32	3.47	3.86	4.04	4.21	4.51	4.89	5.16	5.28	5.53	5.77	6.00	6.22	6.48
45		2.48	2.83	2.96	3.29	3.45	3.59	3.84	4.17	4.40	4.50	4.72	4.92	5.12	5.30	5.52
50		2.17	2.47	2.59	2.87	3.01	3.14	3.36	3.65	3.84	3.94	4.12	4.30	4.47	4.63	4.83
55		1.90	2.16	2.26	2.51	2.63	2.74	2.93	3.19	3.36	3.44	3.60	3.76	3.91	4.05	4.22
60		1.69	1.92	2.02	2.24	2.35	2.44	2.62	2.84	2.99	3.07	3.21	3.35	3.48	3.61	3.76

CH-HP08UIMPRK 30Hz



CH-HP08UIMPRK 57.5Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.41	2.84	3.28	3.50	3.94	4.16	4.37	4.70	5.14	5.47	5.62	5.95	6.28	6.61	6.45	6.82
41	2.33	2.76	3.18	3.39	3.82	4.03	4.24	4.56	4.99	5.30	5.45	5.77	6.09	6.41	6.26	6.62
45	2.26	2.67	3.08	3.29	3.70	3.91	4.11	4.42	4.83	5.14	5.28	5.59	5.90	6.21	6.06	6.41
50	2.21	2.62	3.02	3.22	3.62	3.82	4.02	4.33	4.73	5.03	5.17	5.47	5.78	6.08	5.93	6.27
55		2.53	2.92	3.11	3.50	3.70	3.89	4.19	4.58	4.87	5.00	5.30	5.59	5.88	5.74	6.07
60		2.47	2.85	3.04	3.43	3.62	3.81	4.09	4.47	4.76	4.89	5.18	5.46	5.75	5.61	5.93

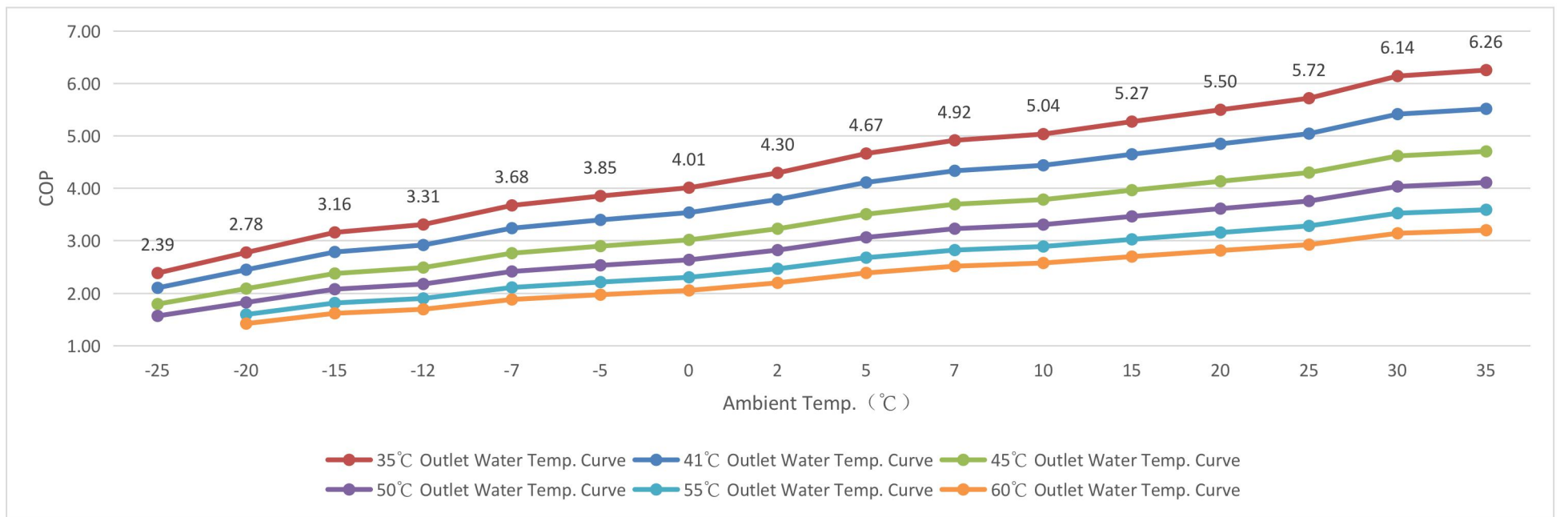
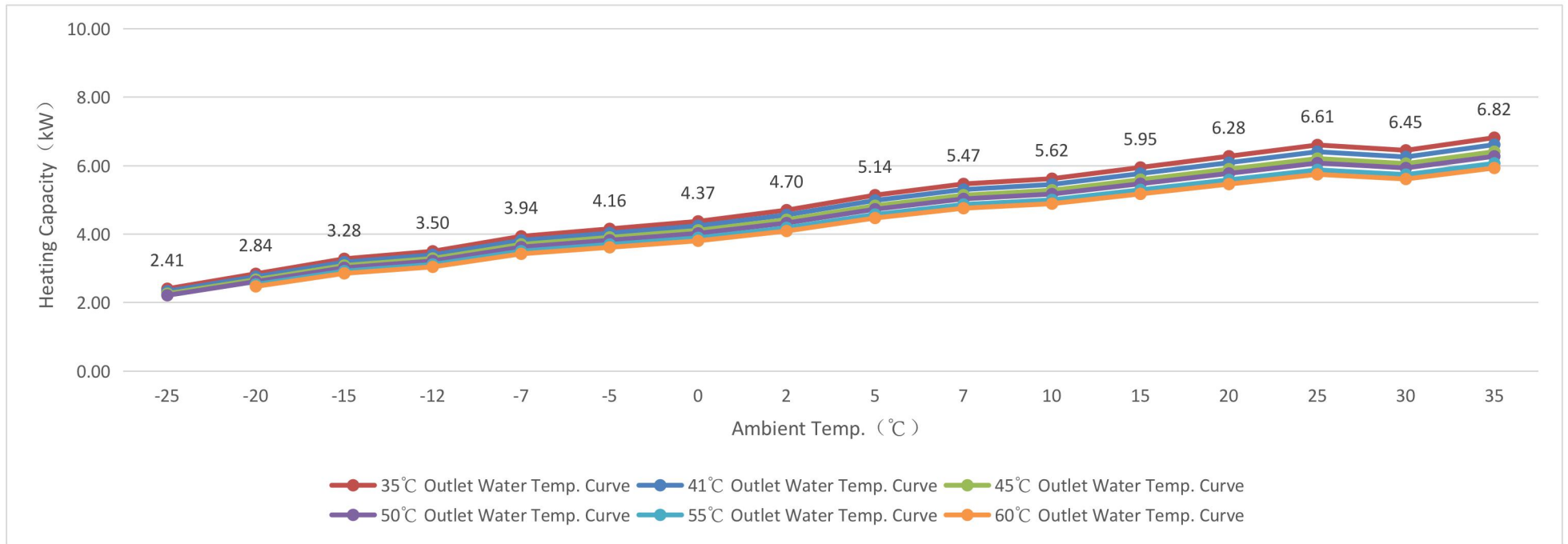
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.01	1.02	1.04	1.06	1.07	1.08	1.09	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.05	1.09
41	1.11	1.13	1.14	1.16	1.18	1.19	1.20	1.20	1.21	1.22	1.23	1.24	1.26	1.27	1.16	1.20
45	1.26	1.28	1.30	1.32	1.34	1.35	1.36	1.37	1.38	1.39	1.40	1.41	1.43	1.44	1.31	1.36
50	1.41	1.43	1.45	1.48	1.50	1.51	1.53	1.53	1.54	1.56	1.56	1.58	1.60	1.62	1.47	1.53
55		1.59	1.61	1.64	1.66	1.67	1.69	1.70	1.71	1.72	1.73	1.75	1.77	1.79	1.63	1.69
60		1.74	1.76	1.80	1.82	1.83	1.85	1.86	1.87	1.89	1.90	1.92	1.94	1.96	1.79	1.85

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.39	2.78	3.16	3.31	3.68	3.85	4.01	4.30	4.67	4.92	5.04	5.27	5.50	5.72	6.14	6.26
41	2.10	2.45	2.79	2.92	3.24	3.40	3.54	3.79	4.11	4.34	4.44	4.65	4.85	5.04	5.42	5.52
45	1.79	2.09	2.38	2.49	2.76	2.90	3.02	3.23	3.51	3.70	3.79	3.97	4.14	4.30	4.62	4.71
50	1.57	1.82	2.08	2.18	2.42	2.53	2.64	2.82	3.07	3.23	3.31	3.47	3.61	3.76	4.04	4.11
55		1.59	1.81	1.90	2.11	2.21	2.30	2.47	2.68	2.82	2.89	3.03	3.16	3.28	3.53	3.59
60		1.42	1.62	1.69	1.88	1.97	2.05	2.20	2.39	2.52	2.58	2.70	2.81	2.93	3.14	3.20

CH-HP08UIMPRK 57.5Hz



CH-HP08UIMPRK 80Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	3.23	3.82	4.40	4.58	5.15	5.44	5.28	5.68	6.21	6.60	6.79	6.59	6.95	6.65	6.45	6.82
41	3.14	3.71	4.28	4.44	5.00	5.28	5.13	5.51	6.02	6.40	6.59	6.39	6.74	6.45	6.26	6.62
45	3.04	3.60	4.15	4.31	4.84	5.11	4.97	5.34	5.84	6.20	6.38	6.19	6.53	6.25	6.06	6.41
50	2.96	3.49	4.03	4.21	4.74	5.00	4.86	5.23	5.71	6.07	6.25	6.06	6.40	6.12	5.93	6.27
55		3.35	3.85	4.08	4.58	4.84	4.70	5.06	5.53	5.87	6.04	5.86	6.19	5.92	5.74	6.07
60		2.75	3.34	3.68	4.13	4.37	4.60	4.94	5.40	5.74	5.91	5.73	6.05	5.79	5.61	5.93

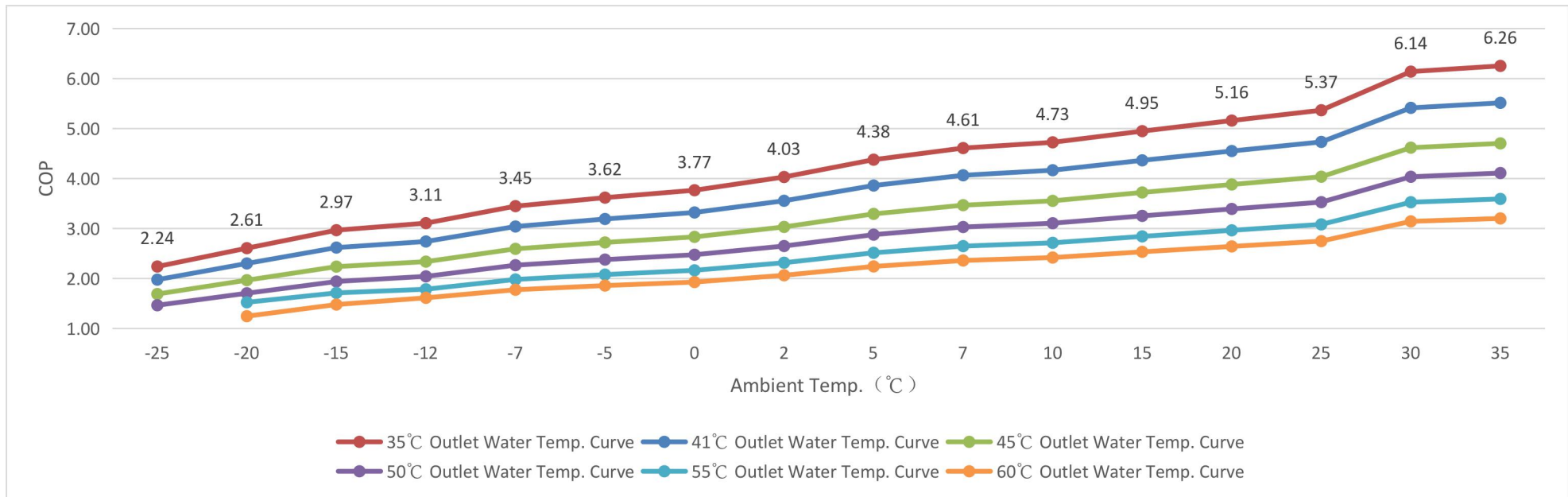
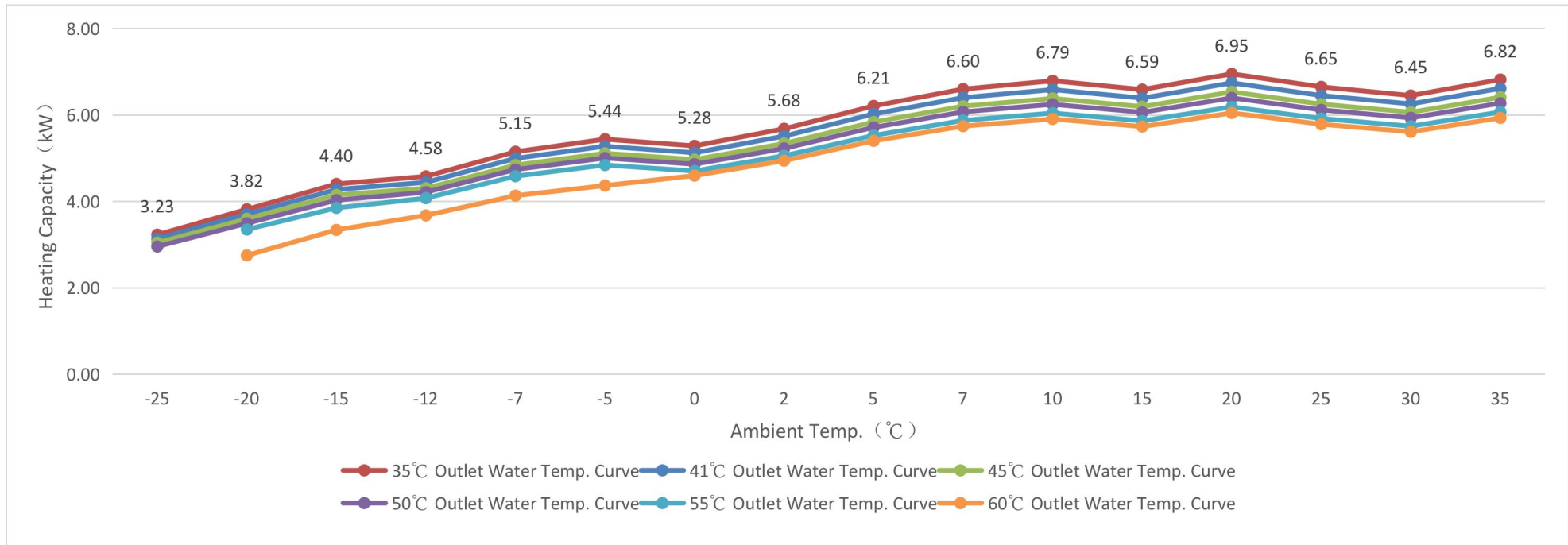
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.44	1.46	1.48	1.47	1.49	1.50	1.40	1.41	1.42	1.43	1.44	1.33	1.35	1.24	1.05	1.09
41	1.59	1.61	1.63	1.62	1.64	1.65	1.54	1.55	1.56	1.57	1.58	1.46	1.48	1.36	1.16	1.20
45	1.80	1.83	1.86	1.84	1.87	1.88	1.75	1.76	1.77	1.79	1.80	1.66	1.68	1.55	1.31	1.36
50	2.02	2.05	2.08	2.06	2.09	2.10	1.96	1.97	1.99	2.00	2.01	1.86	1.89	1.73	1.47	1.53
55		2.20	2.25	2.28	2.31	2.33	2.17	2.18	2.20	2.22	2.23	2.06	2.09	1.92	1.63	1.69
60		2.21	2.26	2.28	2.33	2.35	2.38	2.40	2.41	2.43	2.44	2.26	2.29	2.11	1.79	1.85

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.24	2.61	2.97	3.11	3.45	3.62	3.77	4.03	4.38	4.61	4.73	4.95	5.16	5.37	6.14	6.26
41	1.98	2.30	2.62	2.74	3.04	3.19	3.32	3.56	3.86	4.07	4.17	4.37	4.55	4.73	5.42	5.52
45	1.69	1.97	2.24	2.34	2.59	2.72	2.83	3.03	3.29	3.47	3.55	3.72	3.88	4.04	4.62	4.71
50	1.46	1.70	1.94	2.04	2.27	2.38	2.48	2.65	2.88	3.03	3.11	3.25	3.39	3.53	4.04	4.11
55		1.52	1.71	1.78	1.98	2.08	2.16	2.32	2.51	2.65	2.71	2.84	2.96	3.08	3.53	3.59
60		1.24	1.48	1.61	1.77	1.86	1.93	2.06	2.24	2.36	2.42	2.53	2.64	2.75	3.14	3.20

CH-HP08UIMPRK 80Hz



CH-HP08UIMPRK 90Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	3.63	4.01	4.62	4.58	5.15	5.44	5.28	5.68	6.21	6.60	6.79	6.59	6.95	6.65	6.45	6.82
41	3.53	3.89	4.49	4.44	5.00	5.28	5.13	5.51	6.02	6.40	6.59	6.39	6.74	6.45	6.26	6.62
45	3.43	3.77	4.35	4.31	4.84	5.11	4.97	5.34	5.84	6.20	6.38	6.19	6.53	6.25	6.06	6.41
50	3.27	3.69	4.25	4.21	4.74	5.00	4.86	5.23	5.71	6.07	6.25	6.06	6.40	6.12	5.93	6.27
55		3.35	3.85	4.08	4.58	4.84	4.70	5.06	5.53	5.87	6.04	5.86	6.19	5.92	5.74	6.07
60		2.75	3.34	3.68	4.13	4.37	4.60	4.94	5.40	5.74	5.91	5.73	6.05	5.79	5.61	5.93

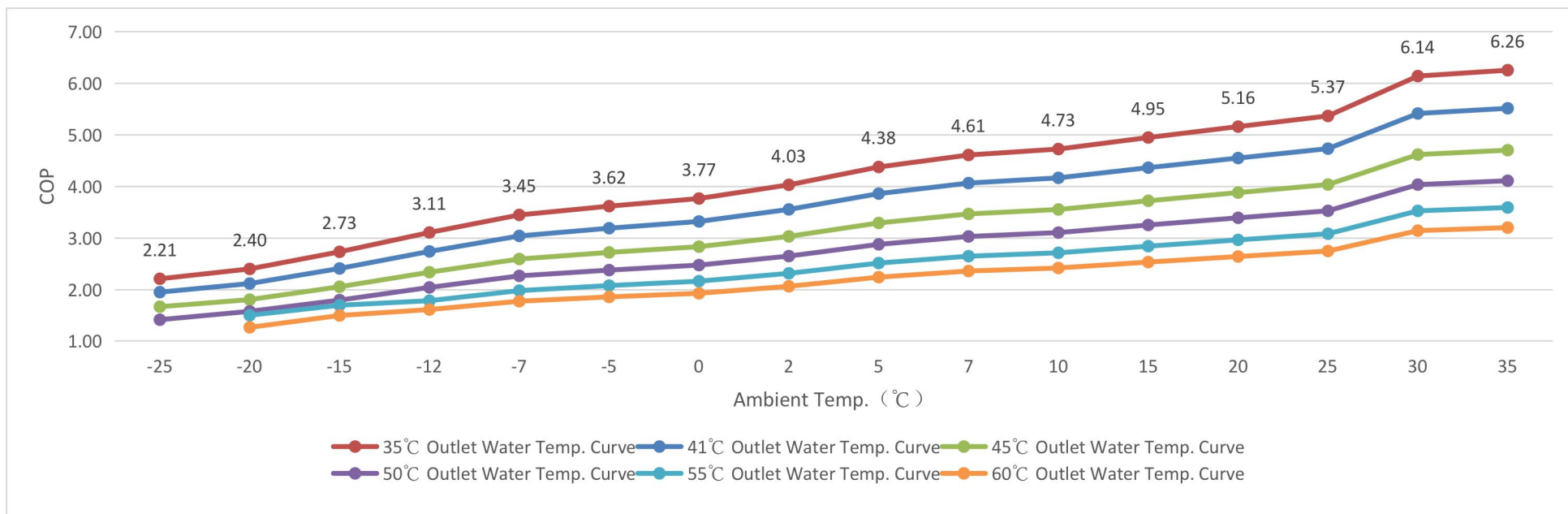
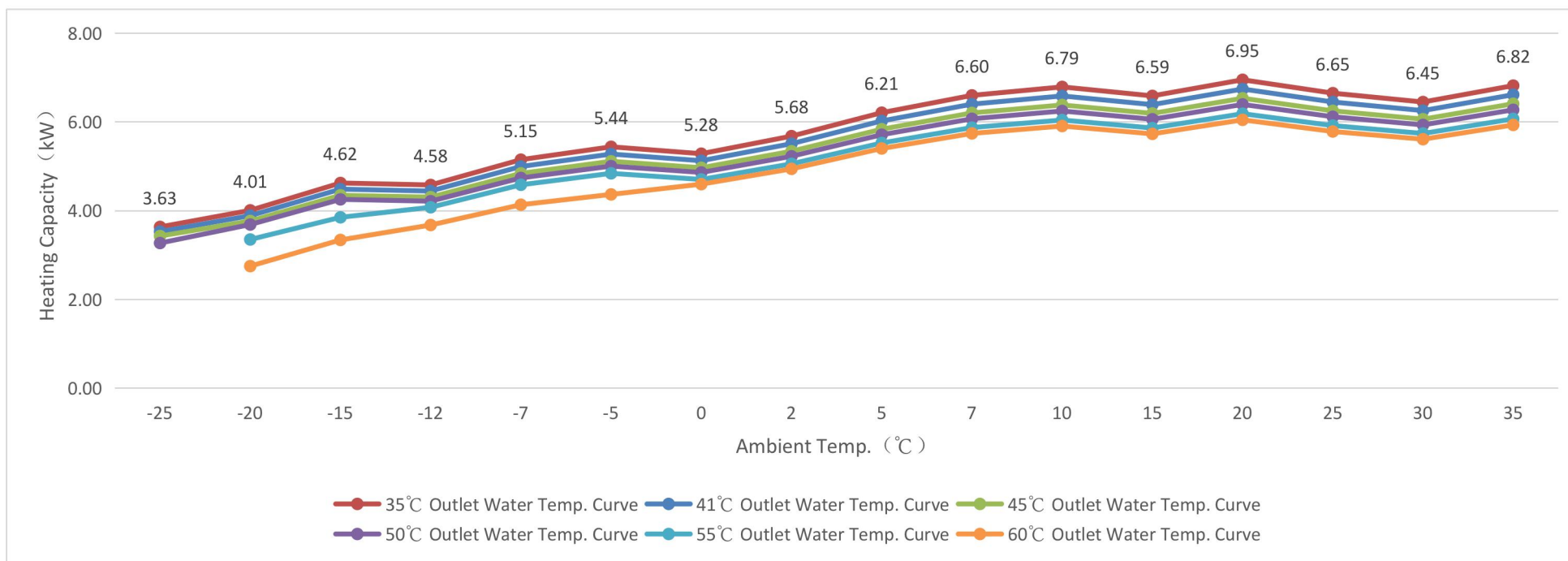
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.64	1.67	1.69	1.47	1.49	1.50	1.40	1.41	1.42	1.43	1.44	1.33	1.35	1.24	1.05	1.09
41	1.81	1.84	1.86	1.62	1.64	1.65	1.54	1.55	1.56	1.57	1.58	1.46	1.48	1.36	1.16	1.20
45	2.06	2.09	2.12	1.84	1.87	1.88	1.75	1.76	1.77	1.79	1.80	1.66	1.68	1.55	1.31	1.36
50	2.31	2.34	2.37	2.06	2.09	2.10	1.96	1.97	1.99	2.00	2.01	1.86	1.89	1.73	1.47	1.53
55		2.23	2.27	2.28	2.31	2.33	2.17	2.18	2.20	2.22	2.23	2.06	2.09	1.92	1.63	1.69
60		2.17	2.23	2.28	2.33	2.35	2.38	2.40	2.41	2.43	2.44	2.26	2.29	2.11	1.79	1.85

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.21	2.40	2.73	3.11	3.45	3.62	3.77	4.03	4.38	4.61	4.73	4.95	5.16	5.37	6.14	6.26
41	1.95	2.12	2.41	2.74	3.04	3.19	3.32	3.56	3.86	4.07	4.17	4.37	4.55	4.73	5.42	5.52
45	1.67	1.81	2.06	2.34	2.59	2.72	2.83	3.03	3.29	3.47	3.55	3.72	3.88	4.04	4.62	4.71
50	1.42	1.58	1.80	2.04	2.27	2.38	2.48	2.65	2.88	3.03	3.11	3.25	3.39	3.53	4.04	4.11
55		1.50	1.70	1.78	1.98	2.08	2.16	2.32	2.51	2.65	2.71	2.84	2.96	3.08	3.53	3.59
60		1.27	1.50	1.61	1.77	1.86	1.93	2.06	2.24	2.36	2.42	2.53	2.64	2.75	3.14	3.20

CH-HP08UIMPRK 90Hz



CH-HP12UIMPRM 30HZ

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		2.35	2.65	2.85	3.08	3.25	3.55	3.82	4.33	4.70	5.40	5.95	6.33	6.82	7.26	7.63
41		2.28	2.57	2.76	2.99	3.15	3.44	3.71	4.20	4.56	5.24	5.77	6.14	6.62	7.04	7.40
45		2.21	2.49	2.68	2.90	3.06	3.34	3.59	4.07	4.42	5.08	5.59	5.95	6.41	6.82	7.17
50		2.16	2.44	2.62	2.83	2.99	3.27	3.51	3.98	4.32	4.97	5.47	5.82	6.27	6.68	7.02
55		2.09	2.36	2.54	2.74	2.89	3.16	3.40	3.85	4.18	4.81	5.30	5.63	6.07	6.46	6.79
60		2.04	2.31	2.48	2.68	2.83	3.09	3.32	3.77	4.09	4.70	5.18	5.51	5.93	6.32	6.64

