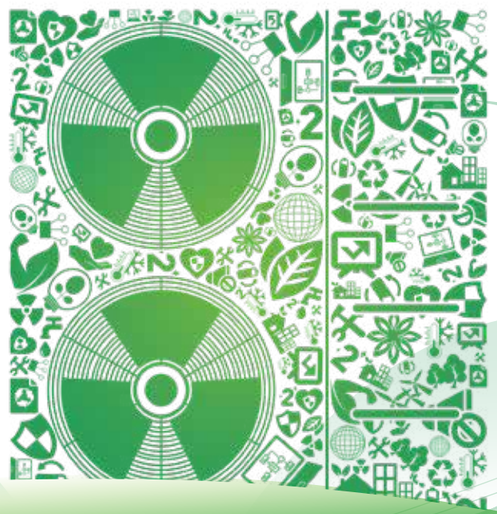
CAL PRO

A HEAT PUMP MANUFACTURER - ALL FOCUS ON OEM AND ODM

DC INVERTER
Air to Water Heat Pump
Heating & Cooling



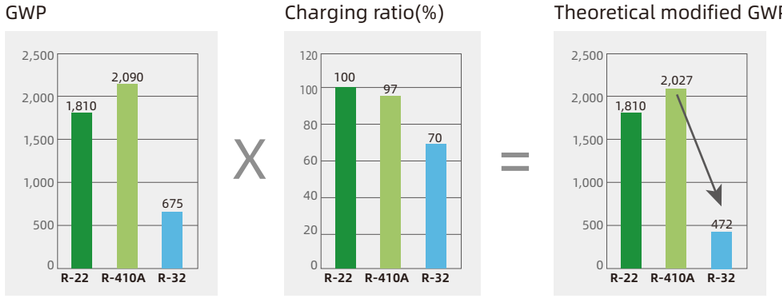
Commercial DC Inverter Air To Water Heat Pump
Heating And Cooling
R32

R-32 is the most balanced refrigerant in terms of Environmental Impact/Energy Efficiency/Safety/Cost-Effectiveness for Stationary Air Conditioners and Heat Pumps.

Smaller Impact on Environment

R-32 has zero ODP (Ozone Depletion Potential) and its GWP (Global Warming Potential) is 675, which is lower than the GWP of currently used R-410A or R-22. It could reduce the charging volume by 30% compared to R-410A. R-32 related CO2 emissions decrease by 76% thanks to the lower GWP and the charging volume reduction.

Theoretical Modified GWP



Energy Efficiency: High Energy Efficiency

The potential refrigerating effect of R-32 is 1.5 times that of R-22 or R-410A. The cooling seasonal performance factor (CSPF) of R-32 is higher than conventional refrigerants. Its peak power consumption is also lower, helping to alleviate power shortages in large cities during periods of high demand.

Safety: Flammability

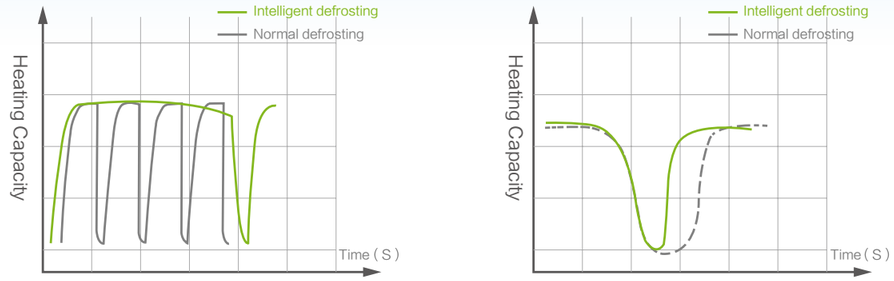
ISO 817:2014 Safety Group Classification

	Flammability		LOw Toxicity A		High Toxicity B
Class 3	Higher flammability	A3	Propane,lsobutane.Others	B3	n/a
Class 2	Flammable	A2	R-152a	B2	R-40,R-611
Class 2L	Lowerflammability	A2L	R-32(675),R-1234y(4), R-1234ze(E1(6), 0thers	B2L	Am monia
Class 1	No flame propagation	A1	R-410A(2090). R-134a(1430)R-407C(1770), Others	B1	R-123,R-245fa