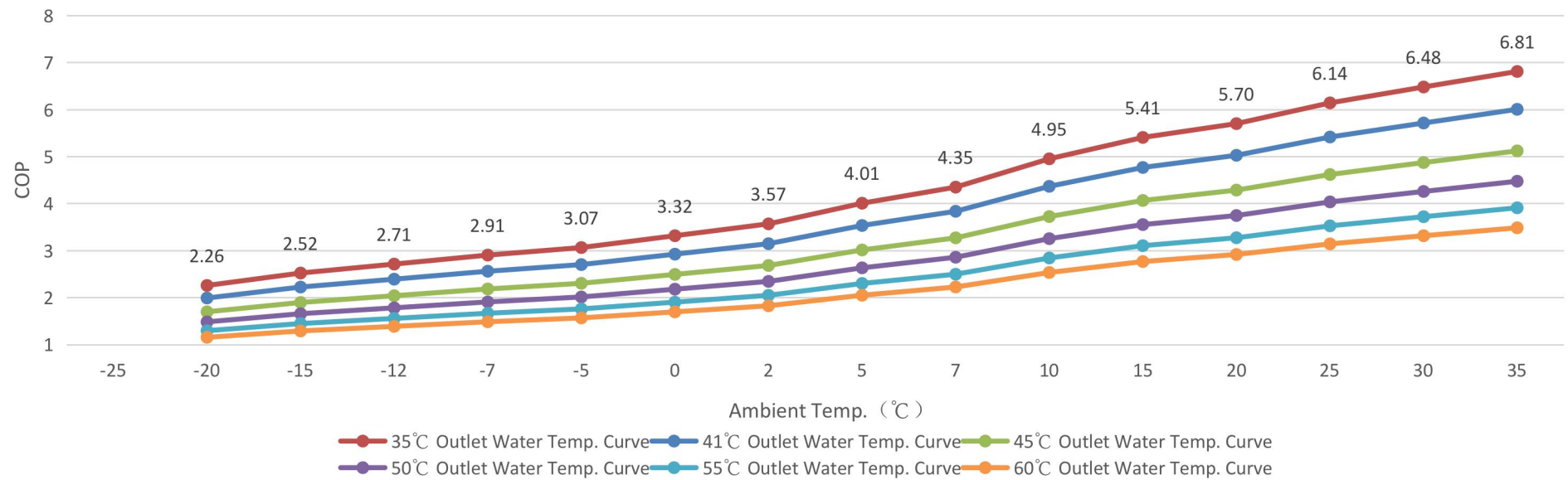
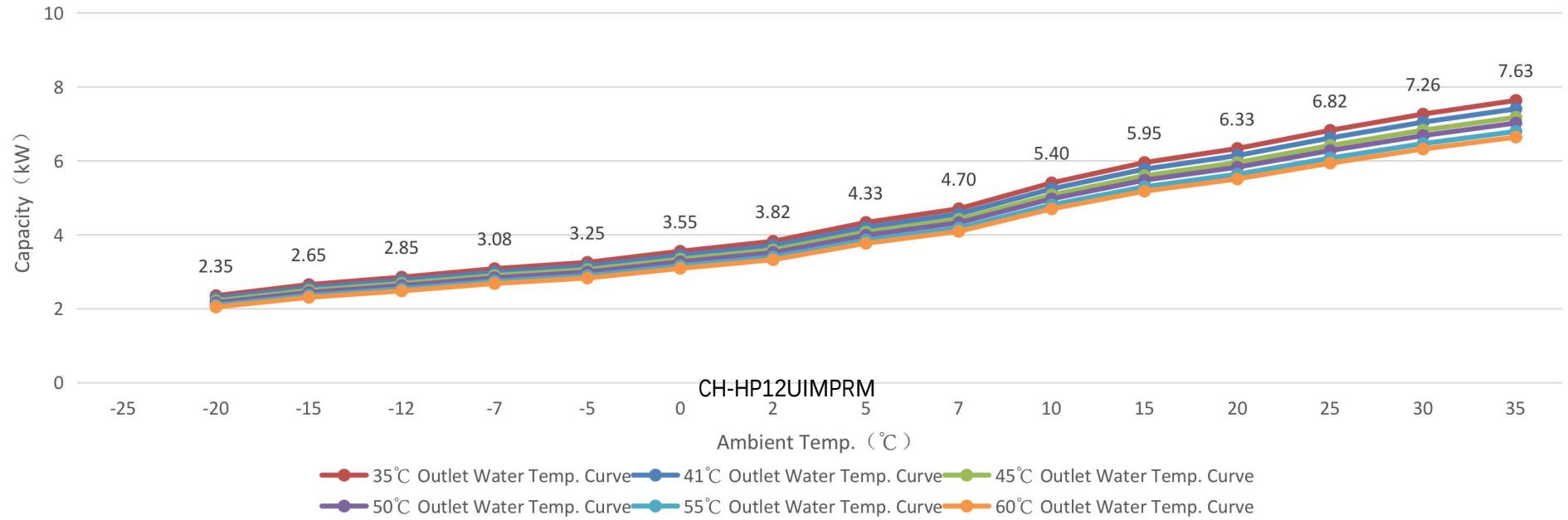
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		1.04	1.05	1.05	1.06	1.06	1.07	1.07	1.08	1.08	1.09	1.10	1.11	1.11	1.12	1.12
41		1.14	1.16	1.16	1.17	1.17	1.18	1.18	1.19	1.19	1.20	1.21	1.22	1.22	1.23	1.23
45		1.30	1.31	1.31	1.33	1.33	1.34	1.34	1.35	1.35	1.36	1.38	1.39	1.39	1.40	1.40
50		1.46	1.47	1.47	1.48	1.48	1.50	1.50	1.51	1.51	1.53	1.54	1.55	1.55	1.57	1.57
55		1.61	1.63	1.63	1.64	1.64	1.66	1.66	1.67	1.67	1.69	1.71	1.72	1.72	1.74	1.74
60		1.77	1.79	1.79	1.80	1.80	1.82	1.82	1.84	1.84	1.85	1.87	1.89	1.89	1.90	1.90

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		2.26	2.52	2.71	2.91	3.07	3.32	3.57	4.01	4.35	4.95	5.41	5.70	6.14	6.48	6.81
41		1.99	2.23	2.39	2.56	2.70	2.93	3.15	3.54	3.84	4.37	4.77	5.03	5.42	5.72	6.01
45		1.70	1.90	2.04	2.19	2.31	2.49	2.68	3.01	3.27	3.73	4.07	4.29	4.62	4.87	5.12
50		1.48	1.66	1.78	1.91	2.01	2.18	2.35	2.63	2.86	3.26	3.55	3.75	4.04	4.26	4.48
55		1.30	1.45	1.56	1.67	1.76	1.91	2.05	2.30	2.50	2.84	3.11	3.27	3.53	3.72	3.91
60		1.16	1.29	1.39	1.49	1.57	1.70	1.83	2.05	2.23	2.54	2.77	2.92	3.14	3.32	3.49

CH-HP12UIMPRM 30HZ



CH-HP12UIMPRM **57.5Hz**

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	3.53	3.90	4.27	4.78	5.38	5.93	6.92	7.70	8.37	9.00	9.46	9.75	10.35	10.88	11.35	11.52
41	3.43	3.78	4.14	4.64	5.22	5.76	6.71	7.47	8.12	8.73	9.18	9.46	10.04	10.55	11.01	11.17
45	3.32	3.67	4.01	4.50	5.06	5.58	6.50	7.24	7.87	8.46	8.89	9.17	9.73	10.23	10.67	10.83
50	3.25	3.59	3.93	4.40	4.95	5.46	6.36	7.09	7.70	8.28	8.70	8.97	9.52	10.01	10.44	10.60
55	3.15	3.47	3.80	4.26	4.79	5.28	6.16	6.85	7.45	8.01	8.42	8.68	9.21	9.68	10.10	10.25
60		3.39	3.71	4.16	4.68	5.16	6.02	6.70	7.28	7.83	8.23	8.48	9.00	9.47	9.87	10.02

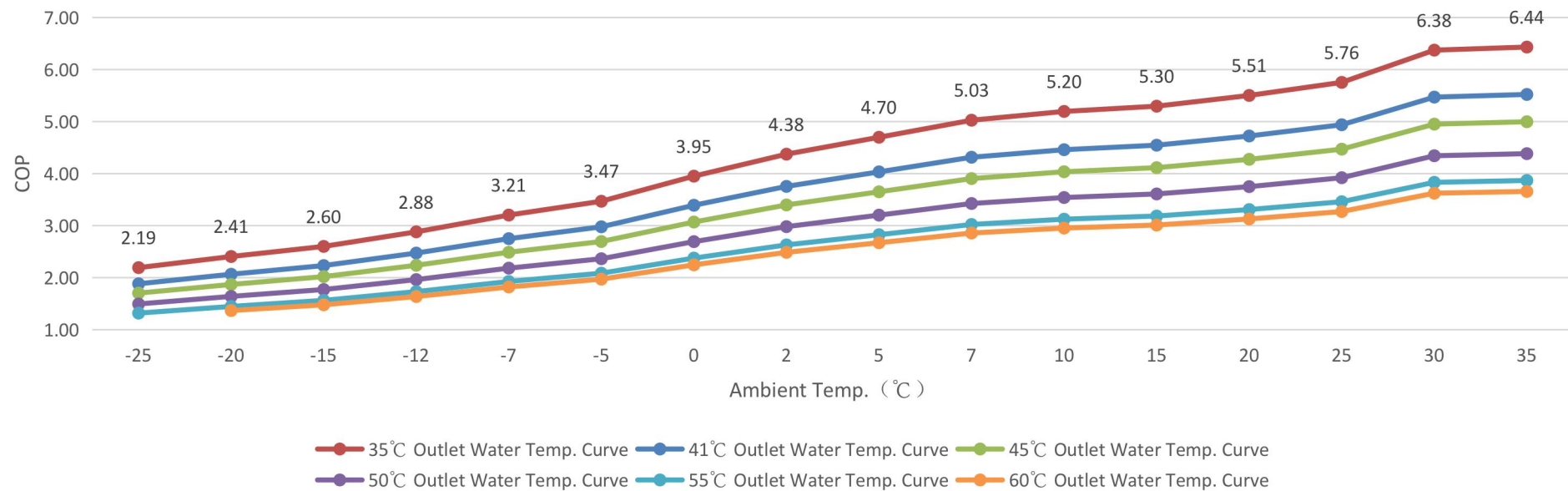
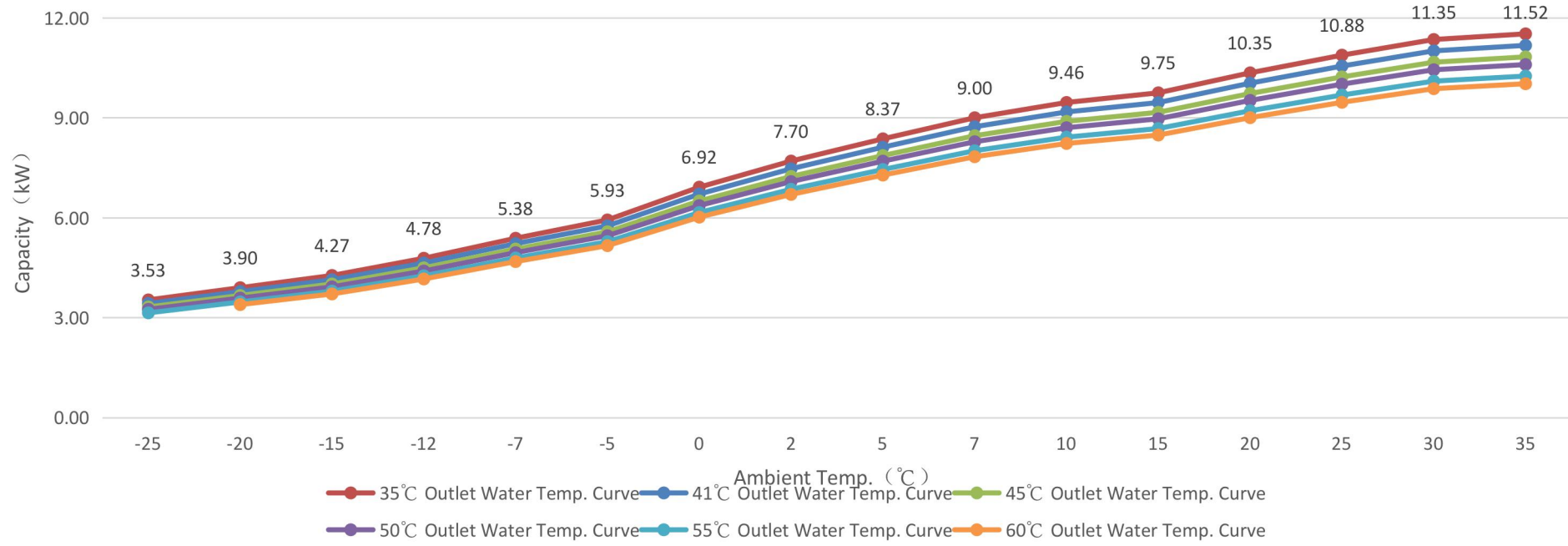
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.61	1.62	1.64	1.66	1.68	1.71	1.75	1.76	1.78	1.79	1.82	1.84	1.88	1.89	1.78	1.79
41	1.82	1.83	1.85	1.88	1.90	1.93	1.98	1.99	2.01	2.02	2.06	2.08	2.12	2.14	2.01	2.02
45	1.95	1.96	1.98	2.01	2.03	2.07	2.12	2.13	2.15	2.17	2.20	2.23	2.27	2.29	2.15	2.17
50	2.17	2.19	2.21	2.24	2.27	2.31	2.36	2.38	2.40	2.42	2.46	2.48	2.54	2.55	2.40	2.42
55	2.38	2.40	2.43	2.46	2.49	2.53	2.59	2.60	2.63	2.65	2.69	2.72	2.78	2.80	2.63	2.65
60		2.48	2.51	2.54	2.57	2.62	2.68	2.69	2.72	2.74	2.78	2.82	2.88	2.89	2.72	2.74

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.19	2.41	2.60	2.88	3.21	3.47	3.95	4.38	4.70	5.03	5.20	5.30	5.51	5.76	6.38	6.44
41	1.88	2.07	2.23	2.47	2.75	2.98	3.39	3.76	4.04	4.32	4.46	4.55	4.73	4.94	5.47	5.52
45	1.70	1.87	2.02	2.24	2.49	2.70	3.07	3.40	3.65	3.91	4.04	4.12	4.28	4.47	4.95	5.00
50	1.50	1.64	1.77	1.96	2.18	2.37	2.69	2.98	3.20	3.43	3.54	3.61	3.75	3.92	4.35	4.39
55	1.32	1.45	1.56	1.73	1.93	2.09	2.38	2.63	2.83	3.02	3.13	3.19	3.31	3.46	3.83	3.87
60		1.37	1.48	1.64	1.82	1.97	2.25	2.49	2.67	2.86	2.96	3.01	3.13	3.27	3.63	3.66

CH-HP12UIMPRM 57.5Hz



CH-HP12UIMPRM 80Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	5.57	6.15	6.92	7.00	7.41	7.63	7.82	8.55	9.27	10.02	10.35	10.16	10.58	10.33	10.35	10.52
41	5.41	5.97	6.72	6.79	7.19	7.40	7.59	8.29	8.99	9.72	10.04	9.86	10.26	10.02	10.04	10.20
45	5.24	5.79	6.51	6.58	6.97	7.17	7.35	8.04	8.71	9.42	9.73	9.55	9.95	9.71	9.73	9.89
50	5.13	5.66	6.37	6.44	6.82	7.02	7.19	7.87	8.53	9.22	9.52	9.35	9.73	9.50	9.52	9.68
55		5.51	5.89	6.23	6.59	6.79	6.96	7.61	8.25	8.92	9.21	9.04	9.42	9.19	9.21	9.36
60		4.23	4.63	5.16	5.71	6.22	6.80	7.44	8.06	8.72	9.00	8.84	9.20	8.99	9.00	9.15

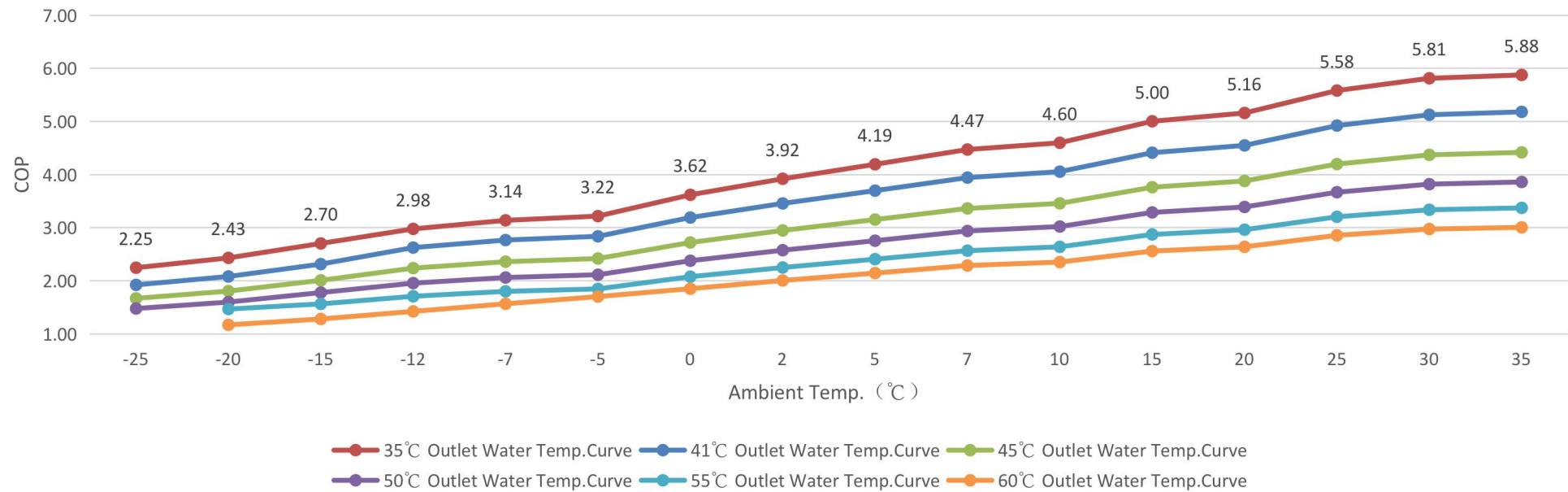
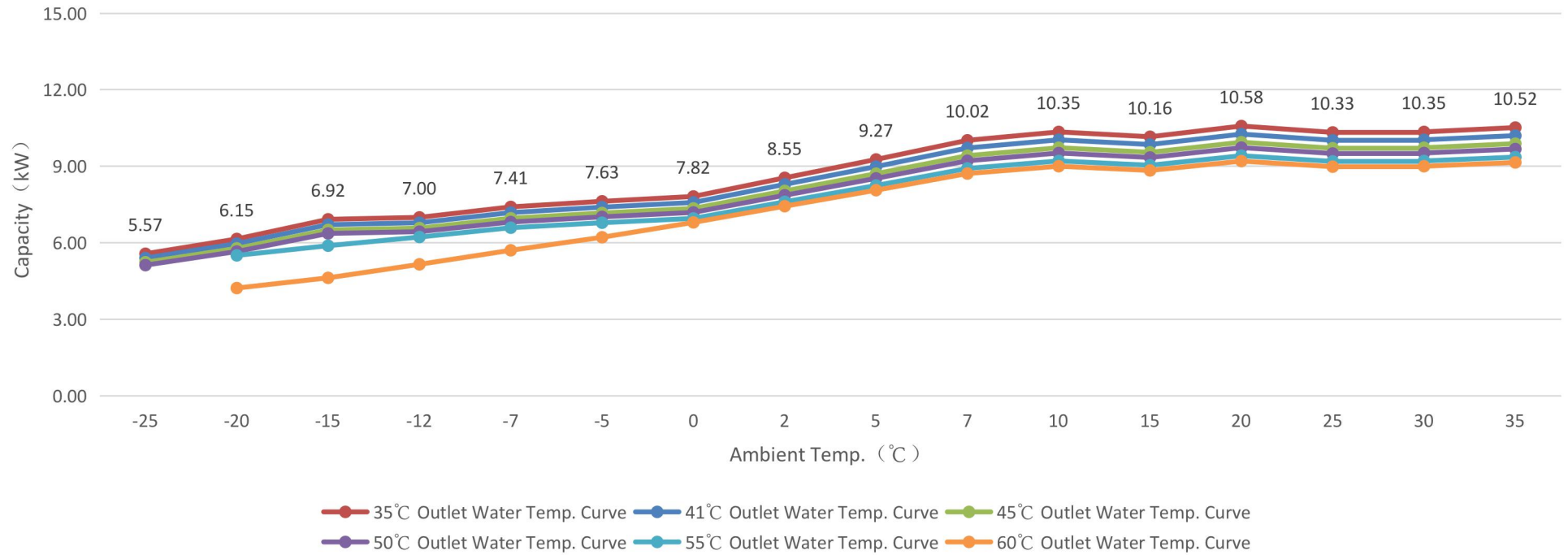
Power Input kw

Outlet Water Temp.	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.48	2.53	2.56	2.35	2.36	2.37	2.16	2.18	2.21	2.24	2.25	2.03	2.05	1.85	1.78	1.79
41	2.81	2.87	2.90	2.59	2.60	2.61	2.38	2.40	2.43	2.46	2.48	2.23	2.26	2.04	1.96	1.97
45	3.14	3.20	3.24	2.94	2.95	2.96	2.70	2.73	2.76	2.80	2.81	2.54	2.56	2.31	2.23	2.24
50	3.47	3.54	3.58	3.29	3.30	3.32	3.02	3.05	3.09	3.14	3.15	2.84	2.87	2.59	2.49	2.51
55		3.75	3.76	3.64	3.66	3.67	3.35	3.38	3.43	3.47	3.49	3.15	3.18	2.87	2.76	2.77
60		3.61	3.61	3.62	3.64	3.65	3.67	3.71	3.76	3.81	3.83	3.45	3.49	3.15	3.03	3.04

COP

Outlet Water Temp.	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.25	2.43	2.70	2.98	3.14	3.22	3.62	3.92	4.19	4.47	4.60	5.00	5.16	5.58	5.81	5.88
41	1.92	2.08	2.32	2.63	2.77	2.84	3.19	3.46	3.70	3.94	4.06	4.41	4.55	4.92	5.13	5.18
45	1.67	1.81	2.01	2.24	2.36	2.42	2.72	2.95	3.15	3.36	3.46	3.76	3.88	4.20	4.37	4.42
50	1.48	1.60	1.78	1.96	2.06	2.12	2.38	2.58	2.76	2.94	3.02	3.29	3.39	3.67	3.82	3.86
55		1.47	1.57	1.71	1.80	1.85	2.08	2.25	2.41	2.57	2.64	2.87	2.96	3.21	3.34	3.37
60		1.17	1.28	1.43	1.57	1.70	1.85	2.01	2.15	2.29	2.35	2.56	2.64	2.86	2.98	3.01

CH-HP12UIMPRM 80Hz



CH-HP12UIMPRM 90Hz

Heating Capacity kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	6.05	6.35	6.83	7.00	7.41	7.63	7.82	8.55	9.27	10.02	10.35	10.16	10.58	10.33	10.35	10.52
41	5.90	6.16	6.63	6.79	7.19	7.40	7.59	8.29	8.99	9.72	10.04	9.86	10.26	10.02	10.04	10.20
45	5.74	5.97	6.42	6.58	6.97	7.17	7.35	8.04	8.71	9.42	9.73	9.55	9.95	9.71	9.73	9.89
50	5.32	5.84	6.28	6.44	6.82	7.02	7.19	7.87	8.53	9.22	9.52	9.35	9.73	9.50	9.52	9.68
55		5.51	5.89	6.23	6.59	6.79	6.96	7.61	8.25	8.92	9.21	9.04	9.42	9.19	9.21	9.36
60		4.23	4.63	5.16	5.71	6.22	6.80	7.44	8.06	8.72	9.00	8.84	9.20	8.99	9.00	9.15

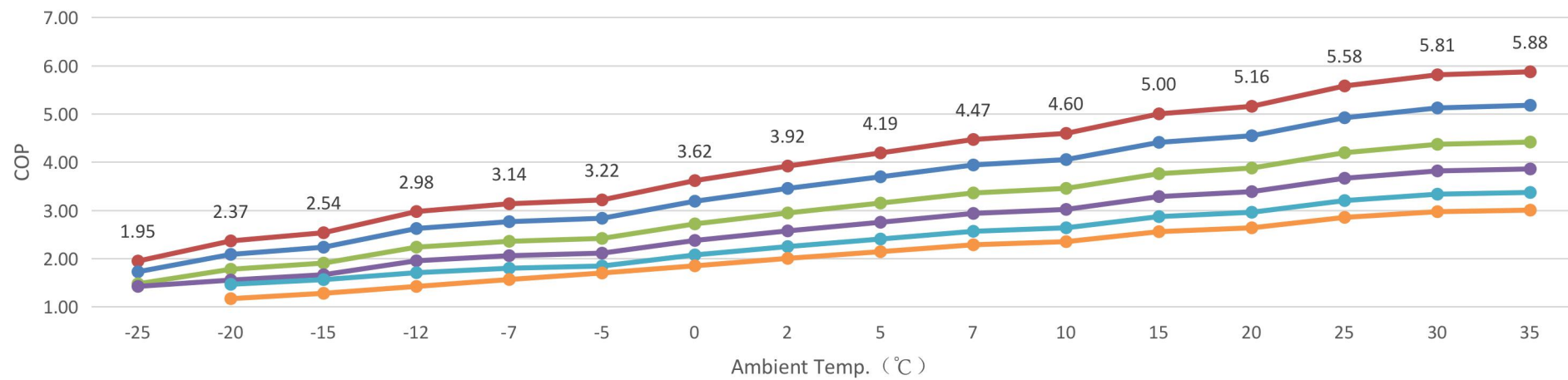
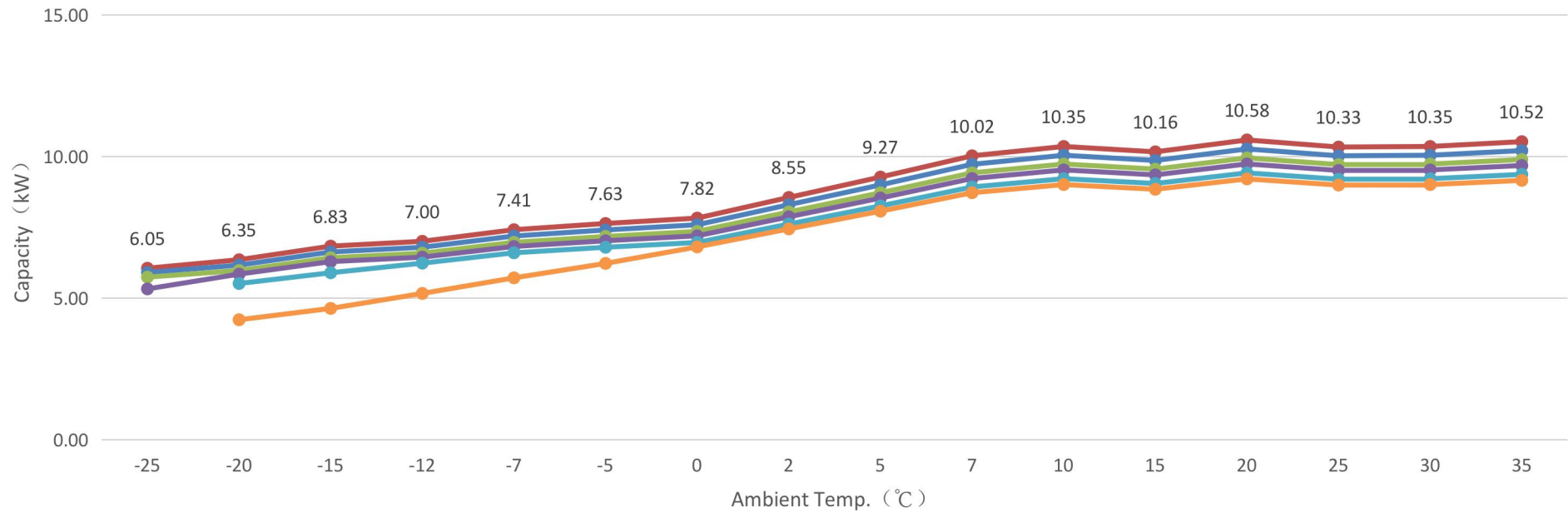
Power Input kw

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	3.10	2.68	2.69	2.35	2.36	2.37	2.16	2.18	2.21	2.24	2.25	2.03	2.05	1.85	1.78	1.79
41	3.41	2.95	2.96	2.59	2.60	2.61	2.38	2.40	2.43	2.46	2.48	2.23	2.26	2.04	1.96	1.97
45	3.88	3.35	3.36	2.94	2.95	2.96	2.70	2.73	2.76	2.80	2.81	2.54	2.56	2.31	2.23	2.24
50	3.73	3.75	3.77	3.29	3.30	3.32	3.02	3.05	3.09	3.14	3.15	2.84	2.87	2.59	2.49	2.51
55		3.75	3.76	3.64	3.66	3.67	3.35	3.38	3.43	3.47	3.49	3.15	3.18	2.87	2.76	2.77
60		3.61	3.61	3.62	3.64	3.65	3.67	3.71	3.76	3.81	3.83	3.45	3.49	3.15	3.03	3.04

COP

Outlet Water Temp.	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.95	2.37	2.54	2.98	3.14	3.22	3.62	3.92	4.19	4.47	4.60	5.00	5.16	5.58	5.81	5.88
41	1.73	2.09	2.24	2.63	2.77	2.84	3.19	3.46	3.70	3.94	4.06	4.41	4.55	4.92	5.13	5.18
45	1.48	1.78	1.91	2.24	2.36	2.42	2.72	2.95	3.15	3.36	3.46	3.76	3.88	4.20	4.37	4.42
50	1.43	1.56	1.67	1.96	2.06	2.12	2.38	2.58	2.76	2.94	3.02	3.29	3.39	3.67	3.82	3.86
55		1.47	1.57	1.71	1.80	1.85	2.08	2.25	2.41	2.57	2.64	2.87	2.96	3.21	3.34	3.37
60		1.17	1.28	1.43	1.57	1.70	1.85	2.01	2.15	2.29	2.35	2.56	2.64	2.86	2.98	3.01

CH-HP12UIMPRM 90Hz



CH-HP20UIMPRM 30Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		4.75	5.48	5.85	6.58	6.94	7.31	7.86	8.59	9.14	9.39	9.94	10.49	11.04	11.59	12.24
41		4.61	5.32	5.67	6.38	6.74	7.09	7.62	8.33	8.86	9.11	9.64	10.18	10.71	11.24	11.88
45		4.47	5.15	5.50	6.18	6.53	6.87	7.39	8.07	8.59	8.83	9.35	9.86	10.38	10.89	11.51
50		4.37	5.04	5.38	6.05	6.39	6.73	7.23	7.90	8.41	8.64	9.15	9.65	10.16	10.66	11.26
55		4.23	4.88	5.20	5.86	6.18	6.51	6.99	7.64	8.13	8.36	8.85	9.34	9.82	10.31	10.90
60		4.13	4.77	5.09	5.72	6.04	6.36	6.84	7.47	7.95	8.17	8.65	9.13	9.60	10.08	10.65

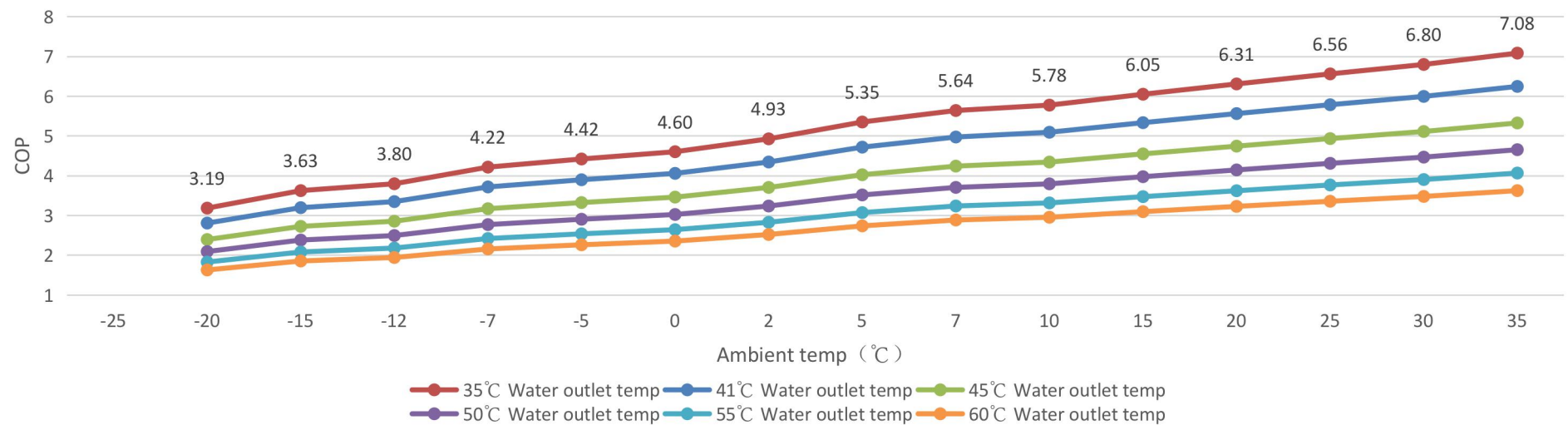
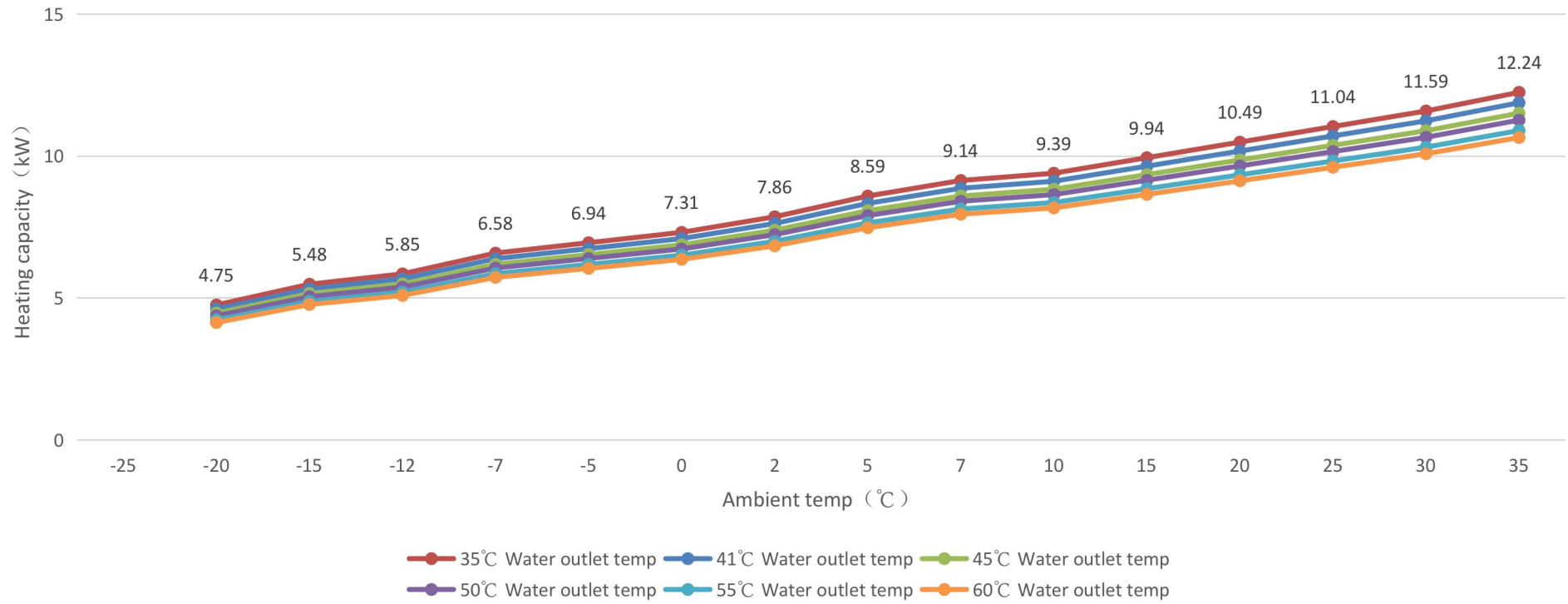
Power Input kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		1.49	1.51	1.54	1.56	1.57	1.59	1.59	1.60	1.62	1.63	1.64	1.66	1.68	1.70	1.73
41		1.64	1.66	1.69	1.72	1.73	1.75	1.75	1.77	1.78	1.79	1.81	1.83	1.85	1.87	1.90
45		1.86	1.89	1.92	1.95	1.96	1.98	1.99	2.01	2.02	2.03	2.05	2.08	2.10	2.13	2.16
50		2.09	2.12	2.16	2.18	2.20	2.22	2.23	2.25	2.27	2.28	2.30	2.33	2.35	2.39	2.42
55		2.31	2.34	2.39	2.42	2.43	2.46	2.47	2.49	2.51	2.52	2.55	2.58	2.61	2.64	2.68
60		2.54	2.57	2.62	2.65	2.67	2.70	2.71	2.73	2.75	2.76	2.79	2.83	2.86	2.90	2.94

COP

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35		3.19	3.63	3.80	4.22	4.42	4.60	4.93	5.35	5.64	5.78	6.05	6.31	6.56	6.80	7.08
41		2.81	3.20	3.35	3.72	3.90	4.06	4.35	4.72	4.97	5.09	5.34	5.56	5.79	6.00	6.25
45		2.40	2.73	2.86	3.17	3.33	3.46	3.71	4.02	4.24	4.34	4.55	4.74	4.94	5.11	5.33
50		2.09	2.38	2.50	2.77	2.91	3.03	3.24	3.52	3.71	3.80	3.98	4.15	4.31	4.47	4.66
55		1.83	2.08	2.18	2.42	2.54	2.64	2.83	3.07	3.24	3.32	3.47	3.62	3.77	3.90	4.07
60		1.63	1.86	1.94	2.16	2.26	2.36	2.52	2.74	2.89	2.96	3.10	3.23	3.36	3.48	3.63

CH-HP20UIMPRM 30Hz



CH-HP20UIMPRM **57.5Hz**

Heating Capacity kW

Water outlet	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	6.37	7.60	8.77	9.35	10.52	11.10	11.69	12.56	13.73	14.61	15.02	15.90	16.77	17.65	17.28	18.11
41	6.18	7.37	8.50	9.07	10.20	10.77	11.34	12.19	13.32	14.17	14.57	15.42	16.27	17.12	16.77	17.56
45	5.99	7.14	8.24	8.79	9.89	10.44	10.99	11.81	12.91	13.73	14.12	14.94	15.77	16.59	16.25	17.02
50	5.86	6.99	8.06	8.60	9.68	10.22	10.75	11.56	12.63	13.44	13.82	14.62	15.43	16.24	15.90	16.66
55		6.76	7.80	8.32	9.36	9.88	10.40	11.18	12.22	13.00	13.37	14.15	14.93	15.71	15.38	16.12
60		6.61	7.63	8.13	9.15	9.66	10.17	10.93	11.95	12.71	13.07	13.83	14.59	15.35	15.04	15.75

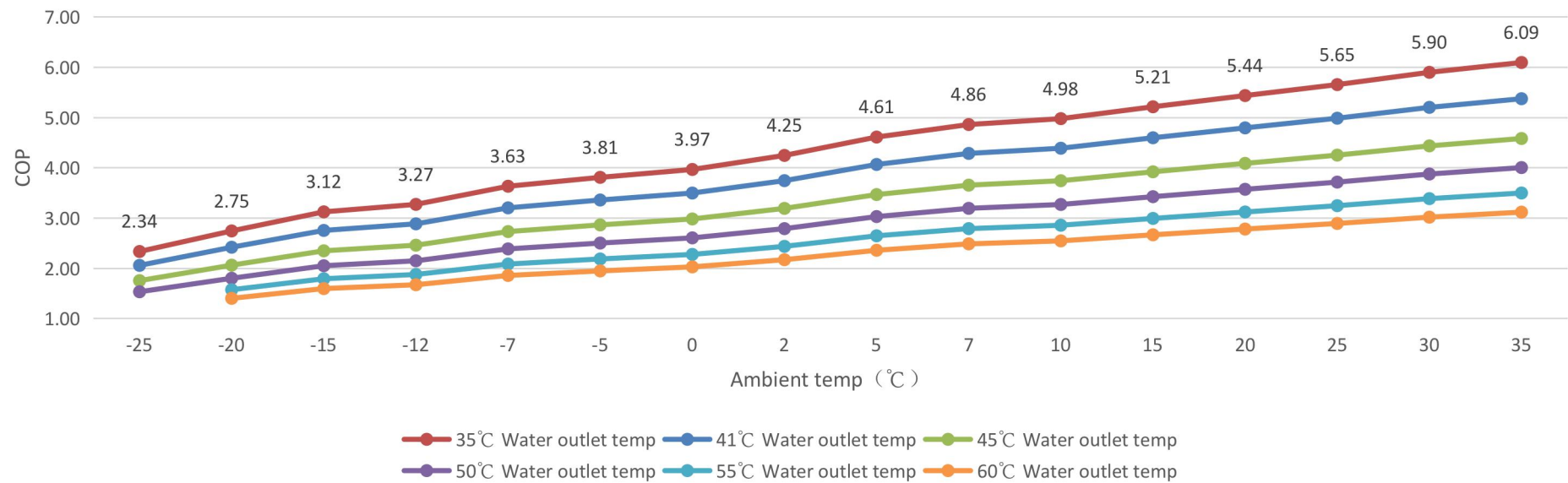
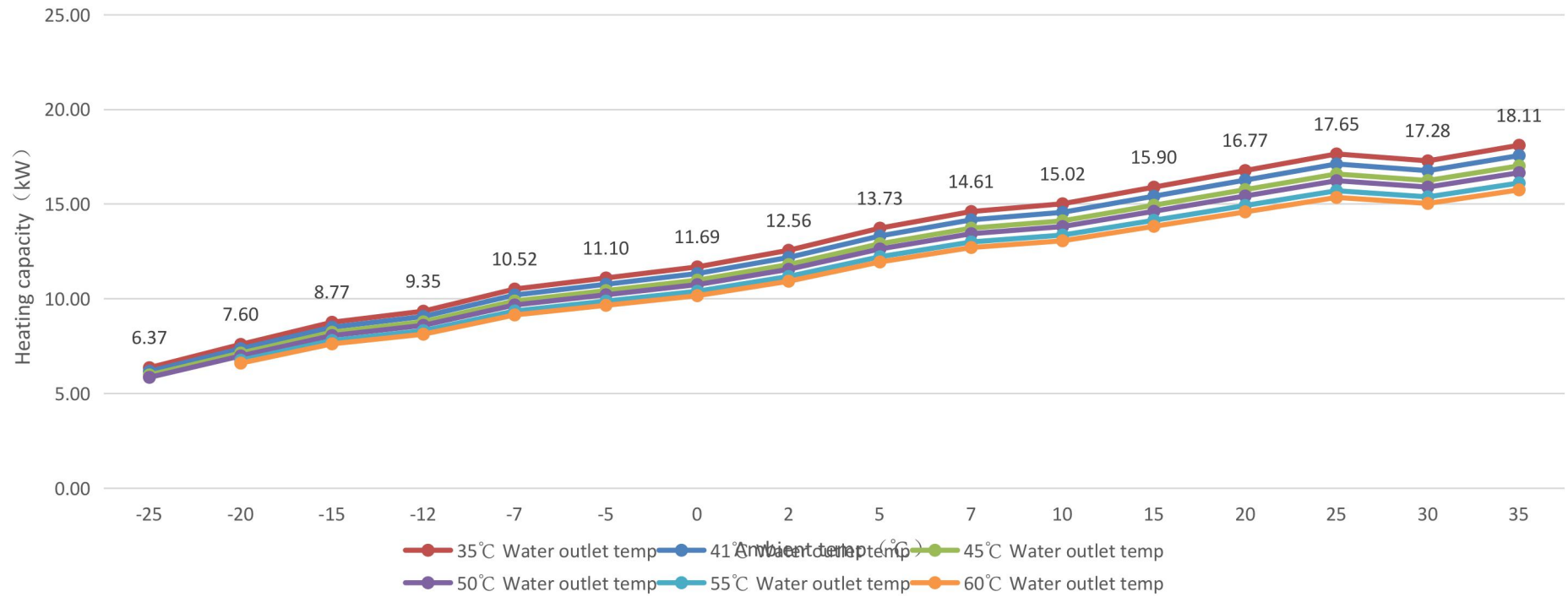
Power Input kW

Water outlet	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.73	2.77	2.81	2.86	2.90	2.91	2.95	2.96	2.98	3.01	3.02	3.05	3.09	3.12	2.93	2.97
41	3.00	3.04	3.09	3.14	3.18	3.21	3.24	3.25	3.28	3.31	3.32	3.35	3.39	3.43	3.22	3.27
45	3.41	3.46	3.51	3.57	3.62	3.64	3.68	3.70	3.72	3.76	3.77	3.81	3.86	3.90	3.66	3.71
50	3.82	3.87	3.93	4.00	4.05	4.08	4.12	4.14	4.17	4.21	4.22	4.27	4.32	4.37	4.10	4.16
55		4.29	4.35	4.43	4.49	4.52	4.57	4.59	4.62	4.66	4.68	4.73	4.78	4.84	4.54	4.61
60		4.70	4.77	4.86	4.92	4.95	5.01	5.03	5.06	5.11	5.13	5.18	5.24	5.31	4.98	5.05

COP

Water outlet	Ambient Temperature(℃)															
Water outlet(℃)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.34	2.75	3.12	3.27	3.63	3.81	3.97	4.25	4.61	4.86	4.98	5.21	5.44	5.65	5.90	6.09
41	2.06	2.42	2.75	2.89	3.20	3.36	3.50	3.74	4.07	4.29	4.39	4.60	4.79	4.99	5.20	5.37
45	1.76	2.06	2.35	2.46	2.73	2.87	2.98	3.19	3.47	3.66	3.74	3.92	4.09	4.25	4.44	4.58
50	1.54	1.80	2.05	2.15	2.39	2.50	2.61	2.79	3.03	3.19	3.27	3.43	3.57	3.72	3.88	4.00
55		1.58	1.79	1.88	2.09	2.19	2.28	2.44	2.65	2.79	2.86	2.99	3.12	3.25	3.39	3.50
60		1.40	1.60	1.67	1.86	1.95	2.03	2.17	2.36	2.49	2.55	2.67	2.78	2.89	3.02	3.12

CH-HP20UIMPRM 57.5Hz



CH-HP20UIMPRM 80Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	8.74	10.43	12.03	12.51	14.08	14.86	14.44	15.52	16.97	18.05	18.56	18.00	18.99	18.17	17.28	18.11
41	8.49	10.13	11.68	12.14	13.66	14.42	14.01	15.06	16.46	17.51	18.00	17.46	18.42	17.63	16.77	17.56
45	8.25	9.84	11.35	11.76	13.23	13.97	13.57	14.59	15.95	16.97	17.44	16.92	17.85	17.08	16.25	17.02
50	8.02	9.57	11.04	11.51	12.95	13.67	13.28	14.28	15.61	16.61	17.07	16.56	17.47	16.72	15.90	16.66
55		8.35	9.64	11.14	12.53	13.23	12.85	13.82	15.10	16.06	16.51	16.02	16.91	16.17	15.38	16.12
60		8.17	9.42	10.05	11.30	11.93	12.56	13.50	14.76	15.70	16.14	15.66	16.53	15.81	15.04	15.75

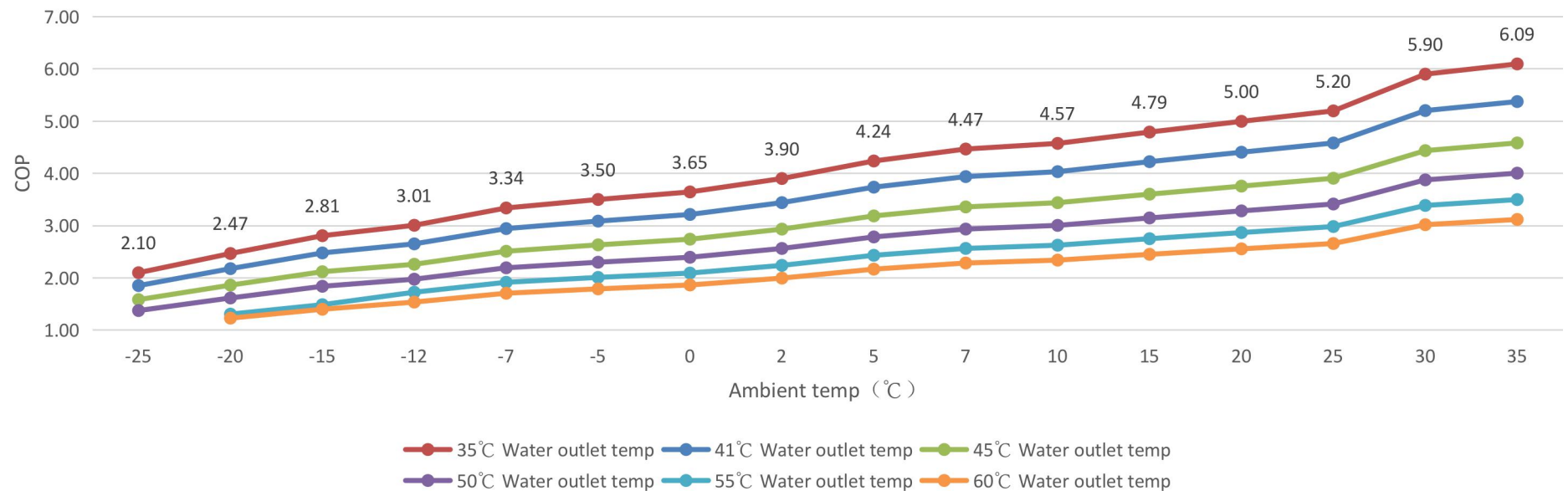
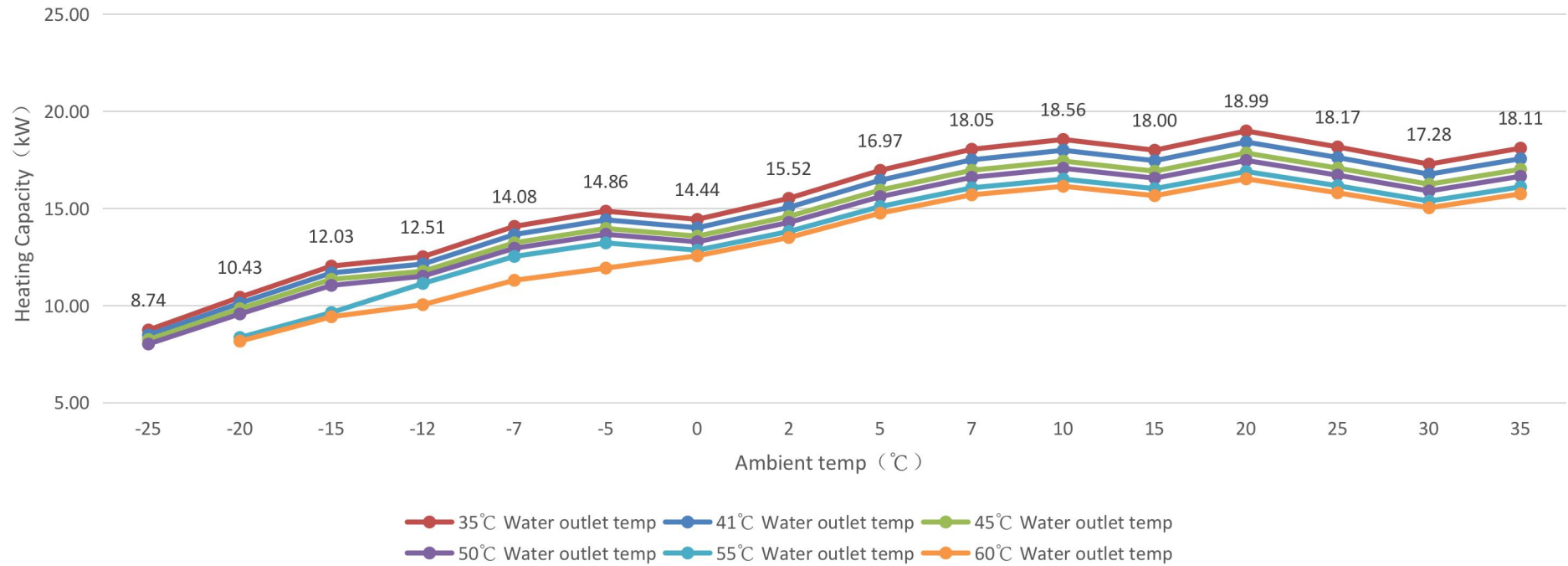
Power Input kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	4.16	4.23	4.28	4.16	4.22	4.24	3.96	3.98	4.00	4.04	4.06	3.76	3.80	3.50	2.93	2.97
41	4.58	4.65	4.71	4.58	4.64	4.67	4.36	4.38	4.40	4.45	4.46	4.13	4.18	3.85	3.22	3.27
45	5.20	5.28	5.36	5.20	5.27	5.31	4.95	4.97	5.00	5.05	5.07	4.70	4.75	4.37	3.66	3.71
50	5.83	5.92	6.00	5.83	5.90	5.94	5.55	5.57	5.61	5.66	5.68	5.26	5.32	4.90	4.10	4.16
55		6.39	6.48	6.45	6.54	6.58	6.14	6.17	6.21	6.26	6.29	5.82	5.89	5.42	4.54	4.61
60		6.63	6.72	6.53	6.62	6.66	6.73	6.76	6.81	6.87	6.90	6.39	6.46	5.95	4.98	5.05

COP

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.10	2.47	2.81	3.01	3.34	3.50	3.65	3.90	4.24	4.47	4.57	4.79	5.00	5.20	5.90	6.09
41	1.85	2.18	2.48	2.65	2.94	3.09	3.21	3.44	3.74	3.94	4.03	4.22	4.41	4.58	5.20	5.37
45	1.58	1.86	2.12	2.26	2.51	2.63	2.74	2.93	3.19	3.36	3.44	3.60	3.76	3.91	4.44	4.58
50	1.38	1.62	1.84	1.98	2.19	2.30	2.40	2.56	2.78	2.94	3.01	3.15	3.28	3.41	3.88	4.00
55		1.31	1.49	1.73	1.92	2.01	2.09	2.24	2.43	2.56	2.63	2.75	2.87	2.98	3.39	3.50
60		1.23	1.40	1.54	1.71	1.79	1.87	2.00	2.17	2.29	2.34	2.45	2.56	2.66	3.02	3.12

CH-HP20UIMPRM 80Hz



CH-HP20UIMPRM 90Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	9.83	10.95	12.63	12.51	14.08	14.86	14.44	15.52	16.97	18.05	18.56	18.00	18.99	18.17	17.28	18.11
41	9.55	10.62	12.26	12.14	13.66	14.42	14.01	15.06	16.46	17.51	18.00	17.46	18.42	17.63	16.77	17.56
45	9.28	10.29	11.88	11.76	13.23	13.97	13.57	14.59	15.95	16.97	17.44	16.92	17.85	17.08	16.25	17.02
50	8.42	10.07	11.62	11.51	12.95	13.67	13.28	14.28	15.61	16.61	17.07	16.56	17.47	16.72	15.90	16.66
55		8.77	10.12	11.14	12.53	13.23	12.85	13.82	15.10	16.06	16.51	16.02	16.91	16.17	15.38	16.12
60		8.57	9.89	10.05	11.30	11.93	12.56	13.50	14.76	15.70	16.14	15.66	16.53	15.81	15.04	15.75

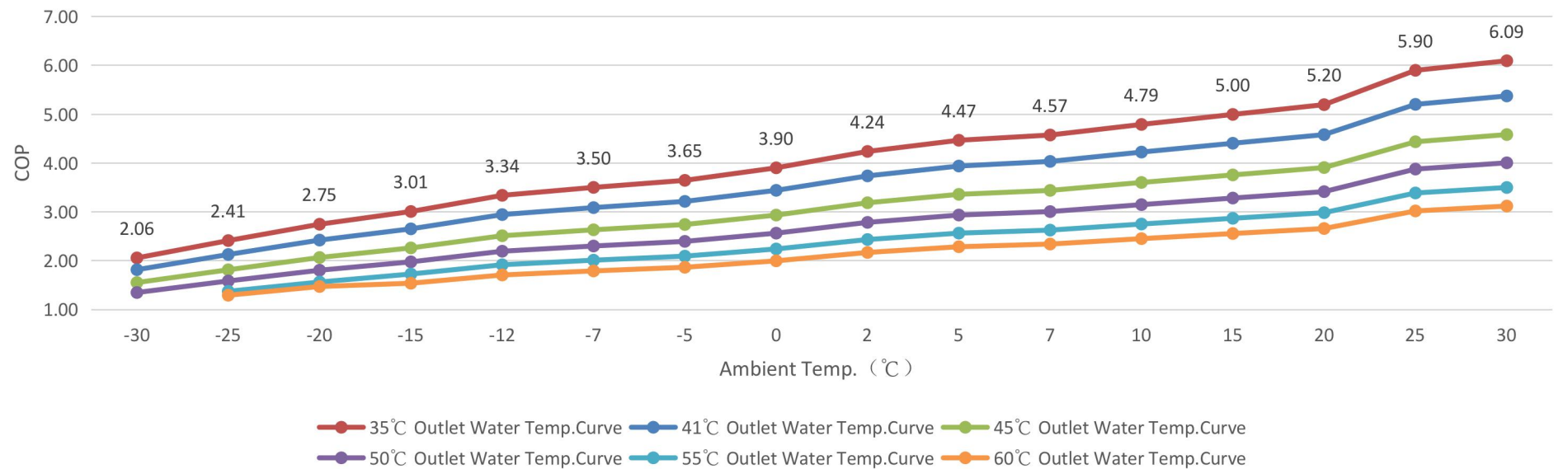
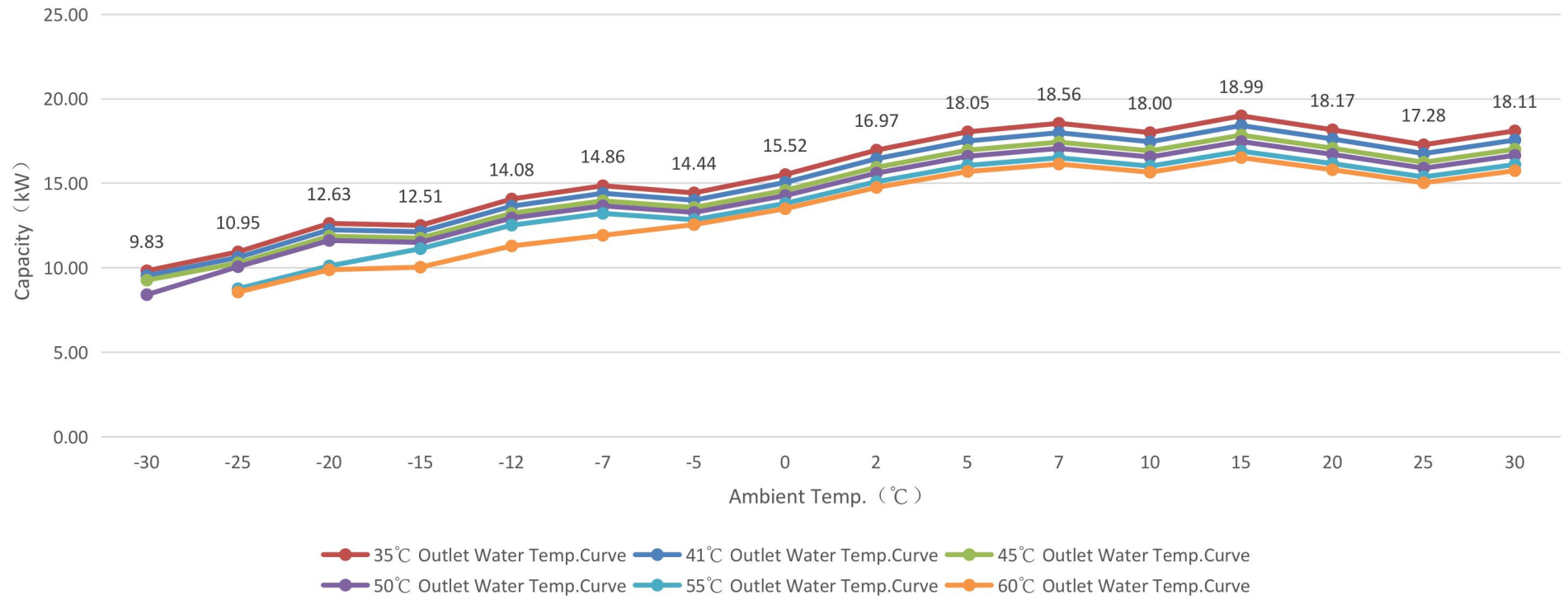
Power Input kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	4.78	4.54	4.60	4.16	4.22	4.24	3.96	3.98	4.00	4.04	4.06	3.76	3.80	3.50	2.93	2.97
41	5.26	4.99	5.06	4.58	4.64	4.67	4.36	4.38	4.40	4.45	4.46	4.13	4.18	3.85	3.22	3.27
45	5.98	5.68	5.75	5.20	5.27	5.31	4.95	4.97	5.00	5.05	5.07	4.70	4.75	4.37	3.66	3.71
50	6.25	6.36	6.44	5.83	5.90	5.94	5.55	5.57	5.61	5.66	5.68	5.26	5.32	4.90	4.10	4.16
55		6.39	6.48	6.45	6.54	6.58	6.14	6.17	6.21	6.26	6.29	5.82	5.89	5.42	4.54	4.61
60		6.63	6.72	6.53	6.62	6.66	6.73	6.76	6.81	6.87	6.90	6.39	6.46	5.95	4.98	5.05