A2L and B2L are lower flammability refrigerants with a maximum burning velocity ≤ 10 cm/s (3.9 in./s)

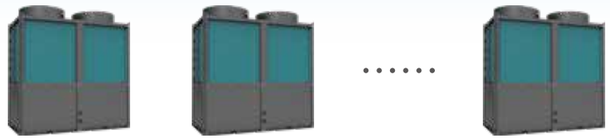
Intelligent Defrosting Technology

Accurately judge the defrosting timing according to the main parameters of the heating operation and the load change, so as to achieve defrosting with frost and normal heating without frost, and can perform forced manual defrosting according to the actual situation.



Modular design, more flexible installation

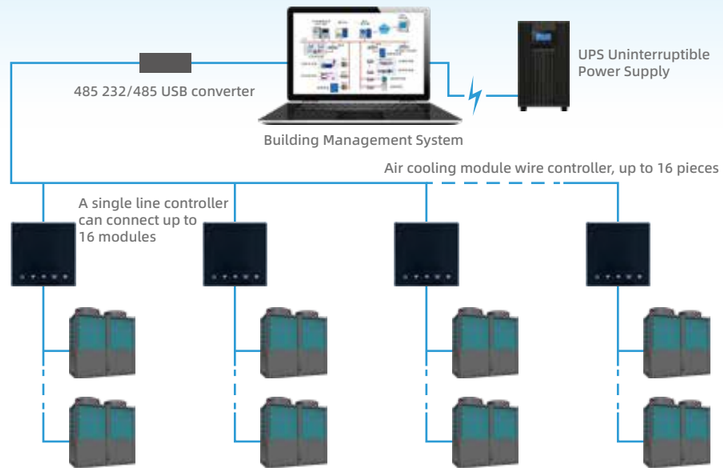
Unit modules of different capacity specifications can be freely combined, and a maximum of 8 units can be connected in parallel, with strong compatibility and scalability.



According to the site characteristics of the installation site, the user can choose a variety of combination connection methods to realize the parallel use of 1-8 modules

Building intelligent control to improve management reliability

Modbus is an open protocol that is widely used, especially in BMS building control systems. The unit can be connected to the BMS system through the Modbus protocol to realize remote control of multiple air cooling and heat pump modules.



DC Inverter Compressor From Mitsubishi & Hitachi

High Efficiency Gas Injection DC Inverter Scroll Compressor. Direct Suction Reduces superheat, improved volumetric efficiency. Improved Asymmetric Wrap Additional displacement and superheat reduction for greater compressor efficiency.

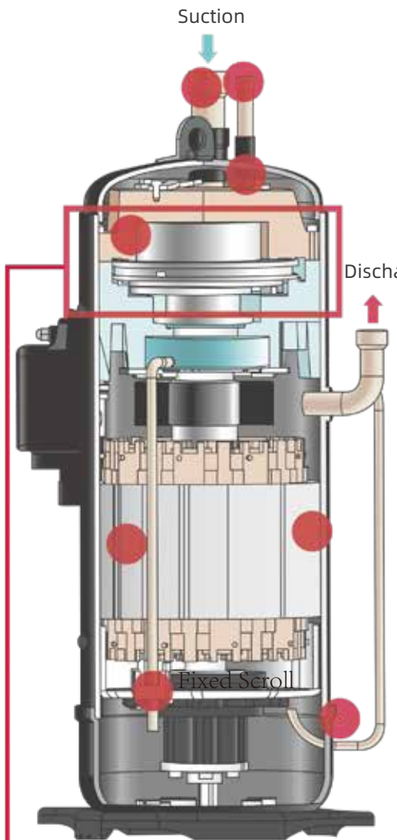
Hitachi High Eficiency Gas injection
DC inverter Scroll Compressor

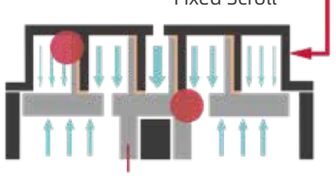
1.Direct Suction
Reduces superheat, improved volumetric efficiency.