COP

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.06	2.41	2.75	3.01	3.34	3.50	3.65	3.90	4.24	4.47	4.57	4.79	5.00	5.20	5.90	6.09
41	1.82	2.13	2.42	2.65	2.94	3.09	3.21	3.44	3.74	3.94	4.03	4.22	4.41	4.58	5.20	5.37
45	1.55	1.81	2.07	2.26	2.51	2.63	2.74	2.93	3.19	3.36	3.44	3.60	3.76	3.91	4.44	4.58
50	1.35	1.58	1.80	1.98	2.19	2.30	2.40	2.56	2.78	2.94	3.01	3.15	3.28	3.41	3.88	4.00
55		1.37	1.56	1.73	1.92	2.01	2.09	2.24	2.43	2.56	2.63	2.75	2.87	2.98	3.39	3.50
60		1.29	1.47	1.54	1.71	1.79	1.87	2.00	2.17	2.29	2.34	2.45	2.56	2.66	3.02	3.12

CH-HP20UIMPRM 90Hz



CH-HP24UIMPRM 30Hz

Heating Capacity kW

Water outlet		Ambient Temperature(°C)															
Water outlet(°C)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35			5.57	6.43	6.86	7.71	8.14	8.57	9.21	10.07	10.71	11.01	11.66	12.30	12.94	13.59	14.36
41			5.40	6.24	6.65	7.48	7.90	8.31	8.94	9.77	10.39	10.68	11.31	11.93	12.55	13.18	13.93
45			5.24	6.04	6.45	7.25	7.65	8.06	8.66	9.47	10.07	10.35	10.96	11.56	12.17	12.77	13.50
50			5.13	5.91	6.31	7.10	7.49	7.89	8.48	9.27	9.86	10.13	10.72	11.32	11.91	12.50	13.21
55			4.96	5.72	6.10	6.87	7.25	7.63	8.20	8.96	9.54	9.80	10.37	10.95	11.52	12.09	12.78
60			4.85	5.59	5.97	6.71	7.08	7.46	8.02	8.76	9.32	9.58	10.14	10.70	11.26	11.82	12.49

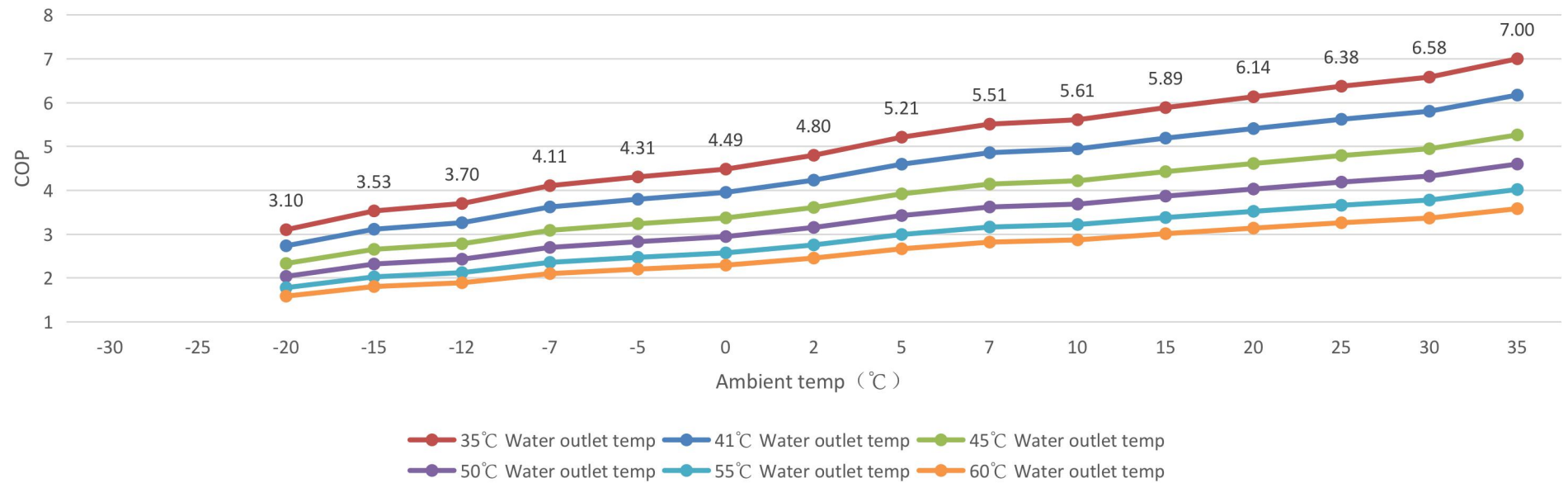
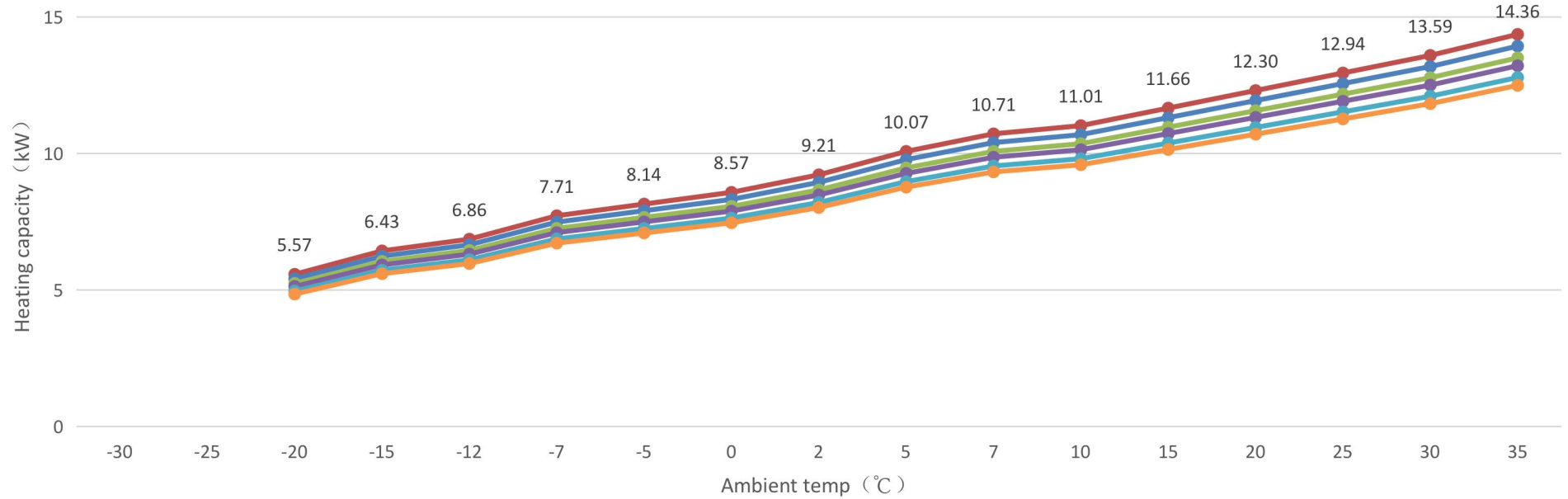
Power Input kW

Water outlet(℃)		Ambient Temperature(℃)															
Water outlet(℃)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35			1.80	1.82	1.85	1.88	1.89	1.91	1.92	1.93	1.94	1.96	1.98	2.00	2.03	2.06	2.05
41			1.97	2.00	2.04	2.07	2.08	2.10	2.11	2.12	2.14	2.16	2.18	2.21	2.23	2.27	2.26
45			2.24	2.27	2.32	2.35	2.36	2.39	2.40	2.41	2.43	2.45	2.47	2.51	2.54	2.58	2.56
50			2.51	2.55	2.59	2.63	2.65	2.68	2.69	2.70	2.72	2.75	2.77	2.81	2.84	2.89	2.87
55			2.78	2.82	2.87	2.91	2.93	2.96	2.97	2.99	3.01	3.04	3.07	3.11	3.15	3.20	3.18
60			3.05	3.09	3.15	3.19	3.21	3.25	3.26	3.28	3.30	3.34	3.37	3.41	3.45	3.51	3.49

COP

Water outlet		Ambient Temperature(℃)															
Water outlet(℃)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35			3.10	3.53	3.70	4.11	4.31	4.49	4.80	5.21	5.51	5.61	5.89	6.14	6.38	6.58	7.00
41			2.74	3.12	3.26	3.62	3.80	3.96	4.23	4.60	4.86	4.95	5.19	5.41	5.62	5.81	6.17
45			2.33	2.66	2.78	3.09	3.24	3.37	3.61	3.92	4.14	4.22	4.43	4.61	4.79	4.95	5.27
50			2.04	2.32	2.43	2.70	2.83	2.95	3.16	3.43	3.62	3.69	3.87	4.03	4.19	4.33	4.60
55			1.78	2.03	2.12	2.36	2.47	2.58	2.76	2.99	3.16	3.22	3.38	3.52	3.66	3.78	4.02
60			1.59	1.81	1.89	2.10	2.20	2.30	2.46	2.67	2.82	2.87	3.01	3.14	3.26	3.37	3.58

CH-HP24UIMPRM 30Hz



CH-HP24UIMPRM 57.5Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)																
Water outlet(°C)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	7.46	9.11	10.77	12.43	13.26	14.91	15.74	16.57	17.81	19.47	20.71	21.29	22.54	23.78	25.02	24.88	25.33
41	7.23	8.84	10.45	12.06	12.86	14.47	15.27	16.07	17.28	18.89	20.09	20.66	21.86	23.07	24.27	24.13	24.57
45	7.01	8.57	10.13	11.68	12.46	14.02	14.80	15.58	16.75	18.30	19.47	20.02	21.18	22.35	23.52	23.39	23.81
50	6.86	8.39	9.91	11.43	12.20	13.72	14.48	15.25	16.39	17.91	19.06	19.59	20.73	21.88	23.02	22.89	23.30
55			9.59	11.06	11.80	13.27	14.01	14.75	15.85	17.33	18.44	18.95	20.06	21.16	22.27	22.14	22.54
60			9.37	10.81	11.53	12.98	13.70	14.42	15.50	16.94	18.02	18.53	19.61	20.69	21.77	21.65	22.04

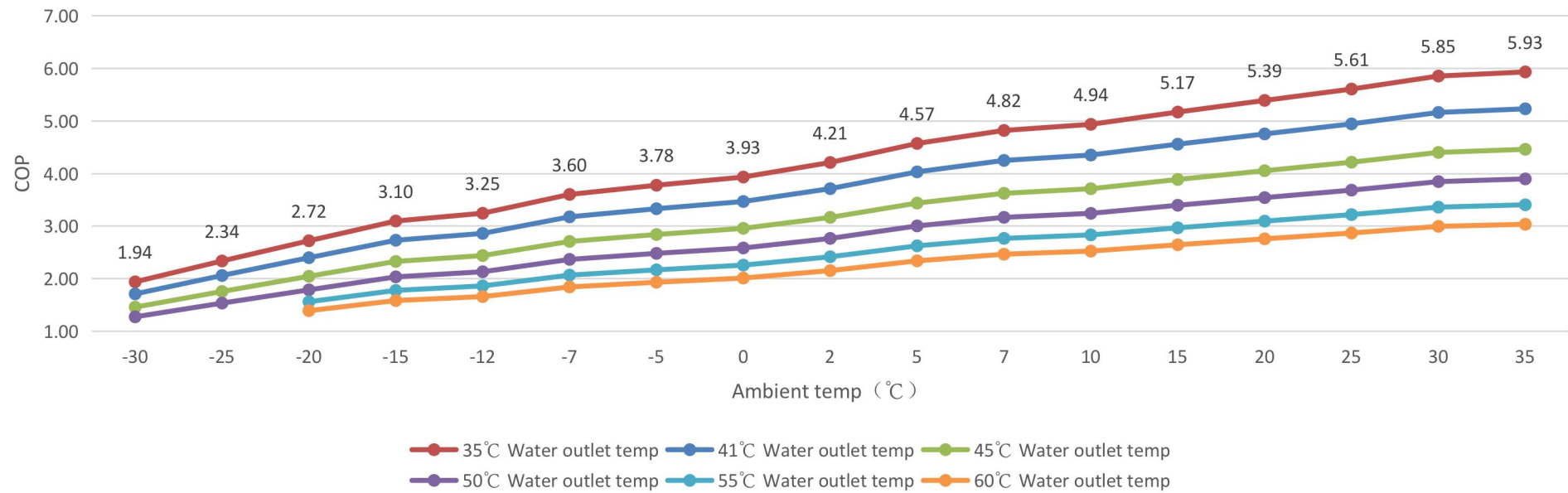
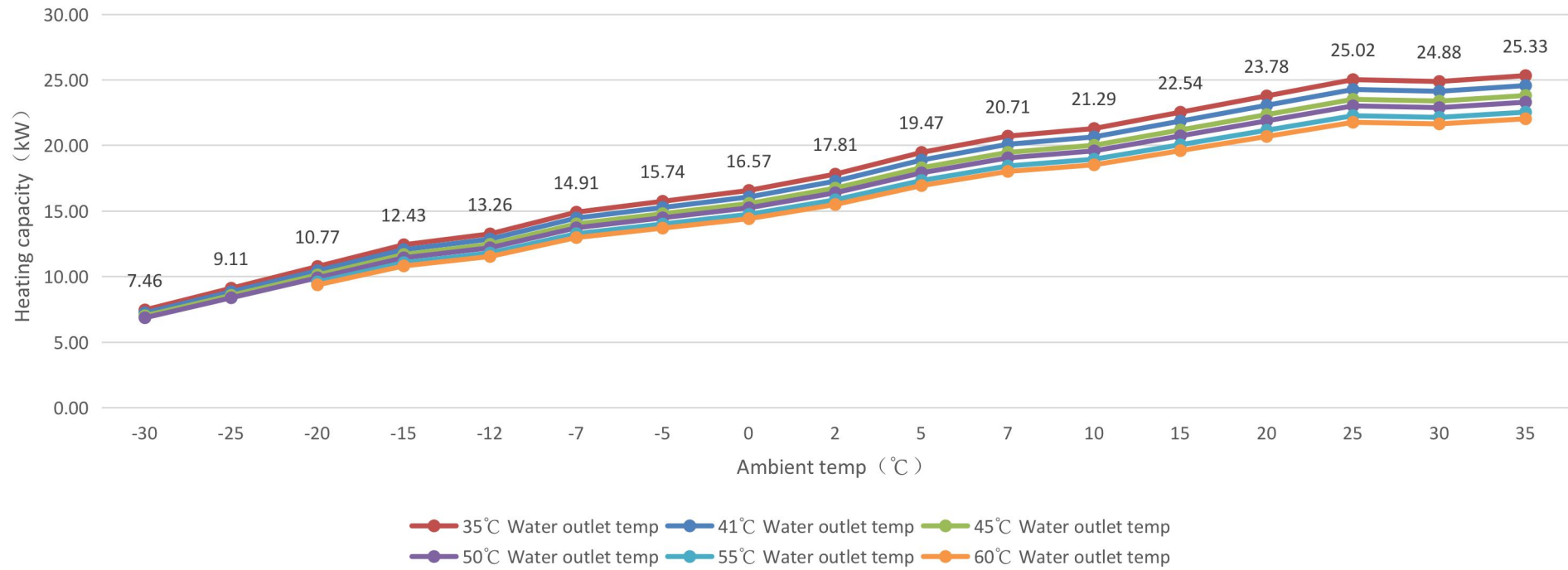
Power Input kW

Water outlet	Ambient Temperature(°C)																
Water outlet(°C)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	3.84	3.90	3.96	4.01	4.08	4.14	4.17	4.21	4.23	4.26	4.30	4.31	4.36	4.41	4.46	4.25	4.27
41	4.23	4.29	4.35	4.41	4.49	4.55	4.58	4.63	4.65	4.68	4.73	4.75	4.80	4.85	4.91	4.68	4.70
45	4.80	4.87	4.95	5.01	5.11	5.17	5.21	5.27	5.29	5.32	5.37	5.39	5.45	5.51	5.58	5.31	5.34
50	5.38	5.46	5.54	5.62	5.72	5.80	5.83	5.90	5.92	5.96	6.02	6.04	6.10	6.18	6.25	5.95	5.98
55			6.13	6.22	6.33	6.42	6.46	6.53	6.56	6.60	6.66	6.69	6.76	6.84	6.92	6.59	6.62
60			6.73	6.82	6.94	7.04	7.08	7.16	7.19	7.24	7.31	7.33	7.41	7.50	7.59	7.23	7.26

COP

Water outlet	Ambient Temperature(°C)																
Water outlet(°C)	-30	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	1.94	2.34	2.72	3.10	3.25	3.60	3.78	3.93	4.21	4.57	4.82	4.94	5.17	5.39	5.61	5.85	5.93
41	1.71	2.06	2.40	2.73	2.86	3.18	3.33	3.47	3.71	4.03	4.25	4.35	4.56	4.75	4.94	5.16	5.23
45	1.46	1.76	2.05	2.33	2.44	2.71	2.84	2.96	3.17	3.44	3.62	3.71	3.89	4.05	4.22	4.40	4.46
50	1.28	1.54	1.79	2.04	2.13	2.37	2.48	2.59	2.77	3.00	3.17	3.24	3.40	3.54	3.68	3.85	3.90
55			1.56	1.78	1.86	2.07	2.17	2.26	2.42	2.63	2.77	2.83	2.97	3.10	3.22	3.36	3.41
60			1.39	1.59	1.66	1.84	1.93	2.01	2.15	2.34	2.47	2.53	2.65	2.76	2.87	3.00	3.04

CH-HP24UIMPRM 57.5Hz



CH-HP24UIMPRM 80Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	12.57	14.86	17.14	18.06	19.88	20.47	20.42	22.08	23.15	24.46	25.16	24.28	25.03	24.96	24.88	25.33
41	12.19	14.41	16.63	17.52	19.28	19.86	19.81	21.42	22.46	23.73	24.41	23.55	24.28	24.21	24.13	24.57
45	11.82	13.97	16.11	16.98	18.69	19.24	19.19	20.76	21.76	22.99	23.65	22.82	23.53	23.46	23.39	23.81
50	11.57	13.67	15.77	16.62	18.29	18.83	18.79	20.31	21.30	22.50	23.15	22.34	23.03	22.96	22.89	23.30
55		13.06	14.52	16.07	17.69	18.22	18.17	19.65	20.60	21.77	22.39	21.61	22.28	22.21	22.14	22.54
60		11.22	12.27	13.74	15.28	16.17	17.77	19.21	20.14	21.28	21.89	21.12	21.78	21.72	21.65	22.04

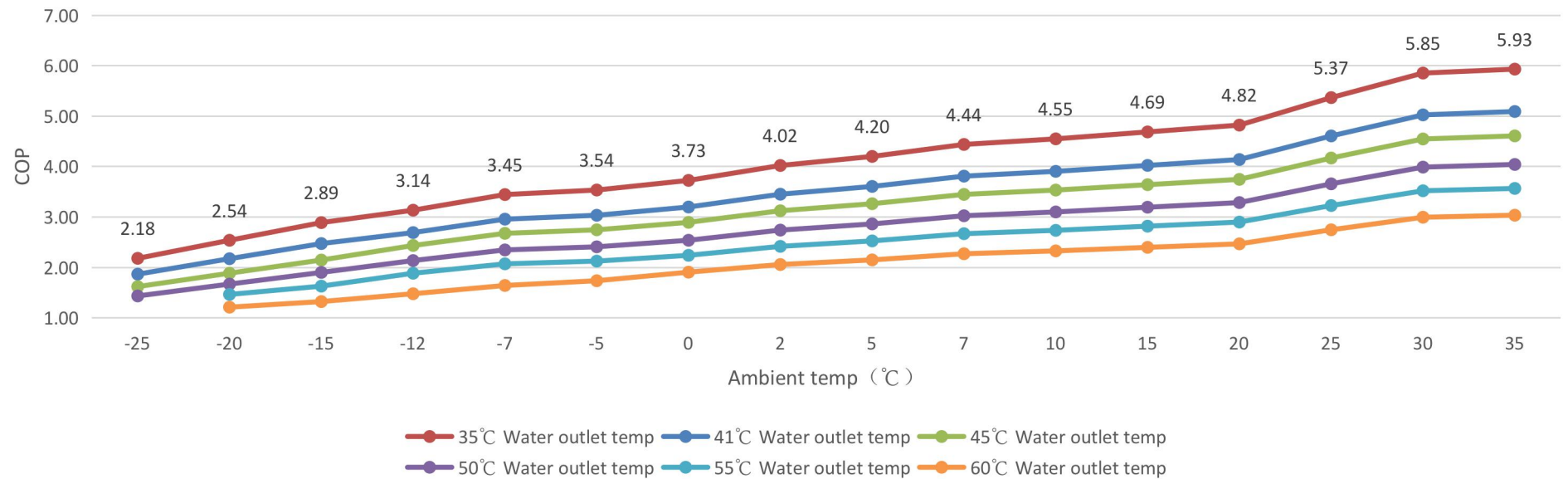
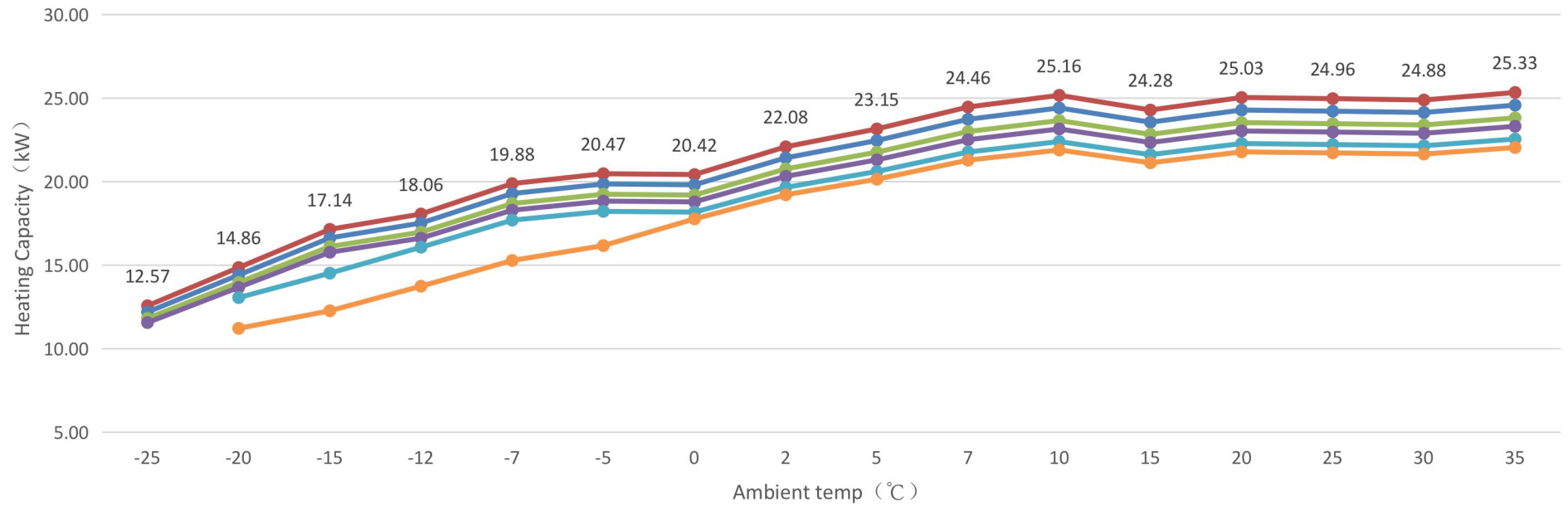
Power Input kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	5.76	5.85	5.93	5.76	5.77	5.79	5.48	5.49	5.51	5.51	5.53	5.18	5.19	4.65	4.25	4.27
41	6.53	6.63	6.72	6.51	6.52	6.54	6.19	6.20	6.23	6.23	6.25	5.85	5.86	5.25	4.80	4.83
45	7.29	7.40	7.51	6.97	6.98	7.01	6.63	6.64	6.67	6.67	6.69	6.27	6.28	5.63	5.14	5.17
50	8.06	8.18	8.29	7.78	7.79	7.82	7.40	7.41	7.44	7.44	7.47	6.99	7.01	6.28	5.74	5.76
55		8.91	8.91	8.52	8.54	8.57	8.11	8.13	8.15	8.15	8.18	7.67	7.68	6.88	6.29	6.32
60		9.25	9.27	9.29	9.30	9.31	9.32	9.33	9.37	9.37	9.40	8.81	8.82	7.91	7.23	7.26

COP

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.18	2.54	2.89	3.14	3.45	3.54	3.73	4.02	4.20	4.44	4.55	4.69	4.82	5.37	5.85	5.93
41	1.87	2.17	2.47	2.69	2.96	3.03	3.20	3.45	3.61	3.81	3.91	4.02	4.14	4.61	5.03	5.09
45	1.62	1.89	2.15	2.44	2.68	2.75	2.89	3.12	3.26	3.45	3.53	3.64	3.75	4.17	4.55	4.61
50	1.44	1.67	1.90	2.14	2.35	2.41	2.54	2.74	2.86	3.03	3.10	3.19	3.29	3.66	3.99	4.04
55		1.47	1.63	1.89	2.07	2.13	2.24	2.42	2.53	2.67	2.74	2.82	2.90	3.23	3.52	3.57
60		1.21	1.32	1.48	1.64	1.74	1.91	2.06	2.15	2.27	2.33	2.40	2.47	2.75	3.00	3.04

CH-HP24UIMPRM 80Hz



CH-HP24UIMPRM 90Hz

Heating Capacity kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	14.14	15.65	17.95	18.06	19.88	20.47	20.42	22.08	23.15	24.46	25.16	24.28	25.03	24.96	24.88	25.33
41	13.44	15.18	17.41	17.52	19.28	19.86	19.81	21.42	22.46	23.73	24.41	23.55	24.28	24.21	24.13	24.57
45	12.59	14.71	16.87	16.98	18.69	19.24	19.19	20.76	21.76	22.99	23.65	22.82	23.53	23.46	23.39	23.81
50	11.85	14.40	16.51	16.62	18.29	18.83	18.79	20.31	21.30	22.50	23.15	22.34	23.03	22.96	22.89	23.30
55		13.06	14.52	16.07	17.69	18.22	18.17	19.65	20.60	21.77	22.39	21.61	22.28	22.21	22.14	22.54
60		11.22	12.27	13.74	15.28	16.17	17.77	19.21	20.14	21.28	21.89	21.12	21.78	21.72	21.65	22.04