2.Improved Asymmetric Wrap
Additional displacement and superheat reduction for greater compressor efficiency.

3.High Efficiency Motor
Maintains high efficiency levels across wide speed range of 10-140 rps.

4.Internal Oil Circulation Structure
Low oil circulation rates (<2%) keeping oil in the compressor for superior reliability.





5.Gas Injection Technology
Lower discharge temperatures. increasing capacity and expanded operating envelop for enhanced performance.

6.Bypass Valves
Improved partial load efficiency with self-adapting variable pressure ratios for upgraded performance -low ambient heating and high ambient cooling.

7. High-side Pressure Design
Higher volumetric efficiency and improved oil management.

8. Dynamic Oil Balance Structure
Patented technology for unsurpassed oil balance in parallel piped system operation.

9.Non-contact Oil Membrane
Oil film seals involute section of scroll set, reducing compression leakage for improved performance and lower sound.

10.Intermediate Gas Pressure
Axial force is continually adapting. blending discharge pressure and compressed suction pressure for optimized performance throughout the operating envelop.

MITSUBISHI HITACHI

CAL PRO

Wide Application Range

Working ambient temperature can be from -25~48℃;
Highest Water output temperature can be maximum 60℃.

High quality Plate type heat exchanger and Shell & tube heat exchanger

Stepless Adjustable Fan Motor

With special driving board for fan motor, the fan motor work as stepless adjustment, Synchronous operation with DC Inverter compressor, saving more energy and working more quitely.

High quality Sanhua brand pressure sensor

Excellent precision, excellent mechanical resistance and EMC protection characteristics, meeting the most stringent application requirements under various pressure conditions.

Good desinged touch screen control panel

More Advantages

Wifi

Wifi function for option.
Control the heat pump on your smartphone anywhere anytime.

Gas-liquid separator

A large gas-liquid separator is used to prevent liquid from entering the compressor under low temperature conditions, ensuring more reliable system operation.

ELECTRONIC EXPANSION VALVE

High precision electronic expansion valve: use electronic expansion valve for controlling, reach 500 steps adjustment, adjust super heat degrees accurately, achieve high efficiency operation system.

MULTIPLE PROTECTION

Equipped with high and low pressure switches, antifreeze protection devices, overload protection devices, power supply phase sequence protection devices, etc.
When a fault occurs, the controller will automatically alarm in real time.

CAL PRO

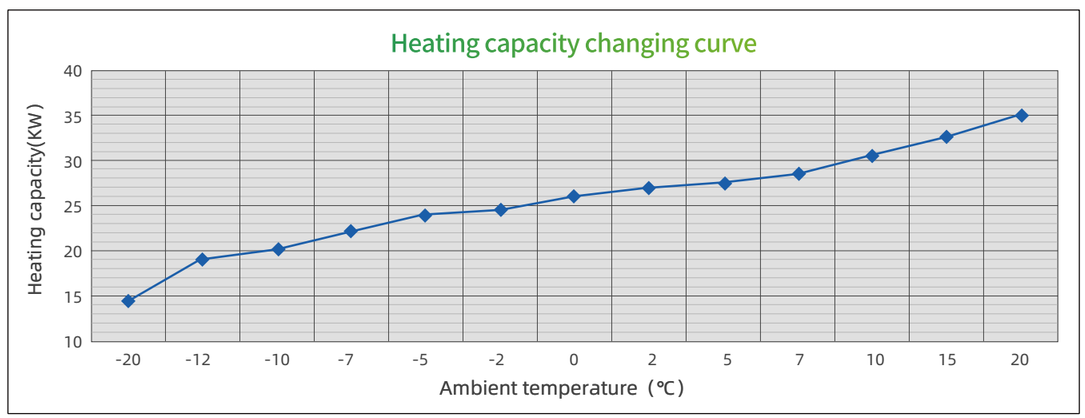
TITAN series DC Inverter air to water heat pump for Heating & Cooling Commercial type(R32)

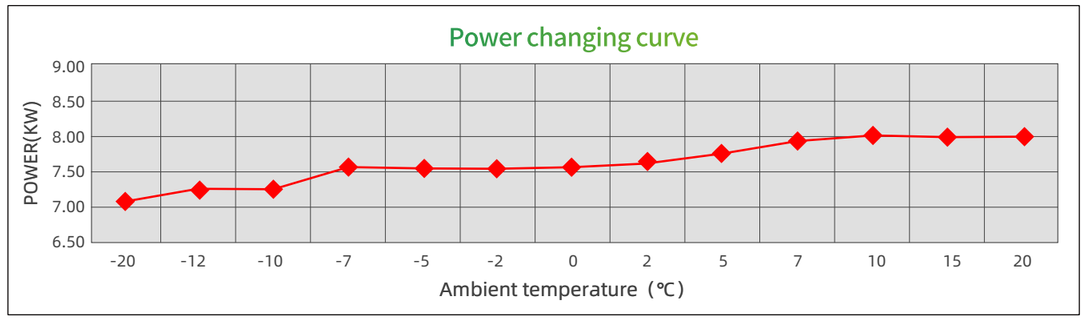
Model			TT30II/BPN	TT45II/BPN	TT73II/BPN	TT146II/BPN
Compressor brand			MITSUBISHI	HITACHI	HITACHI	HITACHI
HorsePower			10HP	15HP	25HP	50HP
Rated heating 1	Rated heating capacity (A7 W35)	kW	29.50	45.00	73.00	146.00
	Rated power consumption	kW	7.12	10.72	20.10	40.22
	COP	W/W	4.14	4.20	3.63	3.63
Rated heating 2	Rated heating capacity (A7 W45)	kW	27.50	42.00	68.00	136.00
	Rated power consumption	kW	7.68	11.87	22.40	44.80
	COP	W/W	3.58	3.54	3.04	3.04
Floor heating	Nominal heating capacity (A-12 W35)	kW	19.00	30.00	48.00	96.00
	Nominal power consumption	kW	6.60	10.24	16.50	33.07
	COP	W/W	2.88	2.93	2.91	2.90
	Low temp. heating capacity (A-20 W35)	kW	14.50	22.00	36.00	72.00
	Low temp. power consumption	kW	6.40	9.64	17.82	35.82
	COP	W/W	2.27	2.28	2.02	2.01
Fan coil heating	Nominal heating capacity (A-12 W41)	kW	19.00	29.00	47.00	94.00
	Nominal power consumption	kW	7.28	10.96	21.36	42.34
	COP	W/W	2.61	2.65	2.20	2.22
	Low temp. heating capacity (A-20 W41)	kW	14.50	22.00	36.00	72.00
	Low temp. power consumption	kW	7.08	10.66	19.78	39.78
	COP	W/W	2.05	2.06	1.82	1.81
Radiator heating	Nominal heating capacity (A-12 W50)	kW	18.50	28.50	46.00	92.00
	Nominal power consumption	kW	8.40	12.65	23.11	46.46
	COP	W/W	2.20	2.25	1.99	1.98
	Low temp. capacity (A-20 W50)	kW	13.50	20.00	33.00	66.00
	Low temp. power consumption	kW	7.68	11.57	20.37	40.74
	COP	W/W	1.76	1.73	1.62	1.62
Nominal cooling	Nominal cooling capacity (A35 W7)	kW	26.00	40.00	63.00	126.00
	Nominal power consumption	kW	8.81	13.65	22.10	44.20
	EER	W/W	2.95	2.93	2.85	2.85
Refrigerant		Type	R32			
		Qty.	5.5kg	7.5kg	14.5kg	15kgx 2
Compressor		Type	DC Inverter compressor			
		Qty.	1	1	1	2
Fan motor		Type	Stepless Speed Adjustment			
Driver cooling		Type	Air-cooled	Refrigerant-cooled		
Air side heat exchanger		Type	High Efficiency Hydrophobic Aluminum Foil Fin Heat Exchanger			
Water side heat exchanger		Type	Plate type			Shell & tube
Power supply		/	380V 3N ~ 50Hz			
Heating operating ambient temperature range		℃	-25 ~ 48℃			
Cooling operating ambient temperature range		℃	10 ~ 48℃			
Maximum input power		kW	10.5	16.4	26.6	53.8
Maximum input current		A	20.5	31.9	51.9	104.9
Waterproof level		/	IPX4			
Anti-electric shock type		/	Type I			
Water inlet/outlet pipe		DN	DN32	DN40	DN50	DN80
Water flow required		m^3/h	4.47	6.88	11.18	22.36
Water pressure drop		kPa	37	43	45	60
Unit dimensions		mm	1600*820*1600	1600*820*1600	2000*1000*1950	2300*1250*2360
Net weight		kg	245	300	650	1250
Noise level		dB(A)	≤62	≤65	≤70	≤78