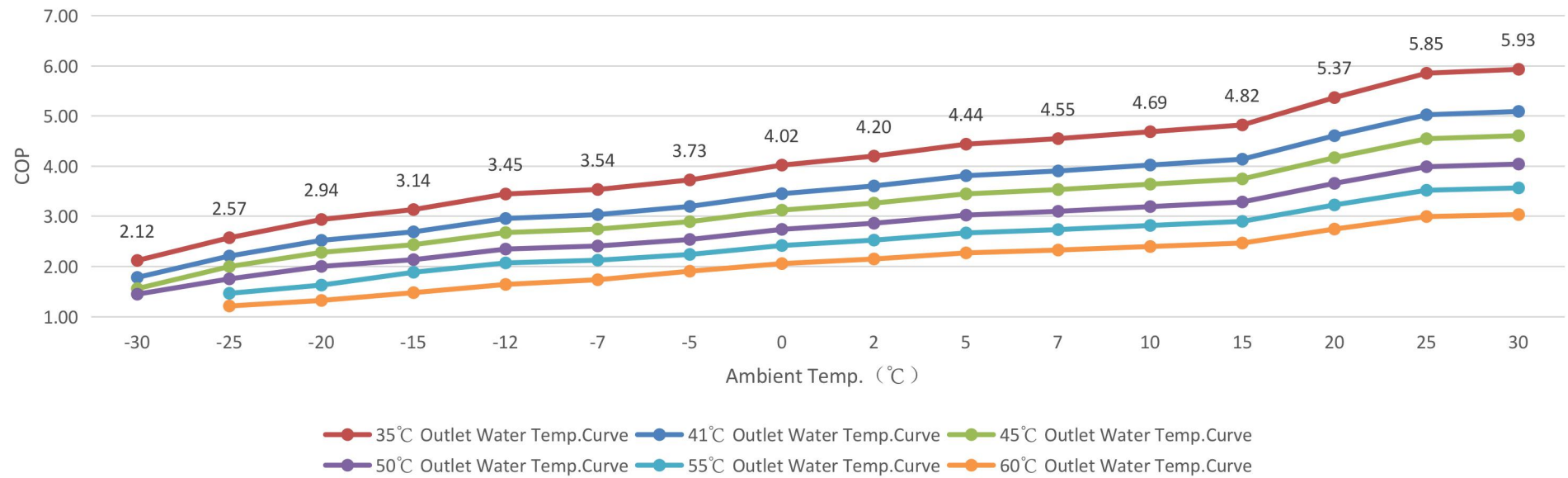
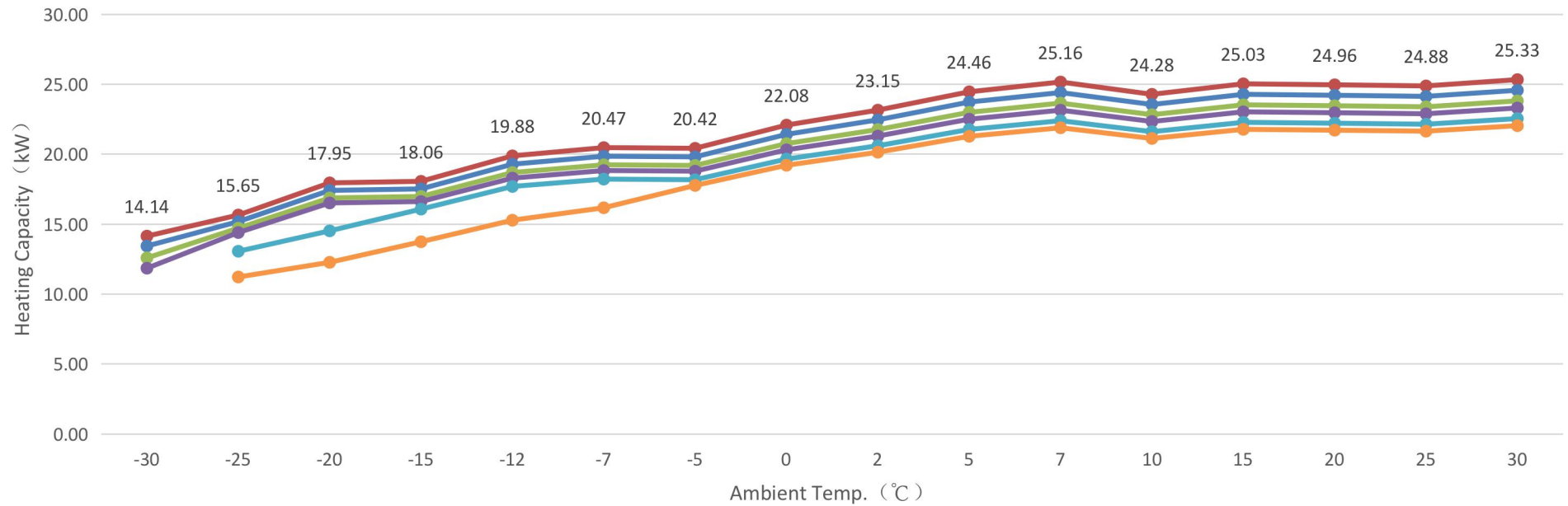
Power Input kW

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	6.67	6.08	6.11	5.76	5.77	5.79	5.48	5.49	5.51	5.51	5.53	5.18	5.19	4.65	4.25	4.27
41	7.54	6.87	6.90	6.51	6.52	6.54	6.19	6.20	6.23	6.23	6.25	5.85	5.86	5.25	4.80	4.83
45	8.07	7.36	7.39	6.97	6.98	7.01	6.63	6.64	6.67	6.67	6.69	6.27	6.28	5.63	5.14	5.17
50	8.18	8.21	8.25	7.78	7.79	7.82	7.40	7.41	7.44	7.44	7.47	6.99	7.01	6.28	5.74	5.76
55		8.91	8.91	8.52	8.54	8.57	8.11	8.13	8.15	8.15	8.18	7.67	7.68	6.88	6.29	6.32
60		9.25	9.27	9.29	9.30	9.31	9.32	9.33	9.37	9.37	9.40	8.81	8.82	7.91	7.23	7.26

COP

Water outlet	Ambient Temperature(°C)															
Water outlet(°C)	-25	-20	-15	-12	-7	-5	0	2	5	7	10	15	20	25	30	35
35	2.12	2.57	2.94	3.14	3.45	3.54	3.73	4.02	4.20	4.44	4.55	4.69	4.82	5.37	5.85	5.93
41	1.78	2.21	2.52	2.69	2.96	3.03	3.20	3.45	3.61	3.81	3.91	4.02	4.14	4.61	5.03	5.09
45	1.56	2.00	2.28	2.44	2.68	2.75	2.89	3.12	3.26	3.45	3.53	3.64	3.75	4.17	4.55	4.61
50	1.45	1.75	2.00	2.14	2.35	2.41	2.54	2.74	2.86	3.03	3.10	3.19	3.29	3.66	3.99	4.04
55		1.47	1.63	1.89	2.07	2.13	2.24	2.42	2.53	2.67	2.74	2.82	2.90	3.23	3.52	3.57
60		1.21	1.32	1.48	1.64	1.74	1.91	2.06	2.15	2.27	2.33	2.40	2.47	2.75	3.00	3.04

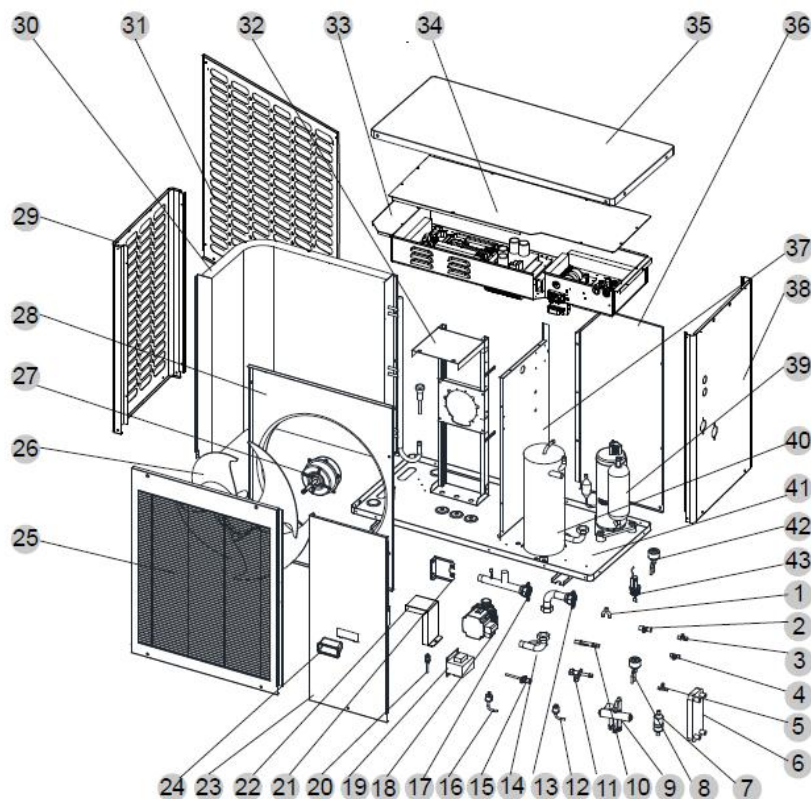
CH-HP24UIMPRM 90Hz



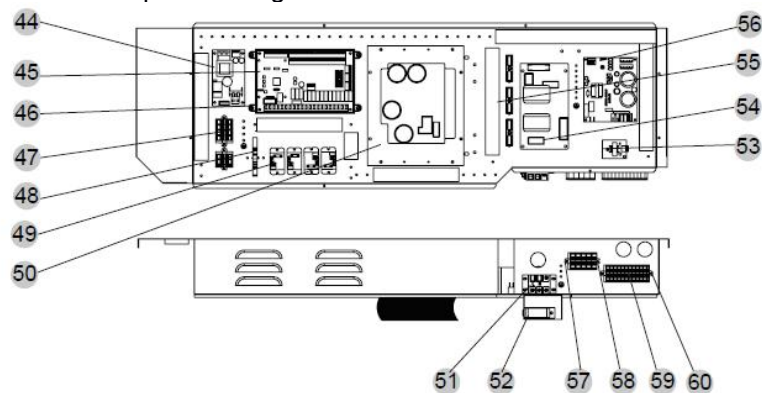
10. Explosion View

Model and Code: CH-HP08UIMPRK (13100033)

A. Whole Unit Exploded Diagram



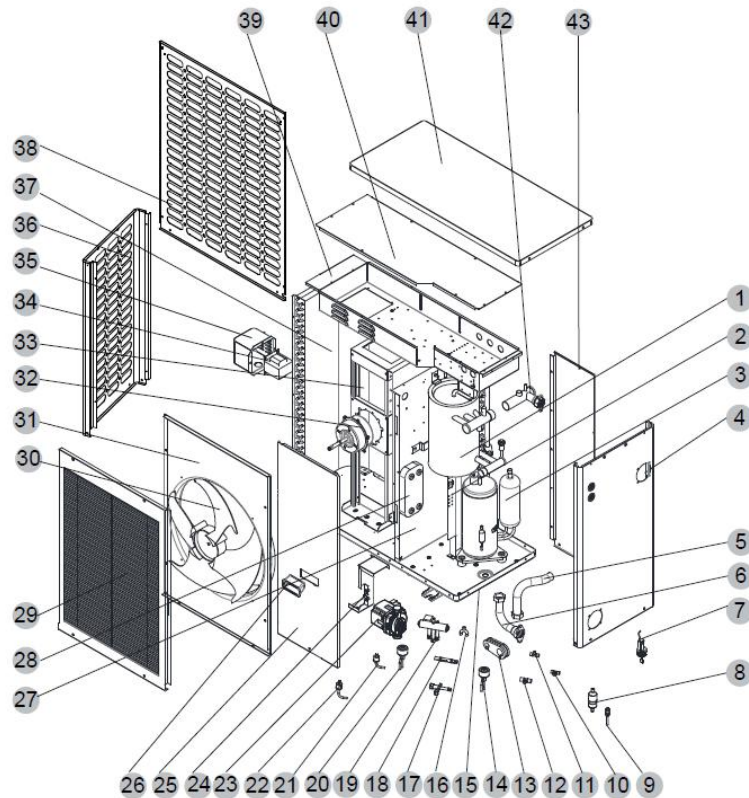
B. Electric Box Exploded Diagram



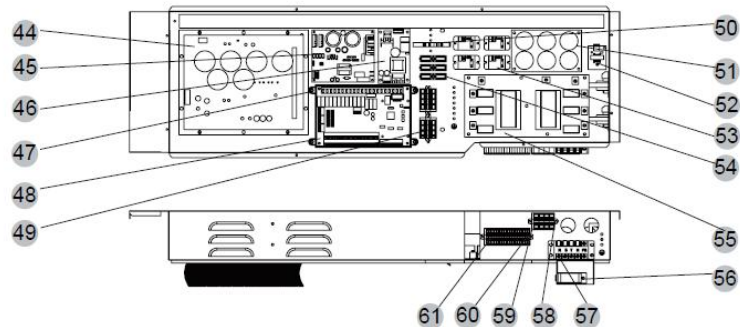
No.	Part code	Part name	Qty
1	81500143	T-junction	4
2	20000-140453	T-junction	1
3	304030-00000002	T-junction	1
4	2000-1460	T-junction	1
5	2000-1435	T-junction	1
6	20000-120165	Plate heat exchanger	2
7	2004-1444	Filter	2
8	301100-00000015	Electronic expansion valve (R410A)	1
9	2001-1418	Four-way valve and its component	1
10	2002-1475	Check valve	4
11	81000043	Shut-off valve	1
12	20000-360060	Low pressure switch	1
13	81500450	Connector assembly 2	1
14	81500451	Connector assembly 3	1
15	20000-140512	Needle valve	1
16	20000-360110	High pressure switch	1
17	81500083	Connector assembly	1
18	80400057	Water pump	1
19	82500009	Reactor	1
20	20000-140150	Needle valve	1
21	80702609	Shut-off valve holder	1
22	80711920	Water pump support frame	1
23	80711926	Front right panel	1
24	20001-220001	Handle	1
25	80711928	Front net	1
26	20000-270004	Axial fan	1
27	20000-330132	DC fan motor	1
28	80807417	Wind deflector	1
29	80711927	Left net	1
30	80601313	(Under development) Finned-tube heat exchanger	1
31	80711929	Back net	1
32	80711916	Fan motor bracket assembly	1
33	80807415	Electric box	1
34	80711922	Electrical box cover	1
35	80711925	Top cover	1

Model and Code: CH-HP12UIMPRM (13110057)

A. Whole Unit Exploded Diagram



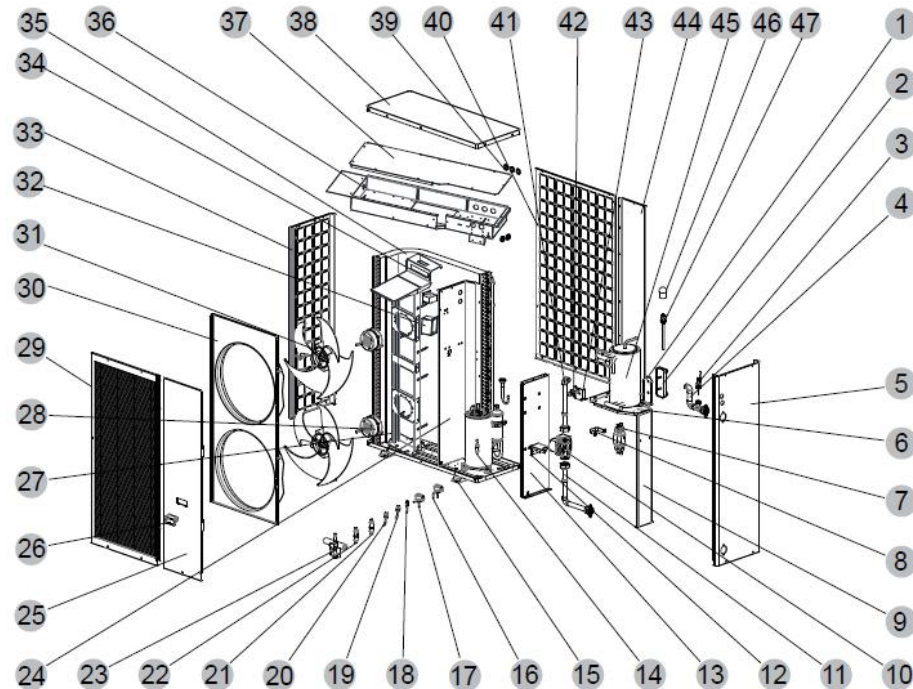
B. Electric Box Exploded Diagram



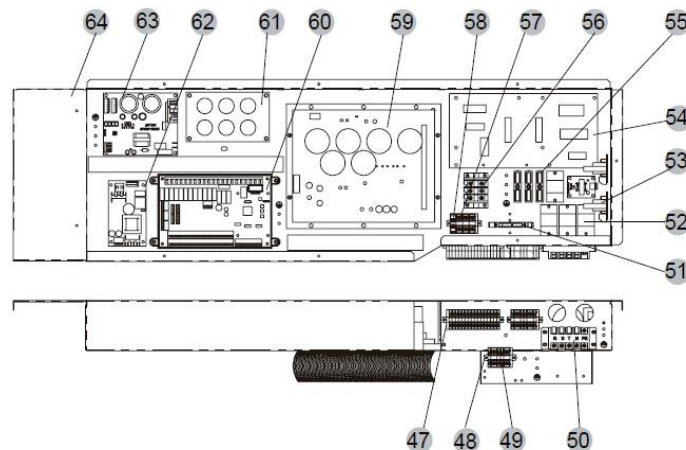
No.	Part code	Part name	Qty.
1	80600438	Tube-in-shell heat exchanger	1
2	80711947	Tube-in-shell heat exchanger support	1
3	80100089	Compressor	1
4	80711943	Right panel	1
5	81500448	Connector assembly	
6	81500449	Connector assembly	
7	20000-360005	Water flow switch	1
8	2004-1444	Filter	1
9	20000-140150	Needle valve	1
10	304030-00000003	T-junction	
11	2000-1460	T-junction	1
12	2000-1435	T-junction	1
13	20000-260125	Rubber fixed block	1
14	81000064	Electronic expansion valve	1
15	80711931	Chassis	1
16	81500143	T-junction	1
17	81000043	Shut-off valve 3/8"	1
18	2002-1475	Check valve	1
19	2004-1437	Four-way valve and its component	4
20	301100-00000015	Electronic expansion valve	1
21	20000-360060	Low pressure switch	4
22	2001-3605	High pressure switch	1
23	80400045	Water pump	1
24	80711945	Water pump support frame	1
25	80711944	Front right panel	1
26	20001-220001	Handle	1
27	80711935	Middle partition	1
28	20000-120165	Plate heat exchanger	1
29	80711939	Front net	1
30	20000-270004	Axial fan blade	1
31	80711936	Wind deflector	1
32	20000-330132	DC fan motor	1
33	80711932	Fan motor bracket assembly	1
34	80702838	Reactor protective cover	1
35	82500009	Reactor	1
36	80711938	Left net	1
37	80601312	(Under development) Finned-tube heat	1

Model and Code: CH-HP20UIMPRM (13130086)

A. Whole Unit Exploded Diagram



B. Electric Box Exploded Diagram

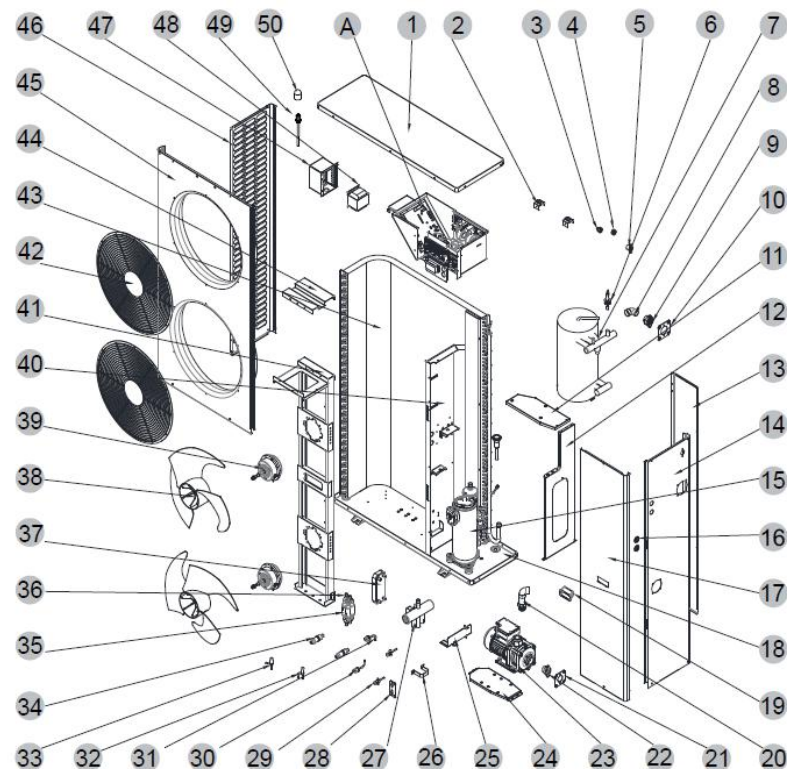


No.	Part code	Part name	Qty.
1	80701371	Plate heat exchanger bracket	1
2	20000-120170	Plate heat exchanger	1
3	20000-360005	Water flow switch (open mold)	1
4	81500046	Outlet pipe	1
5	80705201	Right panel	1
6	80701429	Tube-in-shell heat exchanger bracket	1
7	/	Check valve component	1
8	301990-00000005	Check valve component fixing clip	1
9	35036-210288	Tube-in-shell heat exchanger bracket plate	1
10	20000-330234	Water pump (GRUNDFOS)	1
11	81500047	Inlet pipe	1
12	80701368	Water pump bracket	1
13	35036-210283	Water pump bracket	1
14	80100036	Compressor and its component (P67)	1
15	80705252	Chassis component	1
16	81000037	Electronic expansion valve	1
17	81000024	Electronic expansion valve (R410A)	1
18	20000-140150	Needle valve	1
19	20000-360060	Low pressure switch	1
20	2001-3605	High pressure switch	1
21	20000-140027	Filter (R410A)	1
22	2004-1444	Filter (R410A)	1
23	2001-1491	Four-way valve and its component	1
24	80705204	Middle partition component	1
25	35036-210279	Front right panel	1
26	20001-220001	Handle	1
27	80705205	Fan motor bracket	1
28	35036-210267	DC fan motor	1
29	80705200	Front net	2
30	80705202	Wind deflector	2
31	35036-210277	Axial fan blade	1
32	80702879	Reactor protective cover	1
33	80702222	Left net	1
34	82500009	Reactor	1
35	80600194	Finned-tube heat exchanger	1
36	20000-260115	Oval rubber cover (black)	2

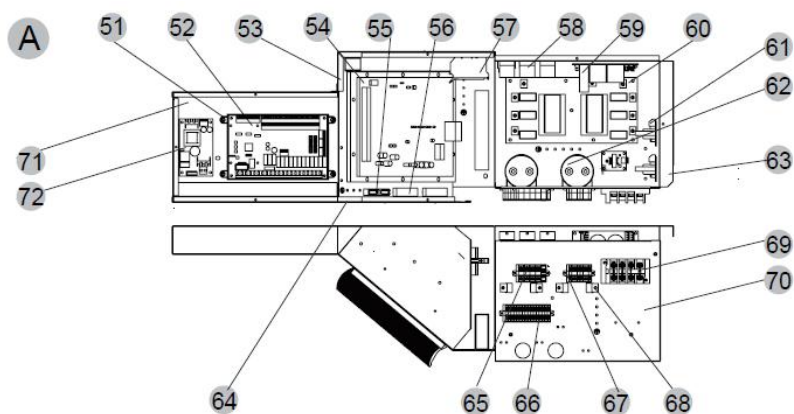
37	80705206	Electrical box cover	1
38	80702221	Top cover	1
39	20000-260004	Round rubber cover (black)	7
40	80705199	Back net	1
41	81500048	Inlet pipe 1	1
42	81000043	Shut-off valve 3/8"	1
43	80701428	Shut-off valve fixing plate	1
44	35010-210198	Back panel	1
45	80600208	Tube-in-shell heat exchanger	1
46	20000-360274	Pressure sensor	1
47	20000-140512	Needle valve	1
48	20000-390047	Terminal board	4
49	20000-390049	Terminal	3
50	20000-390046	Terminal	20
51	20000-390180	5-position terminal block	1
52	20000-390077	Insurance terminal	1
53	20000-360297	Relay	4
54	20000-430215	MXL215 hardware three-dimensional diagram	3
55	82300074	Inverter three-phase filter board	1
56	2000-3909	2-position terminal block	3
57	20000-390223	3-position terminal block	1
58	20000-390048	Terminal	7
59	20000-390045	Terminal	1
60	302010-00000012	Driver Module	1
61	82300075	PC4002	1
62	302010-00000014	Inverter capacitor board	1
63	82600018	Switching power supply module	1
64	20000-430169	MXL169 hardware three-dimensional diagram	1
65	80712220	Electric box components	1

Model and Code: CH-HP24UIMPRM (13190001) A.

Whole Unit Exploded Diagram

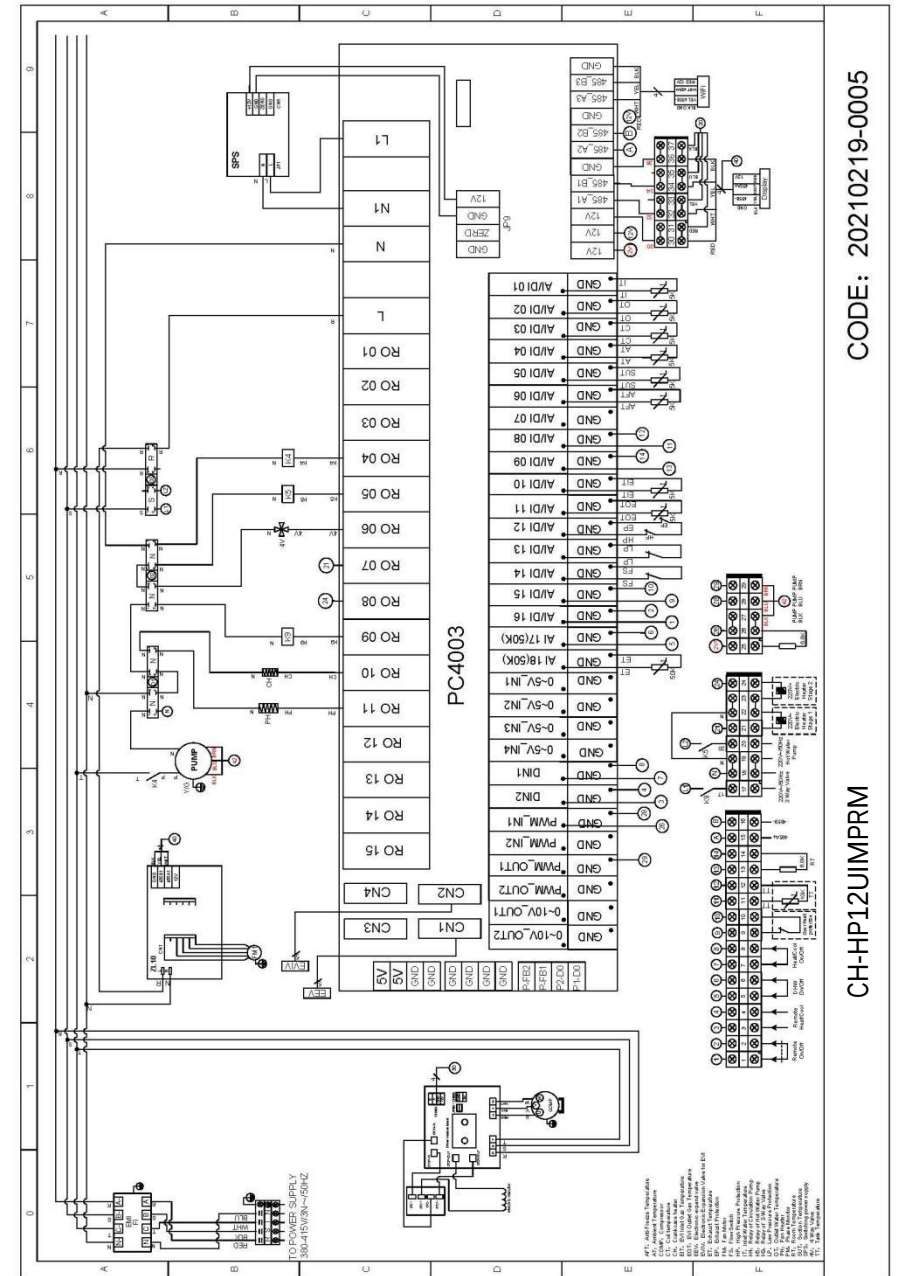
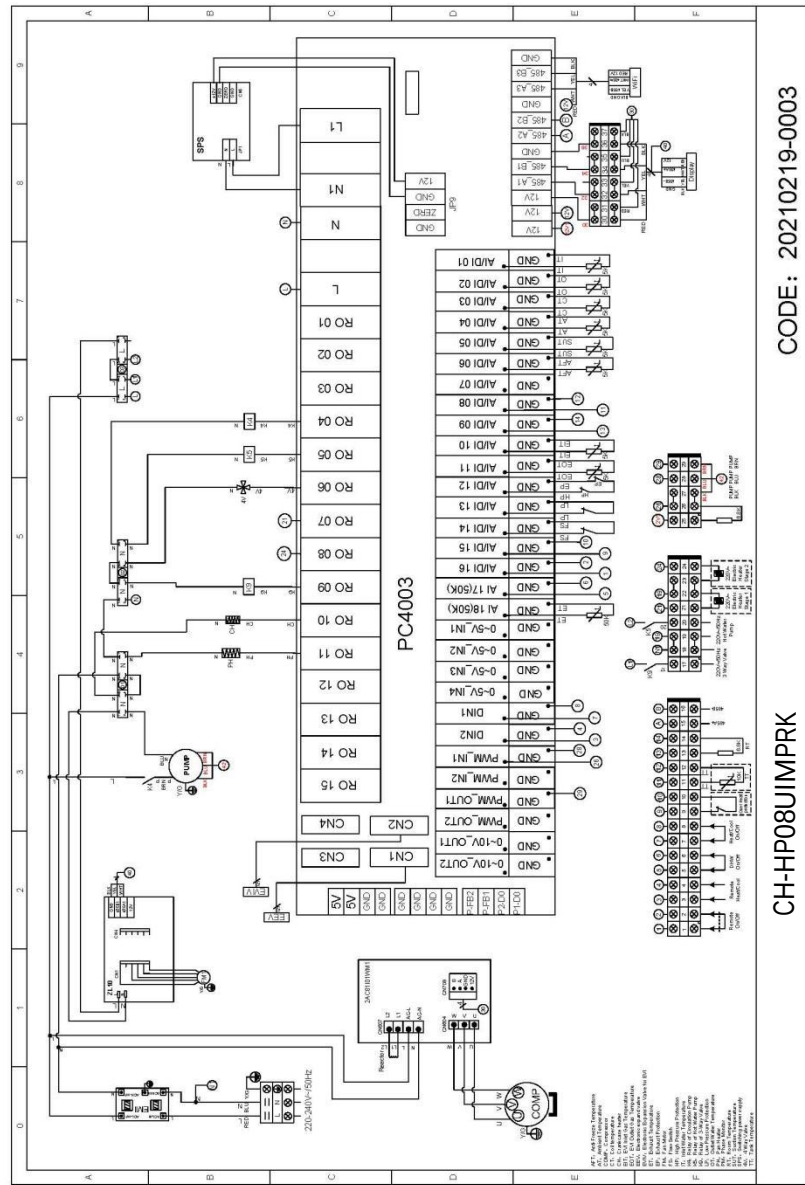


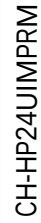
B. Electric Box Exploded Diagram



No.	Part code	Part name	Qty.
1	80707166	Top cover	1
2	20000-210367	Finned-tube heat exchanger fixing plate	2
3	40000-130030	Nut	1
4	20000-770003	Spring	1
5	301150-00000014	Connector	1
6	20000-360263	Water flow switch	1
7	80600390	Tube-in-shell heat exchanger	1
8	20000-130517	90° elbow	1
9	20000-130492	Connector	1
10	80703105	Nozzle plate	1
11	80703116	Tube-in-shell heat exchanger base	1
12	80703100	Tube-in-shell heat exchanger support frame	1
13	80707165	Back panel	1
14	80707098	Right panel	1
15	80100136	Compressor	1
16	20000-260004	Round rubber cover (black)	4
17	80707164	Front right panel	1
18	80707093	Chassis component	1
19	20001-220001	Handle	1
20	81500119	Outlet pipe	1
21	80702836	Nozzle plate	1
22	20000-130352	Connector	1
23	20000-330070	Water pump (GRUNDFOS)	1
24	80706718	Water pump base	1
25	80703104	Four-way valve holder	1
26	301990-00000005	Check valve component fixing clip	1
27	81000077	Four-way valve and its component	1
28	80703103	Needle valve fixing plate	1
29	20000-140353	Needle valve	2
30	2001-3605	High pressure switch	1
31	20000-360060	Low pressure switch	1
32	81000041	Electronic expansion valve	1
33	81000037	Electronic expansion valve	1
34	20000-140027	Filter (R410A)	2
35	2001-1497	Check valve	4
36	20000-140783	T-junction	4

37	20000-120170	Plate heat exchanger	1
38	301030-00000003	Axial fan blade	2
39	20000-330309	DC fan motor	2
40	80707642	Middle partition component	1
41	80707643	Motor bracket component	1
42	80702808	Fan guard net	2
43	80600810	Finned-tube heat exchanger	1
44	80707967	Fan motor bracket fixing beam	1
45	80707095	Wind deflector	1
46	80707097	Left net	1
47	80701369	Reactor protective cover	1
48	82500008	Reactor	1
49	20000-360274	Pressure sensor	1
50	20000-140512	Needle valve	1
A	/	Electrical components	1
51	80900483	Plastic base	1
52	82300075	PC4003	1
53	80807766	Electrical box rear baffle	1
54	302010-00000012	Driver module	1
55	2000-3909	2-position terminal block	4
56	20000-320140	Equalizing cement resistance	2
57	20000-390077	Insurance terminal	1
58	20000-360297	Relay	4
59	20000-430228	ZL10 V3	1
60	82300148	Inverter three-phase filter board	1
61	20000-430215	BHB21	1
62	20000-350026	Inverter capacitor	2
63	80807765	The right component of the electric box	1
64	80807767	Front bezel of electric box	1
65	20000-390048	Terminal	6
66	20000-390046	Terminal	18
67	20000-390047	Terminal board	3
68	20000-210324	Capacitor clamp (180°C)	2
69	20000-390238	4-position terminal block	1
70	80712421	Power installation board	1
71	80807764	Left part of electric box	1
72	82600018	Switching power supply module	1

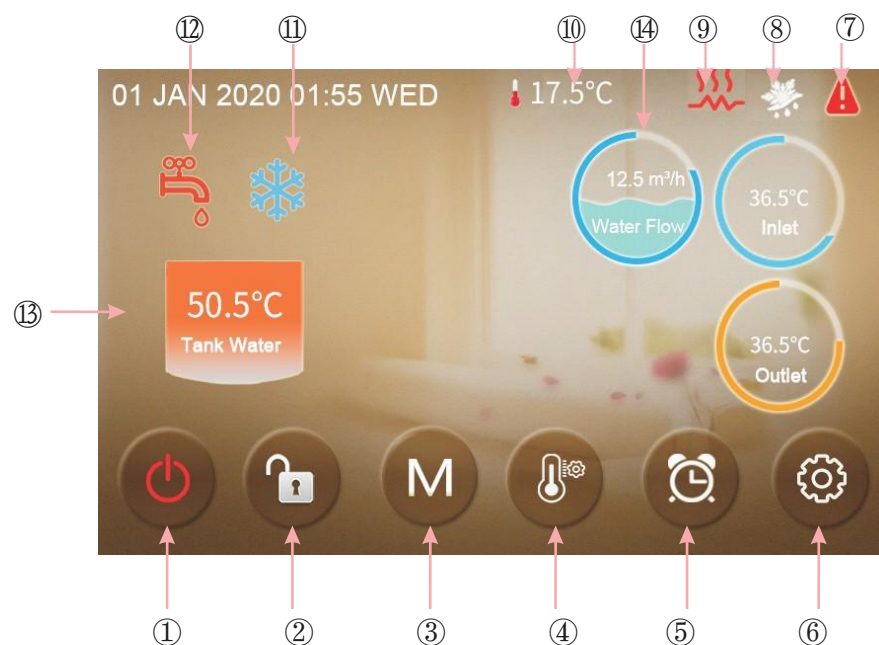




12. Display Operation Guide

12.1. Main Interface Display and Function

(1) Power on Interface

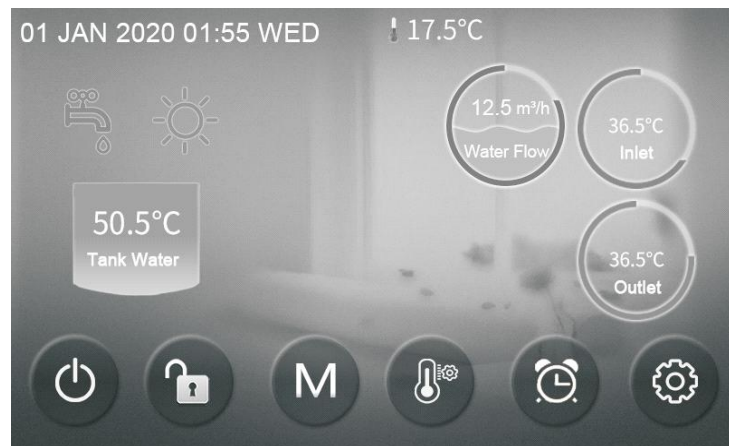


Key No.	Key Name	Key Function
①	ON/OFF	Switch the unit ON or OFF. Red represents ON, while grey represents OFF.
②	Lock Screen	Lock the screen. White represents disabled, while green represents enabled.
③	Running Mode	Switch Hot water mode, heating mode, cooling mode, hot water + heating mode or hot water + cooling mode
④	Temperature Setting	Set the target temperature.
⑤	Timer Setting	Set the timer. White represents disabled, while green represents enabled.
⑥	Setup	Check the unit status, time, factory parameter, temperature curve, timer setting and mute setting.
⑦	Fault	This icon will flash when there is an error showing up. The display will enter fault record interface after tapping this icon.
⑧	Defrosting	The unit is in defrosting mode when this icon shows up.
⑨	Electric Heater	The unit is in electric heater mode when this icon shows up.
⑩	Ambient Temperature	It shows the current ambient temperature.
⑪	Cooling Mode	The unit is in cooling mode when this icon shows up.
⑫	Hot Water Mode	The unit is in hot water mode when this icon shows up.
⑬	Tank Water Temperature	The unit is in hot water mode when this icon shows up; Otherwise, this icon is not shown.
⑭	Water Flow (Only available for some models. Will be available for all before Dec. 2021)	It shows the current water flow (note: When H31=0, the icon is not displayed).

12.2. ON/OFF

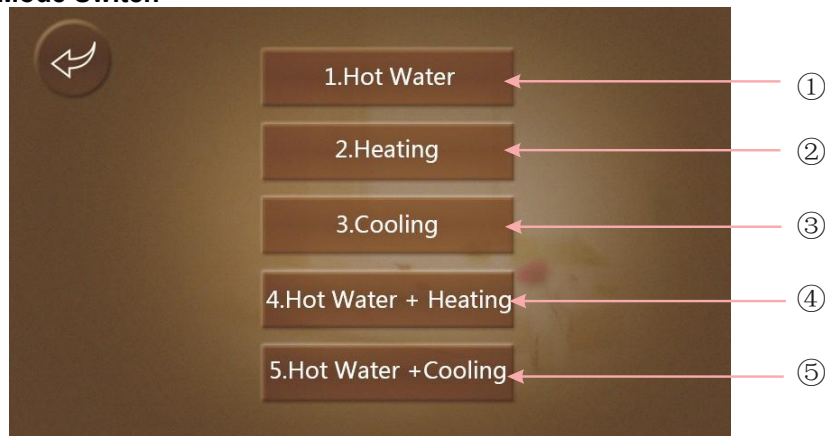
As the main interface shows

(1) In the shutting down interface (on/off key is in grey status), press the on/off key can start up the machine.



(2) Note: In starting up interface (on/off key is in red status), press the on/off key can shut down the machine.

12.3. Mode Switch



In the main interface, there are five modes that can be selected after tapping the mode key.

(1)tapping hot water mode icon ①, then the display will change to this mode's interface;

(2)tapping heating mode icon ②, then the display will enter this mode's interface;

(3)tapping cooling mode icon ③, then the display will switch to this mode's interface;

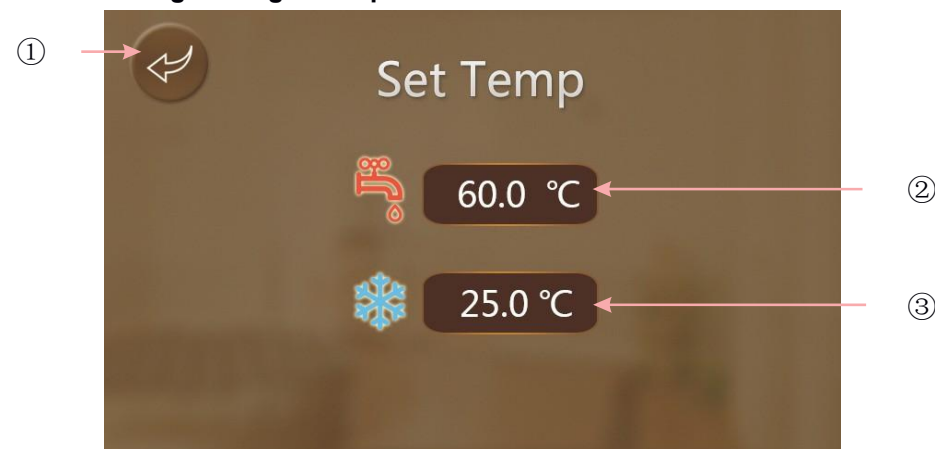
(4)tapping hot water + heating mode icon ④, then the display will go into the hot

water + heating mode's interface;

(5)tapping hot water + cooling mode icon ⑤, then the display will come to the hot water + cooling mode's interface;

Note: If your unit is a heating-only model (without a cooling function), the "cooling" key will show on the interface.

12.4. The setting of Target Temperature



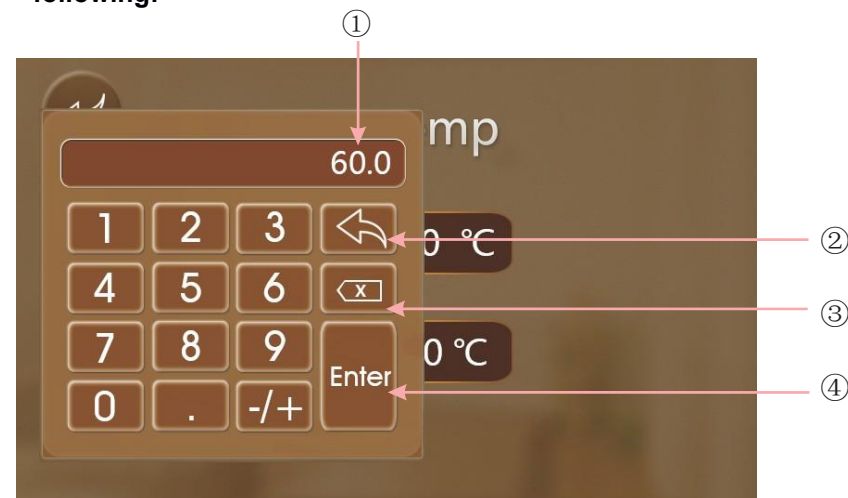
Take hot water + cooling mode for example:

Tapping ①, the wire controller will back to the main interface;

Tapping ②, the target temp of hot water can be set by the pop-up keyboard;

Tapping ③, the target temp of cooling mode can be set by the pop-up keyboard.

12.5. When the target temp is being set, the pop-up keyboard is shown as following:

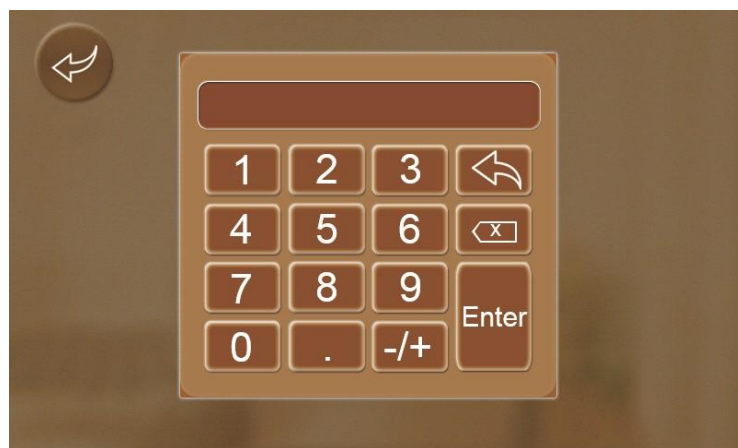


Key No.	Key Name	Key Function
②	Return key	Tapping this key can back to the main interface.
③	Delete key	Tapping this key to undo the last action.
④	Enter key	Tapping this key can save you action and back to the main interface.

Note: ① means the new target temp under the current setting

12.6. Unlock Screen

Click the lock screen key again while the screen has been locked, the pop-up keyboard is shown as following:



Note: Input the password of 22 or 022 and click the enter key, the screen will be unlocked.

12.7. Timer Setting

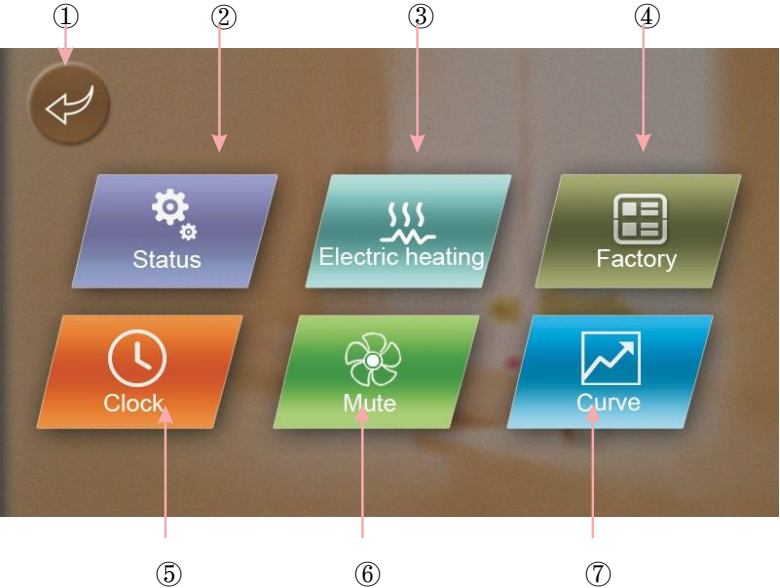
Click the timer setting key to enter the timer setting, the interface display is as follows:



Key No.	Key name	Key color	Key function
①	Return key		Click this key to return to the main interface.
②	Enable the timer on/off	Enable: Green ON Disable: Gray OFF	Click this key to start or turn off the timed function
③	Enable the timer off	Enable: Red ON Disable: Gray OFF	Click this key to start or turn off the timed shutdown function
④	Hour of timer on		Click this button to set the timing boot time
⑤	Hour of timer off		Click this button to set the scheduled shutdown time
⑥	Page left		Click this button to turn the page left
⑦	Page right		Click this button to turn page right

12.8. Setup

Click the setup key to enter the setup and the interface display is shown as follows:



Key No.	Key Name	Key Function
①	Return key	Click this key to return to the main interface.
②	Operating mode	Click this key to view the current operating parameters of the unit.
③	Electric heating	Click this key to turn on the unit Electric heating.
④	Factory parameter	Click the key and enter the password to enter the factory parameter settings and status parameters interface.
⑤	System time setting	Click this key to set the system time.
⑥	Mute setting	Click this key to set the unit mute function mode.
⑦	Curve key	Click this key to view the temperature curve.

Note:

If the unit has ②, ⑥ or both functions, the corresponding icon will be displayed on the setting interface.

In the setup interface:

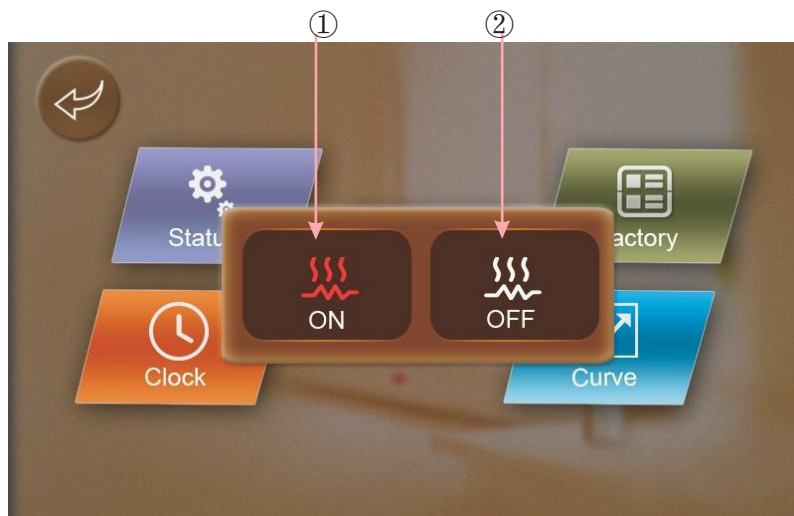
(1)Tapping operating mode button②, then the interface display is shown as follows:

(2)Tapping system time setting button⑤, then the interface display is shown as follows:



Key No.	Key Name	Key Function
①	Return key	Click this key to return to the setup interface.
②	Up key	Click this key to increase the value.
③	Down key	Click this key to decrease the value.
④	Cannel key	Click this key to cancel the current settings and return to the settings page.
⑤	Enter key	Click this key to save the current settings.

(3) Tapping Electric heating button③, then the interface display is shown as follows:



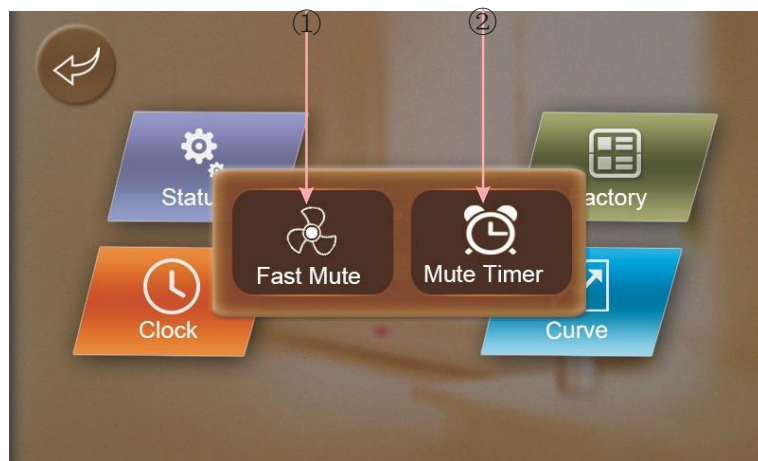
Note:

When the unit starts the electric heating, the icon is displayed as ①; When the unit closes the electric heating, the icon is displayed as ②;

While the unit is in cooling mode, clicking the icon ①, the electric heating will not be turned on;

While the unit is in hot water + cooling mode, if the hot water side is running, the electric heating will be operated and shown; if the cooling side is running, clicking the icon ①, the electric heating will not be turned on.

(4) Tapping Mute setting button ⑥, then the interface display is shown as follows:



displayed as ; When the unit is enabled to activate the powerful function, the icon ① is displayed as .

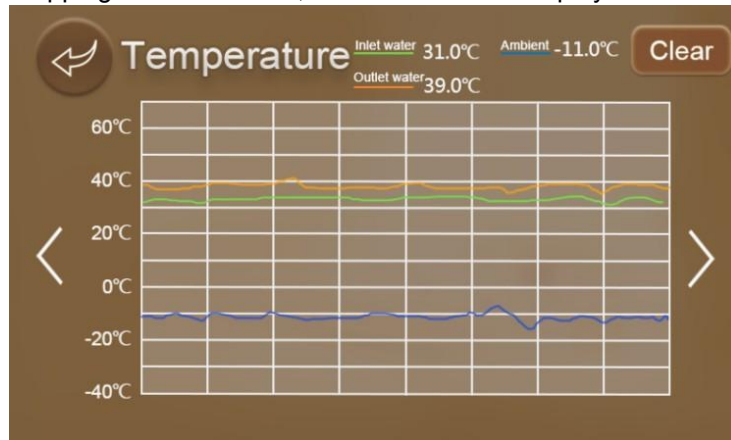
(4.1) Tapping Mute Timer button ②, then the interface display is shown as follows:



Key No.	Key Name	Key color	Key Function
①	Timing Mute Start Enabled	Enable: Green ON Disable: Gray OFF	Click this key to start or turn off the timed mute start enable
②	Timed mute end enabled	Enable: Red ON Disable: Gray OFF	Click this key to start or turn off the timed mute end enable
③	Timing mute start time		Click this button to set the timing mute start time
④	Timed mute end time		Click this button to set the timed mute end time

Note: When the unit is enabled to activate the mute function, the icon ① is

(5) Tapping Curve button⑦, then the interface display is shown as follows:

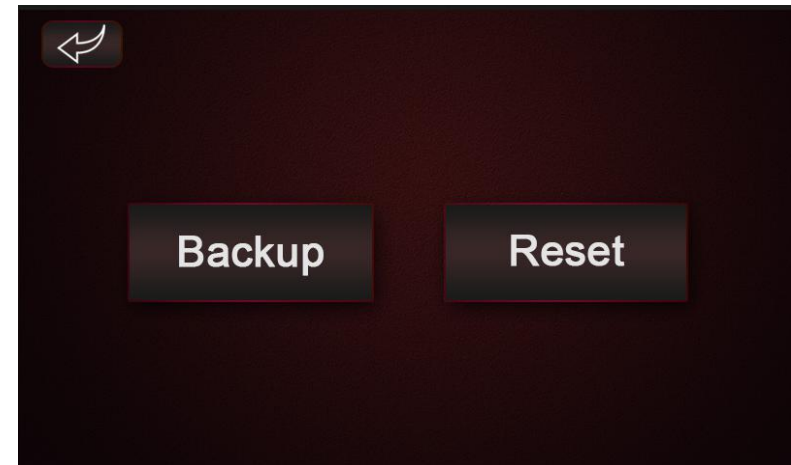


- This curve function records the water inlet temperature and water outlet temperature;
- Temperature data is collected every five minutes and the 12 sets of temperature data are saved every hour. Timekeeping is made from the latest data saving, if the power is disrupted when the time is less than 1 hour (12 sets), the data during such period will not be saved.
- Only curve for power-on status is recorded, and that for power-off will not be saved;
- The value of the abscissa indicates the time from the point on the curve to the current time point. The leftmost point on the first page (0 on the abscissa) is the latest temperature record;
- Temperature curve record is provided with power-down memory function.

12.9. Parameter backup and reset function

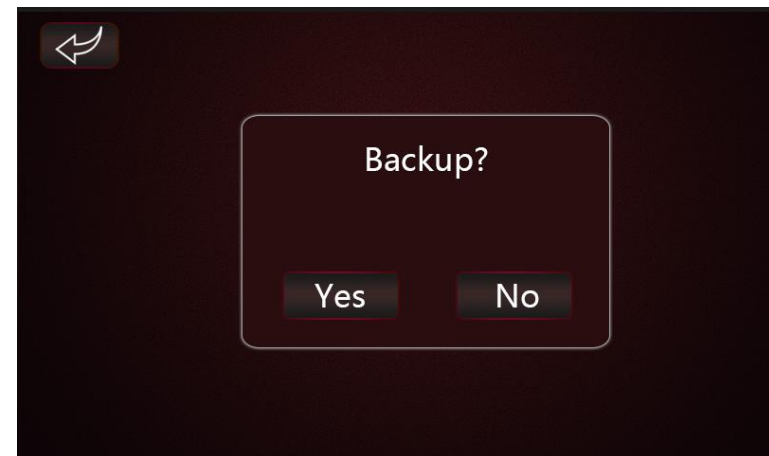
Input '855' to have the backup and reset function.

12.9.1. Backup and Reset Display

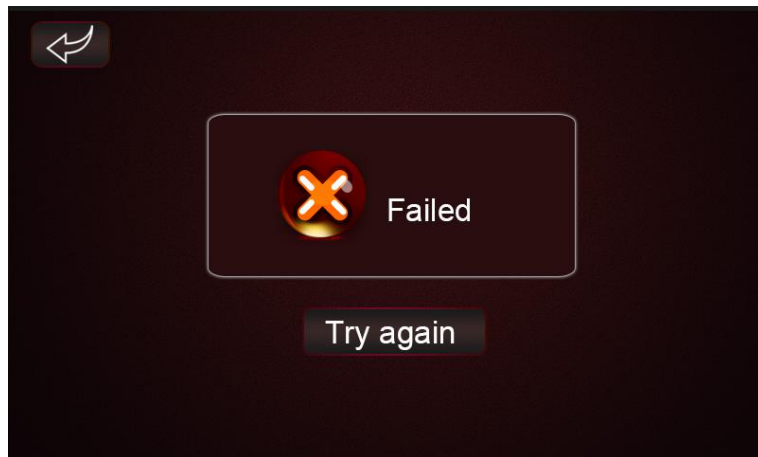
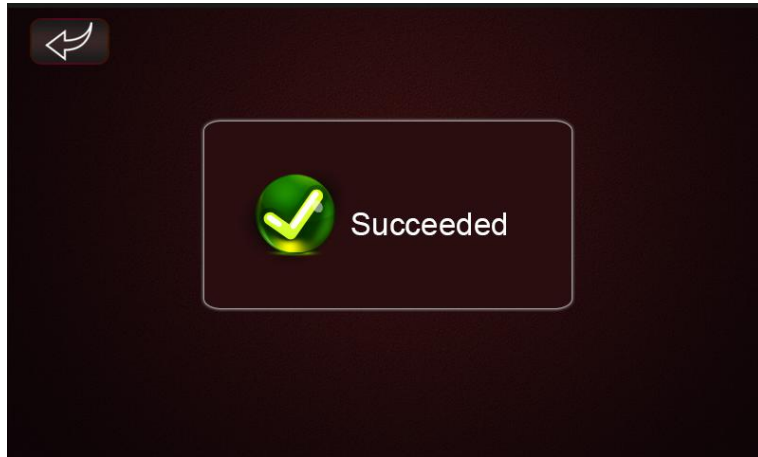


12.9.2. Parameter Backup

- (1) The backup function means that backup the mainboard parameter setting to the display for stock. This function only suggests for use during the unit production, which can back up the unit factory setting on the display for storage;
- (2) Push the "Backup" button, it can choose the yes or no to confirm the parameter backup;



(3) After the data have been successfully backup to the display, it will show as below, otherwise, it will show the “failed” reminder;



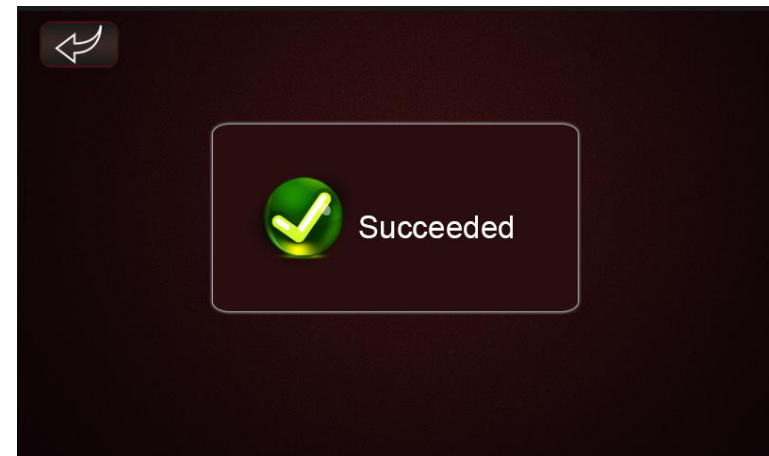
12.9.3. Parameter Reset

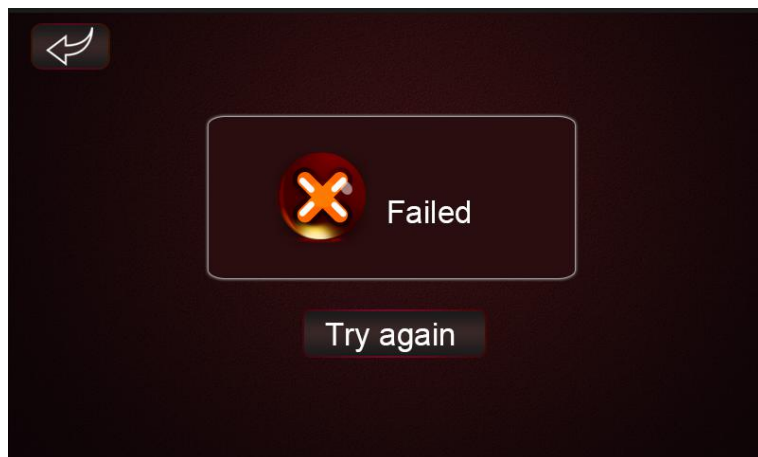
(1) The parameter reset means the reset the parameter according to the display backup parameter setting, if the unit only have done the backup function during the production, then the unit parameter reset can be reset the parameter to the factory setting;

(2) After pushing the “Reset” button, it will have below interface to choose the “Yes” or “No” to confirm whether to enable the reset function, during the parameter reset process, it will have the remind as “In recovery”, please do not have any operation during that time.



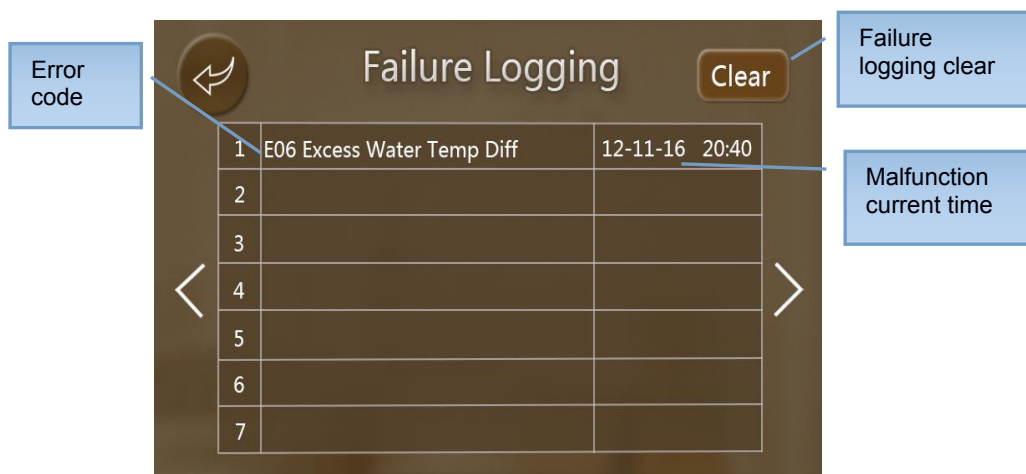
(3) After the data have been successfully reset from the display, it will show as below, otherwise, it will show the “failed” reminder;





Please pay attention to the parameter backup and reset operation, as different model units have different parameter setting, if the unit has replaced a new display that did not belong to this model, please backup the parameter settings to the display at first;

12.9.4. Failure Interface

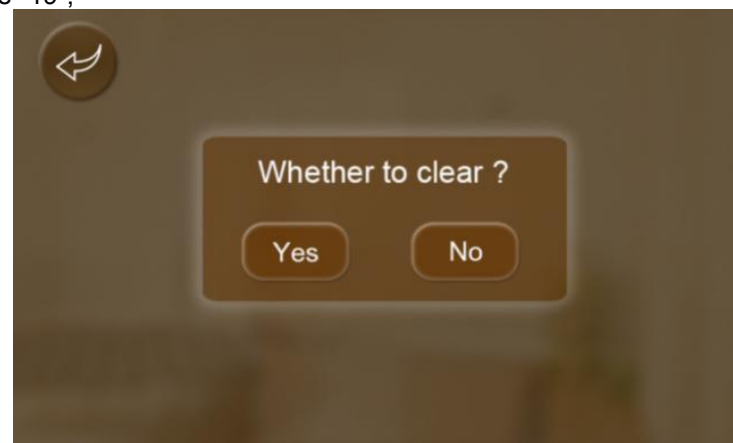


(1) When the unit get the alarm, it will have the alarm icon  on the main interface top right corner, click the icon then it will enter into the failure record interface.

(2) Failure record interface

(a) The failure record interface will have the failure code and failure name as well as the failure time;

(b) If it needs to clear the failure record, it needs to enter the password according to the display data, such as the display date is 19.06.2021, then the password should be "19";



(c) When choosing the "Yes" to clear the failure record, if the failure did not be resolved, the failure record will keep on the record interface also;

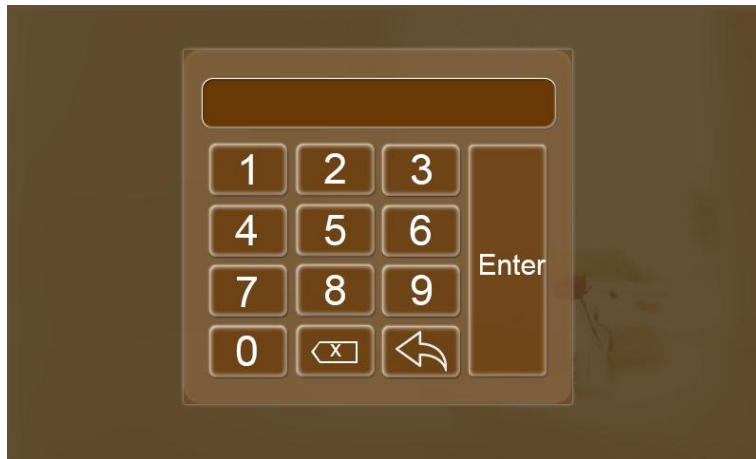
12.9.5. Locking Window Function

(1) When the main window has been locked, it will show as below:



(2) Unlock the mainboard window

Click the "lock" key to unlock the window, it needs to input the password 22 or 022;



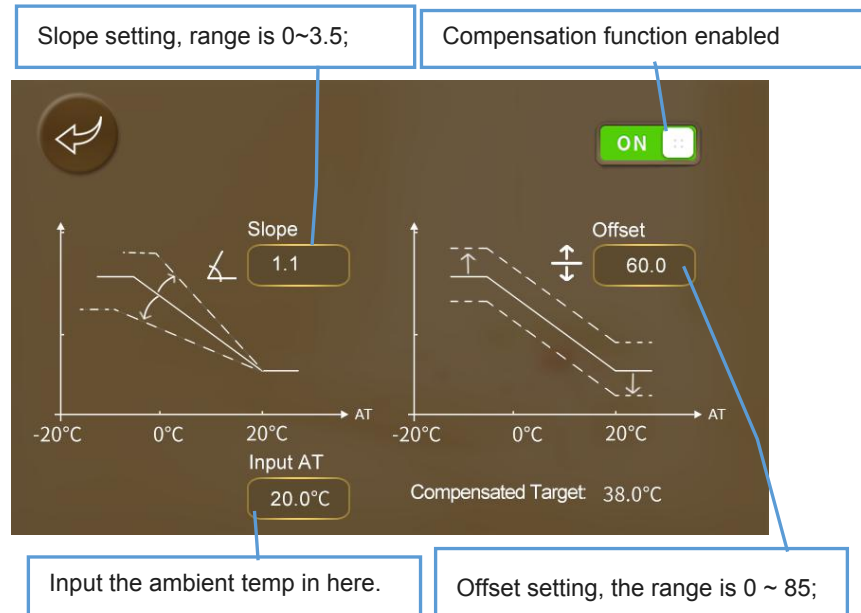
12.9.6. Weather Compensation Function

It needs to set the “slope” and “offset” value according to the customer house heating demand;

Compensated target temp = - Slope*Current ambient temp + Offset;

When the house heating needs more energy only during the low ambient temp, then it should enlarge the “Slope” setting;

When the house heating needs more energy during the whole ambient temp range, then it should enlarge the “Slope” and “Offset” setting;



	Type	Parameter	Specification	Range	Default value	Remark
1	A System Protection	A03	Heat pump shutdown ambient temp	-30.0~10.0℃	-25℃	
2		A04	Antifreeze setting temp	-15.0~10.0℃	4℃	
3		A05	Antifreeze setting temp difference	1.0~50.0℃	3℃	
4		A06	Exhaust temp protect setting	60.0~130.0℃	120℃	
5		A11	Enable the suction pressure sensor	/	0	0-no 1-yes
5		A21	Ambient/Suction/Coil Sensor type	/	0	0-5K/1-2K
6		A22	Antifreeze min temp setting	-20℃~10℃	4℃	
7	H System Parameter	H01	Power loss memory	/	1	0-no memory/1-have memory
8		H05	Enable cool mode	/	1	0-no /1-yes
9		H07	Controller choice	/	0	0-display control/1-remote control
10		H10	Unit address	1~32	1	
11		H18	Electric heater energy stage	/	3	1-Electric heater stage 1 2-Electric heater stage 2 3-Electric heater stage 3
12		H20	3-way valve polarity	/	0	0-ON in hot water mode/1-OFF in hot water mode
13		H21	Temperature unit	/	0	0-℃/1-F
14		H22	Silence mode	/	1	0-no/1-yes
15		H25	Control temp choice when heat/cool mode	/	0	0-outlet water temp./1-room temp.
16		H27	EVI enabled	/	3	0-no EVI 1-EVI on cooling 2-EVI on heating 3-EVI both heating and cooling
17		H28	Hot water mode enabled	/	1	0-no/1-yes
18		H29	Model running parameter code	0~20	0	/
19		H30	Hydraulic module enabled	/	0	0-no,1-yes
20		H31	water pump type	/	0	0-not water flow function 1- Grundfos 25-75 2- Grundfos 25-105 3- Grundfos 25-125
21		H32	Force running time of DHW change to heating	1~300min	120 min	
22	C	C01	Compressor manual frequency	0~120Hz	0	

23	compressor parameter	C02	Compressor minimum frequency	20~60Hz	30	
24		C03	Compressor maximum frequency	30~120Hz	90	
25		C04	Compressor model selection	0~99	0	setting according to compressor type
26		C05	Compressor minimum frequency of low ambient temp. (Cooling)	0~60Hz	50	
27		C06	Compressor frequency control mode	1-120	1	
28		C07	Frequency resonance point 1	/	0	
29		C08	Frequency resonance point 2	/	0	
30		C09	Frequency resonance point 3	/	0	
31	F Fan	F01	Fan motor type	/	3	1-Double speed motor/3-DC fan motor
32		F02	Coil temp setting when fan high speed on cool mode	-15.0~60.0℃	50℃	
33		F03	Coil temp setting when fan low speed on cool mode	-15.0~60.0℃	10℃	
34		F05	Coil temp setting when fan high speed on heat mode	-15.0~60.0℃	10℃	
35		F06	Coil temp setting when fan low speed on heat mode	-15.0~60.0℃	20℃	
36		F10	Fan quantity	/	0	0-single/1-double
37		F18	Fan motor min Speed in cooling	300~1300	300r	
38		F19	Fan motor min Speed in Heating	300~1300	300r	
39		F21	Timer mute	/	0	0-no/1-yes
40		F22	Manual-control Fan Speed	/	0	0-no/1-yes
41		F23	DC fan rated speed	300~1300	600r	
42		F25	Cooling fan max speed	300~1300	700r	
43		F26	Heating fan max speed	300~1300	700r	
44	E Electronic Expansion Valve	E01	EEV1 EEV adjust mode	/	1	0-manual/1-auto
45		E02	EEV1 target superheat	-20.0~20.0℃	5℃	
46		E03	EEV1 EEV initial steps	0~500N	350	
47		E07	EEV min Steps	0~500N	100	
48		E08	Cooling initial Steps	0~500N	200	
49		E09	EV11: adjustment mode	/	1	0-manual/1-auto
50		E10	EV11: initial steps	0~500N	350N	

51		E13	EVI target superheat	-20.0~20.0℃	3℃	
52		E14	EVI: min steps	0~500N	100N	
53		E17	Defrost steps	10~500N	480	
54		E18	Target superheat for cooling	-20.0~20.0℃	3℃	
55	D Defrosting	D01	Start defrosting setpoint	-30~5.0℃	-7℃	
56		D02	Exit defrosting setpoint	0.0~30.0℃	13℃	
57		D03	Defrosting cycle	30~90Min	45min	
58		D04	Max defrosting time	1~12 Min	8min	
59		D07	Electric heater control	/	1	0-no/1-yes
60		D08	Sliding defrost ambient temp	-30~10.0℃	2℃	
61		D09	Sliding defrost:ambient temp difference	1~50.0℃	14℃	
62		D10	Sliding defrost:coil temp difference	1~50.0℃	10℃	
63		D11	Sliding defrost:min coil temp	-30.0~50.0℃	-18℃	
64		D12	Defrosting compressor frequency	30~90Hz	70Hz	
65	R Temperature Parameter	R01	Hot water target temp	R36-R37	55℃	
66		R02	Heating target temp	R10~R11	45℃	
67		R03	Cooling target temp	R08~R09	7℃	
68		R04	Heating restart difference	0~10℃	2℃	
69		R05	Heating constant temp downtime difference	0~10℃	1℃	
70		R06	Cooling restart difference	0.0~10.0℃	2℃	
71		R07	Cooling constant temp downtime difference	0.0~10.0℃	1℃	
72		R08	Min cooling setpoint	-30.0~80.0℃	5℃	
73		R09	Max cooling setpoint	-30.0~80.0℃	28℃	
74		R10	Min heating setpoint	-30.0~99.0℃	15℃	
75		R11	Max heating setpoint	-30.0~99.0℃	60℃	
76		R15	Exiting outlet water high temp difference	0~15℃	2℃	
77		R16	Hot water restart difference	0~10℃	5℃	
78	R Temperature Parameter	R17	Hot water constant temp downtime difference	0~10℃	2℃	
79		R29	Heating compensation-on low ambient temp	-35~4℃	-5℃	

80		R30	Heating compensation-off low ambient temp	-35~4℃	-23℃	
81		R31	Low-AT max-compensation aim	20~60℃	40℃	
82		R32	Hot water compensation-on high ambient temp	10~60℃	55℃	
83		R33	Hot water compensation-off high ambient temp	10~60℃	55℃	
84		R34	Hot water compensation-on high ambient temp target temp	20~60℃	45℃	
85		R35	Electric heater functions	/	0	0-no use/1-water line electric heater /2-water tank electric heater
86		R36	Min hot water setpoint	0~75℃	15℃	
87		R37	Max hot water setpoint	0~75℃	58℃	
88		R39	Heating mode auto restart ambient temp	5~20℃	10℃	
89		R40	Ambient temp of water pump running	-10~60℃	55℃	
90		R41	Ambient temp of hot water pump running	-10~60℃	55℃	
91		R42	Max water heating temp.	20~60℃	55℃	
92		R43	Max water heating temp. (Under Low Temp.)	20~60℃	50℃	
93		R44	Max Water heating temp. (Under High Temp.)	20~60℃	40℃	
94		R45	Electric heater starts (No Delay) ambient temp)	-50~20℃	-10℃	
95		R46	the temp restart difference of the outlet water overheat protection	0~15℃	2	
96	P Pump Parameter	P01	Water pump running mode	/	2	0-Normal/1-Economic/2-Interval
97		P02	Water pump running interval time	1~120min	30 Min	/
98		P03	Water pump running duration	1~30min	3 Min	/
		P05	Hot water pump working mode	/	2	0-Normal/1-Economic/2-Interval
99		P06	Manual control water pump during the off mode	/	0	0-no,1-yes
100	G Sterilize Parameter	G01	Sterilize target temp	60~70℃	63℃	/
101		G02	Sterilize maintain time	0~60min	0min	/
102		G03	Sterilize start time	0~23h	1:00	/
103		G04	Sterilize cycle	1~30days	30	/
104		G05	Sterilize function	/	1	0-no/1-yes

	Possible cause	Related components	Solution
Unit tripped when powered on	Short circuit	Terminals Relays Contactors cables	Check all the components' connection Check relays and contactors whether are broken Disconnect the electronic components one by one and powered on to find the problem
Display cannot get power	Cables has disconnected The power input cable is misconnected	Display cable Power input cable	Check the display cable Check the power cable Check the 3-phase power cable whether connected in right phase sequence
cannot start up the unit	The unit have error Cables has disconnected	Display Cables	Check the display whether shown error Check the cable Reconnect the power cable and check if it works
Display cannot work	The display has been locked The display is broken	Display	Check the display whether shown locked icon Check the cable Reconnect the power cable and check if it works
Heating effect is not good	The compressor running low frequency The fan is not running or speed is too low Leakage problem	Compressor Fan Refrigerant system	Check the compressor frequency Check the fan speed Check the exhaust temperature and low pressure
Shut off while didn't reach the target temperature	Temperature limit (according to ambient temperature)	Control logic	Check the parameters
The evaporator has too much frost and cannot defrosting cleanly	Fan blade or motor issue EEV step is not suitable Refrigerant amount issue Parameters issue	Parameters Fan EEV Refrigerant system	Check the defrosting parameters Check the compressor frequency Check the fan speed Check the exhaust temperature and low pressure
Abnormal noise	Screws issue Fan blade or motor issue Compressor issue Components have collision	Screws Fan Compressor Other components (tubes, cables)	Check the screws Check the fan blade and motor Check the compressor Check other components

	Error name	Relevant parts information	Review and resolve
E04	Electric heater overheat Protection		1. Check the Electrical heating Overheat protector open or not. 2. Check the Electrical heater.
E08	Communication failure between PCB and display	Communication error between PCB and DISPLAY	1. Check cable connection of PCB and DISPLAY. 2. Check the software version of PCB and DISPLAY.
E11	HP Protection	HP switch is open	1. Check whether showing the error after unit shutdown. 2. Measure the discharge pressure when unit is running. 3. Detect EEV step, suction pressure, inlet/outlet water discharge and suction temp. 4. Release all the gas of the system and refill refrigerant according to the nameplate.
E12	LP Protection	LP switch is open	1. Check whether showing the error after unit shutdown. 2. Measure the suction pressure when unit is running. 3. Detect EEV step, discharge pressure, inlet/outlet water discharge and suction temp. 4. Release all the gas of the system and refill refrigerant according to the nameplate.
E19	Primary Anti-freezing Protection	Ambient temp. $\leq 0^{\circ}\text{C}$, A04- 2°C $\leq$ water inlet $\leq$ A04 $^{\circ}\text{C}$	It is the protection in winter. Once the water temperature rises up to A04+ 4°C or the ambient temp is higher than 1, the error code disappears.
E29	Secondary Anti-freezing Protection	Ambient temp. $\leq 0^{\circ}\text{C}$, water inlet $\leq$ A04- 2°C	It is the protection in winter. Once the water temperature up to A04+ 11°C or the ambient temp is higher than 1, the error code disappears.
E19	Primary Anti-freezing Protection	Ambient temp. $\leq 0^{\circ}\text{C}$, $2^{\circ}\text{C} \leq$ water inlet $\leq 4^{\circ}\text{C}$	It is the protection in winter. Once the water temperature rises up to 8°C or the ambient temp is higher than 1°C , the error code disappears.
E29	Secondary Anti-freezing Protection	Ambient temp. $\leq 0^{\circ}\text{C}$, water inlet $\leq 2^{\circ}\text{C}$	It is the protection in winter. Once the water temperature up to 15°C or the ambient temp is higher than 1°C , the error code disappears.
E032	Flow Switch Protection	Flow switch is open	1. Detect the connection of cables. 2. Detect the flow switch. 3. Detect the water valve is opened or opened fully. 4. Detect the water pump and the filter. 5. Maybe there is some air in the water route.
E051	Compressor Overcurrent Shutdown Fault	Compressor Overcurrent	1. Check ambient temp. and inlet/outlet water temp.; 2. Turn on the unit. Record and analyze the changing process of high/low pressure, discharge/suction temp., EEV step, compressor frequency and running current. 3. If they are OK, replace a new compressor driver board.
E065	High water outlet temp. protection		Check if the water flow is too low and the outlet water whether too high
E081	Communication failure between PCB and fan drive board	Communication error between PCB and fan drive board	1. Check the connection between PCB and fan board. All of 12V-12V, GND-GND, A-A, B-B should be closed; 2. If they are closed, turn on the power, then measure the voltage between 12V and GND on fan board, if higher than 15V or lower than 7V, replace a new fan board.
E103	Fan motor overload protection		1. Check if the fan motor running well. 2. Detect the current of fan motor. 3. If the current is more than 1A, it means the motor have problem and need to replace a new one. 4. If the current is less than 1A, it means the motor control module have problem and need to replace a new one.

E171	Anti-freezing Protection	inlet water $\leq$ A04℃ and the antifreeze temp $\leq$ A04-A05 ℃	1. Check the water flow. 2. Check the outlet water temp sensor. 3. Measure the ambient temp. 4. Detect the connection of cables. 5. Check the record of defrosting, whether the defrosting time is too long or too often.
F01	Compressor activation failure		Restart the unit. 1. Check the changing process of EEV step, high pressure, low pressure, inlet/outlet water temp. 2. Check the connection of U/V/W between compressor and compressor driver board. 3. Check the compressor resistance. 4. Check compressor driver board.
F03	PFC Fault		Restart the unit. 1. Check the power supply connection and voltage supply is stable or not. 2. Replace a new compressor driver board.
F05	DC Bus Overvoltage		1. Check the voltage between DCP-IN and DCN-IN, if lower than 300V, the unit will get this protection. 2. Check the input voltage of R/S/T on compressor driver board, if lower than 210V, the unit will get this protection 3. If they are OK, please replace a new compressor driver board.
F06	DC Bus Undervoltage		1. Check the voltage between DCP-IN and DCN-IN, if lower than 300V, it will get this protection; 2. Check the input voltage of R/S/T on compressor driver board, if lower than 210V, it will get this protection; 3. If they are OK, please replace a new compressor driver board
F07	AC Input Undervoltage		1. Measure the input voltage of R/S/T of driver board, if lower than 300V, it will get this protection. 2. If it's OK, replace a new compressor driver board.
F08	AC Input Overcurrent		Only in single phase unit. Restart the unit. Check if there is electric leakage. If not, replace a new drive board.
F09	Input voltage sampling fault		1. Make sure power supply not lower than 300V or higher than 500V; 2. If it's OK, please replace a new compressor driver board.
F10	Communication Failure between DSP and PFC		Only in single phase unit. 1. Check the inverter board connection. 2. If no problem, replace a new compressor driver board.
F11	Communication Fault between DSP and Communication board		1. Please check the inverter board connection. 2. If no problem, please replace a new compressor driver board
F12	Communication failure between PCB and driver board		1. Check the connection between main control board and compressor driver board. All of 12V-12V, GND-GND, A-A, B-B should be closed. 2. If they are closed, turn on the power, then measure the voltage between 12V and GND on compressor driver board, if higher than 15V or lower than 7V, please replace a new one compressor driver board.

F13	IPM Overheat Stop		1. Check the fans are running or not. 2. Check the installation distance and space. 3. Leave enough distance and space to make heat pump have a good transfer heating condition. 4. Clean the finned heat exchanger. 5. If they are OK, replace a new compressor driver board.
F15	Input voltage Lacking Phase		1. Check the phase of power supply R/S/T to compressor driver board. 2. If it's OK, replace a new compressor driver board.
F16	Compressor weak magnetic protection alarm		1. Check the refrigeration system. 2. If it's OK, replace a new compressor driver board.
F17	Temperature fault of drive board		1. Check the connection of heat sink temp. sensor. 2. Check the resistance of heat sink temp. sensor. 3. If they are OK, please replace a new heat sink and heat sink temp. sensor.
F18	IPM Current Sampling Fault		1. Check ambient temp. and inlet/outlet water temp. 2. Check high/low pressure and discharge temp. and suction temp. 3. Check EEV step. 4. Check the compressor frequency and current. 5. If they are OK, replace a new compressor driver board.
F20	IGBT Power Device Overheat Alarm		1. Check the fans are running or not. 2. Check the installation distance and space. 3. If they are OK, please replace a new compressor driver board. 4. Leave enough distance and space to make heat pump have a good transfer heating condition. 5. Clean air to fin heat exchanger.
F22	AC input overcurrent protection alarm		Only in single phase unit. Restart the unit. 1. Check if there is electric leakage. 2. If still have the failure, replace a new drive board.
F23	EEPROM Fault Alarm		1. Check the connection; 2. Replace a new driver board;
F24	Destroyed EEPROM Activation Ban Alarm		
F25	LP 15V Underload Fault		1. Check the power supply is stable or not, and restart unit. 2. If the problem still on, please replace a new drive board.
F26	IGBT Power Device Overheat Fault		1. Check the fans are running or not ; 2. Check the installation distance and space; 3. Leave enough distance and space to make heat pump have a good transfer heating condition; 4. Clean the finned heat exchanger. 5. If they are OK, please replace a new driver board;
F031	DC Fan Motor 1 Failure		1. Turn off the unit and check the connection. 2. Restart and check if the motor is running normal or the error happens again. 3. Replace a new fan motor.
F032	DC Fan Motor 2 Failure		

Pp1	Exhaust Pressure Sensor Fault		1. Detect the exhaust pressure sensor connection 2. If the connection is OK, please replace a new one.
Pp2	Suction Pressure Sensor Fault		1. Detect the suction pressure sensor connection 2. If the connection is OK, please replace a new one.
TP	Low Ambient Temp. Protection	Ambient temp $\leq$ -30	1 Check the ambient temp 2. When ambient temp $\geq$ -28°C, the fault will disappear.
P01	Water Inlet Temp. Sensor Fault		1. Detect the connection. 2. Measure the resistance of sensor, if lower than 100Ω or higher than 500kΩ, please replace a new one.
P02	Water Outlet Temp. Sensor Fault		
P04	Ambient Temp. Sensor Fault		
P17	Water Outlet Temp. Sensor Fault		
P032	Hot Water Tank Temp. Sensor Fault		
P42	Room Temp. Sensor Fault		
P101	EVI Inlet Temp. Sensor Fault		
P102	EVI Outlet Temp. Sensor Fault		
P153	Coil Temp. Sensor Fault		
P181	Exhaust Temp. Sensor Fault		
P182	Exhaust Over Temp.	(Exhaust temp.) $\geq$ C05 default 110	1. Measure the resistance of sensor, if lower than 100Ω or higher than 500kΩ, please replace a new one. 2. Check the unit find if it has refrigerant leakage.
P191	Antifreeze Temp. Sensor Fault		1. Detect the connection 2. Measure the resistance of sensor, if lower than 100Ω or higher than 500kΩ, please replace a new one.

15. MODBUS RTU PROTOCOL

MODBUS RTU PROTOCOL

From: To:
Version V1.6 update: 2020/6/17

Baud Rate	9600bps
Start bit	1
Byte width	8
Parity	N
Stop bits	1
Slave address	H10 (Default as 1)

Address	Function	Data	CRC checksum
16bits	16bits 03: Function of reading multi registers 16: Function of presenting multi registers	N*16bits	16bits

Data Types	Description
TEMP	have symbol byte, 0.1°C resolution, formula: $T \times 10$, temperature range: -30~97°C (When the temperature show 25 °C, the protocol data transmission is 250; When the temperature show -25 °C, the protocol data transmission is -250 ; when bit15 is 1 represents the negative number, when the bit15 is 0, it represents Integer;), When the value is 32767, it represents the sensor failure
DIGI1	No symbol byte, unit :1, When show 123, the data transmission is 123;
DIGI2	No symbol byte, unit :10, When show 1230, the data transmission is 123;
DIGI3	No symbol byte, unit :100, When show 12300, the data transmission is 123;
DIGI4	No symbol byte, unit :5, When show 10, the data transmission is 2;
DIGI5	No symbol byte, unit :0.1, When show 12.3, the data transmission is 123;

DIGI6	No symbol byte, unit :0.001, When show 0.123,the data transmission is 123;
DIGI9	No symbol byte, unit :0.01, When show 0.12,the data transmission is 12;

Address	Function	Number	Content	mode	Default	Description	Remark
1011	03/16		ON/OFF	read/write		0-OFF/1-ON	DIGI1
1012	03/16		Mode	read/write		H05=1: 0-Hot water/1-Heating/2-Cooling/3-Hot water + heating/4-Hot water + Cooling H05=0: 0-Hot water/1-Heating/3-Hot water + heating	DIGI1
1013	03/16		Reserved	read/write			
1014	03/16		Reserved	read/write			
1015	03/16		Reserved	read/write			
1016	03/16		Manual control	read/write		bit0: Manual defrost(0-off 1-on) bit1: Mute flag bit (0-off 1-on) bit2: A key manual heating (0-off 1-on)	DIGI1
1017	03/16		Reserved	read/write			
1018	03/16	H01	if with disable automatic restart (0-no/1-yes)	read/write	1	0-no/1-yes	DIGI1
1019	03/16		Reserved	read/write			
1020	03/16		Reserved	read/write			
1021	03/16	H05	Cooling Mode	read/write	1	0-No/1-Yes	DIGI1
1022	03/16		Reserved	read/write			
1023	03/16	H07	Controller choice	read/write	0	0-display control 1-remote control	DIGI1
1024	03/16	H10	Unit address	read/write	1	1~32	DIGI1
1025	03/16		Reserved	read/write			
1026	03/16		Reserved	read/write			
1027	03/16	H27	EVI enabled	read/write	3	0-no EVI 1-EVI on cooling 2-EVI on heating 3-EVI both heating and cooling	DIGI1
1028	03/16	H28	Hot water mode enabled	read/write	1	0-no/1-yes	DIGI1

1029	03/16	H21	Temperature unit	read/write	0	0-°C/1-F	DIGI1
1030	03/16	H22	Silence mode	read/write	1	0-no/1-yes	DIGI1
1031	03/16		Reserved	read/write			
1032	03/16	H18	Electric heater energy stage	read/write	3	1-Electric heater stage 1 2-Electric heater stage 2 3-Electric heater stage 3	DIGI1
1033	03/16	H20	3-way valve polarity	read/write	0	0-ON on hot water mode/1-OFF on hot water mode	DIGI1
1034	03/16	H29	Model running parameter code	read/write	0	0~20	DIGI1
1035	03/16	H25	Control temp choice when heat/cool mode	read/write	0	0-outlet water temp./1-room temp.	DIGI1
1036	03/16	H30	Hydraulic module enabled	read/write	0	0-no,1-yes	
1037	03/16	A03	Heat pump shutdown ambient temp	read/write	-25°C	-40.0~10.0°C	TEMP1
1038	03/16	A04	Antifreeze setting temp	read/write	4°C	A22~10.0°C	TEMP1
1039	03/16	A05	Antifreeze setting temp difference	read/write	3°C	1.0~50.0°C	TEMP1
1040	03/16	A06	Exhaust temp protect setting	read/write	120°C	60.0~130.0°C	TEMP1
1041	03/16	H31	Water pump type	read/write	0	0-not water flow function 1- Grundfos 25-75 2- Grundfos 25-105 3- Grundfos 25-125	DIGI1
1042	03/16	A11	low pressure sensor enabled	read/write	0	0-no,1-yes	DIGI1
1043	03/16		Reserved	read/write			
1044	03/16		Reserved	read/write			
1045	03/16	H32	Force running time of DHW change to heating	read/write	120	1~180min	DIGI1
1046	03/16		Reserved	read/write			
1047	03/16		Reserved	read/write			
1048	03/16		Reserved	read/write			
1049	03/16		Reserved	read/write			
1050	03/16		Reserved	read/write			
1051	03/16		Reserved	read/write			
1052	03/16	A21	Ambient/Suction/Coil Sensor type	read/write	0	0-5K/1-2K	DIGI1
1053	03/16	A22	Antifreeze min temp setting	read/write	4°C	-20°C~10°C	TEMP1
1054	03/16		Reserved	read/write			

1055	03/16		Reserved	read/write			
1056	03/16		Reserved	read/write			
1057	03/16		Reserved	read/write			
1058	03/16		Reserved	read/write			
1059	03/16	F01	Fan motor type	read/write	3	1-Double speed motor/3-DC fan motor	DIGI1
1060	03/16	F02	Coil temp setting when fan high speed on cool mode	read/write	50°C	-15.0~60.0°C	TEMP1
1061	03/16		Reserved	read/write			
1062	03/16	F03	Coil temp setting when fan low speed on cool mode	read/write	10°C	-15.0~60.0°C	TEMP1
1063	03/16		Reserved	read/write			
1064	03/16		Reserved	read/write			
1065	03/16		Reserved	read/write			
1066	03/16	F05	Coil temp setting when fan high speed on heat mode	read/write	10°C	-15.0~60.0°C	TEMP1
1067	03/16		Reserved	read/write			
1068	03/16	F06	Coil temp setting when fan low speed on heat mode	read/write	20°C	-15.0~60.0°C	TEMP1
1069	03/16		Reserved	read/write			
1070	03/16		Reserved	read/write			
1071	03/16		Reserved	read/write			
1072	03/16		Reserved	read/write			
1073	03/16		Reserved	read/write			
1074	03/16	F10	Fan quantity	read/write	0	0-single/1-double	DIGI1
1075	03/16		Reserved	read/write			
1076	03/16		Reserved	read/write			
1077	03/16		Reserved	read/write			
1078	03/16		Reserved	read/write			
1079	03/16		Reserved	read/write			
1080	03/16		Reserved	read/write			
1081	03/16	F18	Fan motor min Speed in cooling	read/write	300r	300~1300	DIGI1
1082	03/16		Reserved	read/write			
1083	03/16	F19	Fan motor min Speed in Heating	read/write	300r	300~1300	DIGI1

1084	03/16		Reserved	read/write			
1085	03/16		Reserved	read/write			
1086	e	F21	Timer mute	read/write	0	0-no/1-yes	DIGI1
1087	03/16	F22	Manual-control Fan Speed	read/write	0	0-no/1-yes	DIGI1
1088	03/16		Reserved	read/write			
1089	03/16	F23	DC fan rated speed	read/write	600r	300~1300	DIGI1
1090	03/16		Reserved	read/write			
1101	03/16		Reserved	read/write			
1102	03/16		Reserved	read/write			
1103	03/16	F25	Cooling fan max speed	read/write	700r	300~1300	DIGI1
1104	03/16	F26	Heating fan max speed	read/write	700r	300~1300	DIGI1
1105	03/16		Reserved	read/write			
1106	03/16		Reserved	read/write			
1107	03/16		Reserved	read/write			
1108	03/16		Reserved	read/write			
1109	03/16		Reserved	read/write			
1110	03/16	D01	Start defrosting setpoint	read/write	-7°C	-30~5.0°C	TEMP1
1111	03/16		Reserved	read/write			
1112	03/16	D02	Exit defrosting setpoint	read/write	13°C	0.0~30.0°C	TEMP1
1113	03/16	D03	Defrosting cycle	read/write	45min	30~90Min	DIGI1
1114	03/16	D04	Max defrosting time	read/write	8min	1~12 Min	DIGI1
1115	03/16		Reserved	read/write			
1116	03/16	D07	Electric heater control	read/write	0	0-no/1-yes	DIGI1
1117	03/16	D08	Sliding defrost ambient temp	read/write	2°C	-30~10.0°C	TEMP1
1118	03/16	D09	Sliding defrost: ambient temp difference	read/write	14°C	1~50.0°C	TEMP1
1119	03/16	D10	Sliding defrost: coil temp difference	read/write	10°C	1~50.0°C	TEMP1
1120	03/16		Reserved	read/write			
1121	03/16	D11	Sliding defrost: in coil temp	read/write	-30°C	-30.0~50.0°C	TEMP1
1122	03/16		Reserved	read/write			

1123	03/16	D12	Defrosting compressor frequency	read/write	70	30~90Hz	DIGI1
1124	03/16		Reserved	read/write			
1125	03/16		Reserved	read/write			
1126	03/16		Reserved	read/write			
1127	03/16		Reserved	read/write			
1128	03/16		Reserved	read/write			
1129	03/16		Reserved	read/write			
1130	03/16		Reserved	read/write			
1131	03/16	E01	EEV1 EEV adjust mode	read/write	1	0-Manual/1-Auto	DIGI1
1132	03/16	E02	EEV1 target superheat	read/write	5	-20.0~20.0°C	TEMP1
1133	03/16	E03	EEV1 EEV initial steps	read/write	350	0~500N	DIGI1
1134	03/16		Reserved	read/write			
1135	03/16		Reserved	read/write			
1136	03/16		Reserved	read/write			
1137	03/16	E07	EEV min Steps	read/write	100	0~500N	DIGI1
1138	03/16	E08	Cooling initial Steps	read/write	200	0~500N	DIGI1
1139	03/16	E09	EVI1: adjustment mode	read/write	1	0-Manual/1-Auto	DIGI1
1140	03/16	E10	EVI1: initial steps	read/write	350	0~500N	DIGI1
1141	03/16		Reserved	read/write			
1142	03/16		Reserved	read/write			
1143	03/16	E13	EVI target superheat	read/write	3	-20.0~20.0°C	TEMP1
1144	03/16	E14	EVI: min steps	read/write	100	0~500N	DIGI1
1145	03/16		Reserved	read/write			
1146	03/16		Reserved	read/write			
1147	03/16	E17	Defrost steps	read/write	480	10~500N	DIGI1
1148	03/16	E18	Target superheat for cooling	read/write	3	-20.0~20.0°C	TEMP1
1149	03/16		Reserved	read/write			
1150	03/16		Reserved	read/write			
1151	03/16		Reserved	read/write			

1152	03/16	G01	Sterilize target temp	read/write	63	60~70°C	TEMP1
1153	03/16	G02	Sterilize maintain time	read/write	0	0~60min	DIGI1
1154	03/16	G03	Sterilize start time	read/write	1	0~23h	DIGI1
1155	03/16	G04	Sterilize cycle	read/write	30	1~30days	DIGI1
1156	03/16	G05	Sterilize function	read/write	1	0-no/1-yes	DIGI1
1157	03/16	R01	Hot water target temp	read/write	55	R36-R37	TEMP1
1158	03/16	R02	Heating target temp	read/write	45	R10~R11	TEMP1
1159	03/16	R03	Cooling target temp	read/write	7	R08~R09	TEMP1
1160	03/16	R04	Heating restart difference	read/write	2	0~10°C	TEMP1
1161	03/16	R05	Heating constant temp downtime difference	read/write	1	0~10°C	TEMP1
1162	03/16	R08	Min cooling setpoint	read/write	8	-30.0~R09°C	TEMP1
1163	03/16	R09	Max cooling setpoint	read/write	28	R08~80.0°C	TEMP1
1164	03/16	R10	Min heating setpoint	read/write	15	-30.0~99.0°C	TEMP1
1165	03/16	R11	Max heating setpoint	read/write	50	-30.0~99.0°C	TEMP1
1166	03/16	R15	Exiting outlet water high temp difference	read/write	2	0~15°C	TEMP1
1167	03/16	R29	Heating compensation-on low ambient temp	read/write	-5	-35~4°C	TEMP1
1168	03/16	R30	Heating compensation-off low ambient temp	read/write	-23	-35~4°C	TEMP1
1169	03/16	R31	Low-AT max-compensation aim	read/write	40	20~60°C	TEMP1
1170	03/16	R32	Hot water compensation-on high ambient temp	read/write	55	10~60°C	TEMP1
1171	03/16	R33	Hot water compensation-off high ambient temp	read/write	55	10~60°C	TEMP1
1172	03/16	R34	Hot water compensation-on high ambient temp target temp	read/write	45	20~60°C	TEMP1
1173	03/16	R35	Electric heater functions	read/write	0	0-no use/1-water line electric heater /2-water tank electric heater	DIGI1
1174	03/16	R06	Cooling restart difference	read/write	2	0.0~10.0°C	TEMP1
1175	03/16	R07	Cooling constant temp downtime difference	read/write	1	0.0~10.0°C	TEMP1
1176	03/16	R36	Min hot water setpoint	read/write	15	0~75°C	TEMP1
1177	03/16	R37	Max hot water setpoint	read/write	58	0~75°C	TEMP1
1178	03/16		Reserved	read/write			
1179	03/16		Reserved	read/write			

1180	03/16		Reserved	read/write			
1191	03/16		Reserved	read/write			
1192	03/16	R39	Heating mode auto restart ambient temp	read/write	10	5~20°C	TEMP1
1193	03/16	R40	Ambient temp of water pump running	read/write	2	-10~20°C	TEMP1
1194	03/16	R41	Ambient temp of hot water pump running	read/write	2	-10~20°C	TEMP1
1195	03/16	R16	Hot water restart difference	read/write	5	0~10°C	TEMP1
1196	03/16	R17	Hot water constant temp downtime difference	read/write	2	0~10°C	TEMP1
1197	03/16	P01	Water pump running mode	read/write	2	0-Normal/1-Economic/2-Interval	DIGI1
1198	03/16	P02	Water pump running interval time	read/write	30	1~120min	DIGI1
1199	03/16	P03	Water pump running duration	read/write	3	1~30min	DIGI1
1200	03/16		Reserved	read/write			
1201	03/16	P05	Hot water pump working mode	read/write	2	0-Normal/1-Economic/2-Interval	DIGI1
1202	03/16	P06	Water pump manual function	read/write	0	0-no,1-yes	
1203	03/16		Reserved	read/write			
1204	03/16		Reserved	read/write			
1205	03/16		Reserved	read/write			
1206	03/16		Timer function---start	read/write	0	0-NO/1-YES	DIGI1
1207	03/16		Timer function--hour start setting	read/write	0	0~23	DIGI1
1208	03/16		Timer function---closed	read/write	0	0-NO/1-YES	DIGI1
1209	03/16		Timer function--hour closed setting	read/write	0	0~23	DIGI1
1210	03/16		Timer function--minute start setting	read/write	0	00~59	DIGI1
1211	03/16		Timer function—minute closed setting	read/write	0	00~59	DIGI1
1218	03/16	C01	Compressor manual frequency	read/write	0	0~120Hz	DIGI1
1219	03/16	C02	Compressor minimum frequency	read/write	30	20~60Hz	DIGI1
1220	03/16	C03	Compressor maximum frequency	read/write	90	30~120Hz	DIGI1
1221	03/16	C04	Compressor model selection	read/write	0	0~99	DIGI1
1222	03/16	C05	Compressor minimum frequency of low ambient temp. (Cooling)	read/write	50	0~60Hz	DIGI1
1223	03/16	C06	Compressor frequency control mode	read/write	1	1-120	DIGI1

1224	03/16	C07	Frequency resonance point 1	read/write	0	0~120	DIGI1
1225	03/16	C08	Frequency resonance point 2	read/write	0	0~120	DIGI1
1226	03/16	C09	Frequency resonance point 3	read/write	0	0~120	DIGI1
1227	03/16		Reserved	read/write			
1228	03/16	R42	Max water heating temp.	read/write	55	20~60°C	TEMP1
1229	03/16	R43	Max water heating temp. (Under Low Temp.)	read/write	50	20~60°C	TEMP1
1230	03/16	R44	Max Water heating temp. (Under High Temp.)	read/write	40	20~60°C	TEMP1
1231	03/16	R45	Electric heater starts (No Delay) ambient temp)	read/write	-10	-50~20°C	TEMP1
1232	03/16	R46	the temp restart difference of the outlet water overheat protection	read/write	5	0~15	TEMP1
1233	03/16		Reserved	read/write			
1234	03/16		Weather compensation slope	read/write		0~3.5	DIGI5
1235	03/16		Weather compensation offset	read/write		0~85	TEMP1
1236	03/16		Weather compensation function enable during heating	read/write		0-no,1-yes	DIGI1
1237	03/16		Reserved	read/write			
1238	03/16		Reserved	read/write			
1239	03/16		Reserved	read/write			
1240	03/16		Reserved	read/write			
1241	03/16		Reserved	read/write			
1242	03/16		Reserved	read/write			
1243	03/16		Reserved	read/write			
1244	03/16		Timer mute function on enable	read/write		0-off/1-on	DIGI1
1245	03/16		Timer mute on hour	read/write		0-23h	DIGI1
1246	03/16		Timer mute on minute	read/write		0-59min	DIGI1
1247	03/16		Timer mute function off enable	read/write		0-off/1-on	DIGI1
1248	03/16		Timer mute off hour	read/write		0-23h	DIGI1
1249	03/16		Timer mute off minute	read/write		0-59min	DIGI1
1250	03/16		system time enable	read/write		system time enable	
1251	03/16		system current minute	read/write		system current minute	
1252	03/16		system current hour	read/write		system current hour	
1253	03/16		system current day	read/write		system current day	

1254	03/16		system current month	read/write		system current month	
1255	03/16		system current year	read/write		system current year	
1256	03/16		7*24 hours timer on/off Sunday	read/write		/	
1257	03/16		7*24 hours timer on/off Sunday	read/write		/	
1258	03/16		7*24 hours timer on/off Monday	read/write		/	
1259	03/16		7*24 hours timer on/off Monday	read/write		/	
1260	03/16		7*24 hours timer on/off Tuesday	read/write		/	
1261	03/16		7*24 hours timer on/off Tuesday	read/write		/	
1262	03/16		7*24 hours timer on/off Wednesday	read/write		/	
1263	03/16		7*24 hours timer on/off Wednesday	read/write		/	
1264	03/16		7*24 hours timer on/off Thursday	read/write		/	
1265	03/16		7*24 hours timer on/off Thursday	read/write		/	
1266	03/16		7*24 hours timer on/off Friday	read/write		/	
1267	03/16		7*24 hours timer on/off Friday	read/write		/	
1268	03/16		7*24 hours timer on/off Saturday	read/write		/	
1269	03/16		7*24 hours timer on/off Saturday	read/write		/	
1270	03/16		Reserved	read/write			
2011	16		Unit state	read		0-off/1-on	DIGI1
2012	16		Unit mode	read		0-cooling/1-heating/2-defrost/3-sterilize/4-hot water	DIGI1
2013	16		Temperature value after limiting	read			TEMP1
2014	16		Temperature value after weather compensation during heating	read			TEMP1
2015	16		Reserved	read			
2016	16		Reserved	read			
2017	16		Reserved	read			
2018	16	O124	DTU state	read		0-OFF/1-ON	DIGI1

2019	16	O01~014	Load output	read		bit0: O01 compressor output (0-OFF/1-ON) bit1: Reserved bit2: O03 fan high speed output (0-OFF/1-ON) bit3: O04 fan low speed output (0-OFF/1-ON) bit4: O05 water pump output (0-OFF/1-ON) bit5: O06 hot water pump output (0-OFF/1-ON) bit6: O07 4 way valve 1 (0-OFF/1-ON) bit7: O08 Electric heater stage 1 (0-OFF/1-ON) bit8: O09 Electric heater stage 2 (0-OFF/1-ON) bit9: O10 3 way valve (0-OFF/1-ON) bit10: O11 alarm output (0-OFF/1-ON) bit11: O12 Crankcase Heater (0-OFF/1-ON) bit12: O13 Pan heater (0-OFF/1-ON) bit13: O21 heating water pump (0-OFF/1-ON) bit14: O22 Hydraulic module water loop electric heater (0-OFF/1-ON) bit15: O23 Hydraulic module DHW tank electric heater (0-OFF/1-ON)	DIGI1
2020	16	O15	EEV Steps	read		0~500N	DIGI1
2021	16	O16	Reserved	read		0~500N	DIGI1
2022	16	O17	EVI EEV Steps	read		0~500N	DIGI1
2023	16	O18	Reserved	read		0~500N	DIGI1
2024	16		Reserved	read			
2025	16		Reserved	read			
2026	16		Reserved	read			
2027	16		Reserved	read			
2028	16		Reserved	read			
2029	16		Reserved	read			
2030	16		Reserved	read			
2031	16		Reserved	read			

2032	16		Compressor accumulative running time	read			DIGI1
2033	16		Reserved	read			
2034	16	S01~S10	Switch state	read		bit0: S01 high pressure switch (0-on/1-off) bit1: S02 Low pressure switch (0-on/1-off) bit2: S03 water flow switch (0-on/1-off) bit3: S04 Electric heater overheat switch (0-on/1-off) bit4: S05 Remote ON/OFF (0-on/1-off) bit5: S06 Remote heating/cooling (0-on/1-off) bit6: S07 hot Water flow switch (0-on/1-off) bit7: Reserved bit8: Reserved bit9: Heating/cooling ON/OFF (0-on/1-off) bit10: Reserved bit11: Reserved bit12: Reserved bit13: Reserved bit14: Reserved bit15: Reserved	DIGI1
2035	16	T40	Heating return water temp	read			
2036	16	T41	Heating outlet water temp	read			
2037	16	T42	Mixing outlet water temp	read			
2038	16	T43	DHW return water temp	read			
2039	16	T44	DHW outlet water temp	read			
2040	16		Reserved	read			
2041	16		Reserved	read			
2042	16	T36	Compressor currents	read		real test value	DIGI5
2043	16	T37	DC line voltage	read		real test value	DIGI1
2044	16	T38	IPM temp	read		real test value	TEMP1
2045	16	T01	Inlet water temp	read		real test value	TEMP1
2046	16	T02	Outlet water temp	read		real test value	TEMP1
2047	16	T08	DHW tank water temp	read		real test value	TEMP1

2048	16	T04	Ambient temp	read		real test value	TEMP1
2049	16	T03	Coil temp	read		real test value	TEMP1
2050	16		Reserved	read			TEMP1
2051	16	T05	Suction temp	read		real test value	TEMP1
2052	16		Reserved	read			TEMP1
2053	16	T12	Discharge temp	read		real test value	TEMP1
2054	16		Reserved	read			TEMP1
2055	16	T06	Anti-freeze temp	read		real test value	TEMP1
2056	16		Reserved	read			TEMP1
2057	16	T35	AC input currents	read		real test value	DIGI5
2058	16	T09	Room temp	read		real test value	TEMP1
2059	16		Reserved	read			TEMP1
2060	16		Reserved	read			TEMP1
2061	16	T33	IPM overheat stop running	read		real test value	TEMP1
2062	16	T34	Ac input voltage	read		real test value	DIGI1
2063	16	T10	EVI inlet temp	read		real test value	TEMP1
2064	16	T11	EVI outlet temp	read		real test value	TEMP1
2065	16		Reserved	read			TEMP1
2066	16		Reserved	read			TEMP1
2067	16		Reserved	read			DIGI5
2068	16		Reserved	read			DIGI5
2069	16	T15	low pressure value	read			DIGI5
2070	16		Reserved	read			DIGI5
2071	16	T30	Compressor frequency setting	read		real test value	DIGI1
2072	16	T31	Compressor running frequency setting	read		real test value	DIGI1
2073	16	T32	inverter board max frequency	read		real test value	DIGI1
2074	16	T27	DC fan 1 speed	read		real test value	DIGI1
2075	16	T28	DC fan 2 speed	read		real test value	DIGI1
2076	16	T29	DC fan target speed	read		real test value	DIGI1
2077	16	T39	Water flow	read			DIGI9
2078	16		Reserved	read			
2079	16		Reserved	read			
2080	16		Reserved	read			

2081	16		Failure 7	read		bit0: IPM overheat bit1: compressor start failure bit2: compressor over currents bit3: Input voltage phase loss bit4: IPM current sampling fault bit5: Overheat protection of drive board devices bit6: PFC failure bit7: DC busbar overvoltage bit8: DC bus undervoltage bit9: AC input voltage undervoltage bit10: AC input overcurrent shutdown bit11: Input voltage sampling fault bit12: DSP and PFC communication failure bit13: Drive plate temperature fault bit14: DSP and communication board communication failure bit15: mainboard communication failure	DIGI1
2082	16		Failure 8	read		bit0: IPM overheat stop bit1: Reserved bit2: Reserved Bit3: 15VDV under voltage bit4: Reserved bit5: Reserved bit6: Reserved bit7: Reserved bit8: Reserved bit9: Reserved bit10: Reserved bit11: Reserved bit12: Reserved bit13: Reserved bit14: Reserved bit15: Reserved	DIGI1

2083	16		Failure 9	read		bit0: Voltage electro-mechanical current down frequency alarm bit1: Compressor weak magnetic protection alarm bit2: Power unit overheating alarm bit3: Reserved bit4: AC input current down alarm bit5: EEPROM failure warning bit6: Reserved bit7: / bit8: Reserved bit9: Reserved bit10:Reserved bit11:Reserved bit12:Reserved bit13:Reserved bit14:Reserved bit15:Reserved	DIGI1
2084	16			read			DIGI1

2085	16		Failure 1	read		bit0: Reserved bit1: Reserved bit2: Heating return water temp sensor failure(0-no/1-yes) bit3: Heating outlet water temp sensor failure(0-no/1-yes) bit4: High pressure protection (0-no/1-yes) bit5: Reserved bit6: Low pressure protection (0-no/1-yes) bit7: Reserved bit8: water flow protection (0-no/1-yes) bit9: Electric heating overload protection (0-no/1-yes) bit10: Winter first class anti-freeze protection(0-no/1-yes) bit11: Winter secondary class anti-freeze protection (0-no/1-yes) bit12: anti-freeze protection (0-no/1-yes) bit13: Reserved bit14: Room temp (0-no/1-yes) bit15: Reserved	DIGI1
------	----	--	-----------	------	--	--	-------

2086	16		Failure 2	read		bit0: Exhaust temperature overprotection (0-no/1-yes) bit1: Reserved bit2: Reserved bit3: Fan 1 overload speed limit (0-no/1-yes) bit4: Fan 2 overload speed limit (0-no/1-yes) bit5: Reserved bit6: Outlet water over heat (0-no/1-yes) bit7: Mixing outlet water temp sensor failure(0-no/1-yes) bit8: Hot water return temp sensor failure (0-no/1-yes) bit9: Hot water outlet water temp sensor failure(0-no/1-yes) bit10: Reserved bit11: Reserved bit12: Reserved bit13: Reserved bit14: Reserved bit15: Reserved	DIGI1
------	----	--	-----------	------	--	--	-------

2087	16		Failure 3	read		bit0: Reserved bit1: Reserved bit2: Reserved bit3: Reserved bit4: high pressure protection 3 times (0-no/1-yes) bit5: Reserved bit6: low pressure protection 3 times (0-no/1-yes) bit7: Reserved bit8: water flow protection 3 times (0-no/1-yes) bit9: Electric heating protection 3 times (0-no/1-yes) bit10: Reserved bit11: Reserved bit12: Anti-freeze protection 3 times (0-no/1-yes) bit13: Reserved bit14: Reserved bit15: Reserved	DIGI1
------	----	--	-----------	------	--	--	-------

2088	16		Failure 4	read		bit0: Discharge over heat protection 3 times (0-no/1-yes) bit1: Reserved bit2: Reserved bit3: Reserved bit4: Outlet water overtemp protection 3 times (0-no/1-yes) bit5: Reserved bit6: Reserved bit7: Reserved bit8: Reserved bit9: Reserved bit10: Reserved bit11: Reserved bit12: Reserved bit13: Reserved bit14: Reserved bit15: Reserved	DIG11
------	----	--	-----------	------	--	--	-------

2089	16		Failure 5	read		bit0: Inlet water temp failure (0-no/1-yes) bit1: Outlet water temp failure (0-no/1-yes) bit2: Coil temp failure (0-no/1-yes) bit3: Ambient temp failure (0-no/1-yes) bit4: Suction temp failure (0-no/1-yes) bit5: Anti-freeze temp sensor failure (0-no/1-yes) bit6: Reserved bit7: Reserved bit8: Reserved bit9: EVI inlet temp failure (0-no/1-yes) bit10: EVI outlet temp failure (0-no/1-yes) bit11: discharge temp failure (0-no/1-yes) bit12: Reserved bit13: System 1 pressure sensor failure (0-no/1-yes) bit14: low ambient temp failure (0-no/1-yes) bit15: Reserved	DIGI1
------	----	--	-----------	------	--	---	-------

2090	16		Failure 6	read		bit0: Reserved bit1: Reserved bit2: Reserved bit3: Reserved bit4: Reserved bit5: Reserved bit6: Reserved bit7: Reserved bit8: Hot water temp failure (0-no/1-yes) bit9: Reserved bit10: Reserved bit11: Fan 1 failure (0-no/1-yes) bit12: Fan 2 failure (0-no/1-yes) bit13: Communication failure(main board with fan motor module board) (0-no/1-yes) bit14: Reserved bit15: Communication failure(main board with fan motor 2 module board) (0-no/1-yes)	DIGI1
2101	16		Reserved	read			
2109	16		Reserved	read			
2110	16		Reserved	read			
2111	16		Reserved	read			
2112	16		Reserved	read			
2113	16		Reserved	read			
2114	16		Reserved	read			
2115-2180	16		Reserved	read			