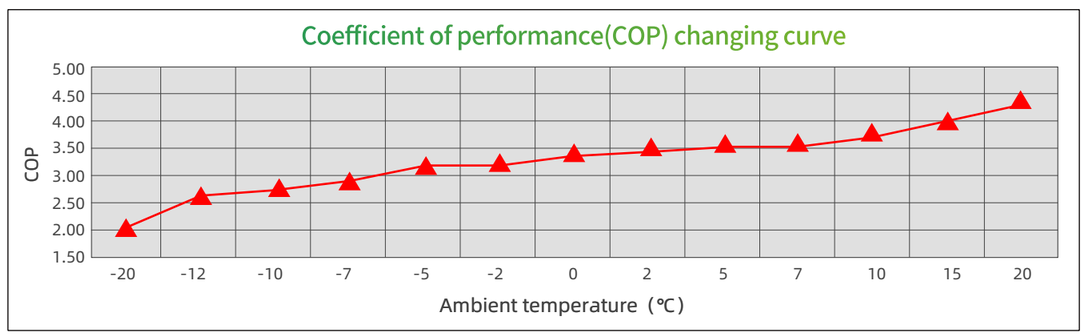
Test conditions:
- Rated heating 1: Inlet/outlet temperature 30℃/35℃. Dry bulb/wet bulb Temperature 7℃/6℃;
- Rated heating 2: Inlet/outlet temperature 40℃/45℃. Dry bulb/wet bulb Temperature 7℃/6℃;
- Floor nominal heating: Outlet Water Temperature 35℃. Dry Bulb/Wet Bulb Temperature -12℃/-13.5℃;
- Floor low temp. heating: Outlet Water Temperature 35℃. Dry Bulb/Wet Bulb Temperature -20℃/--;
- Fan coil nominal heating: outlet water temperature 41℃. Dry bulb/wet bulb temperature -12℃/-13.5℃;
- Fan coil low temp. heating: outlet water temperature 41℃. Dry bulb /Wet bulb temperature -20℃/--;
- Radiator nominal heating: outlet water temperature 50℃. Dry bulb/wet bulb temperature -12℃/-13.5℃;
- Radiator low temp. heating capacity: outlet water temperature 50℃. Dry Bulb/wet bulb temperature -20℃/--;
- Nominal cooling: Inlet/outlet temperature 12℃/7℃. Dry bulb/wet bulb temperature 35℃/24℃.

TT30II/BPN Heating performance correction coefficient(Water outlet temperature 41℃)

Ambient temperature(℃)	-20	-12	-10	-7	-5	-2	0	2	5	7	10	15	20
Heating capacity (KW)	14.5	19	20.1	22	24	24.5	26	27	27.5	28.5	30.5	32.5	35
Power (KW)	7.08	7.28	7.29	7.60	7.60	7.62	7.62	7.68	7.74	7.92	7.98	7.98	7.99
Energy efficiency ratio(COP)	2.05	2.61	2.76	2.89	3.16	3.22	3.41	3.52	3.55	3.60	3.82	4.07	4.38

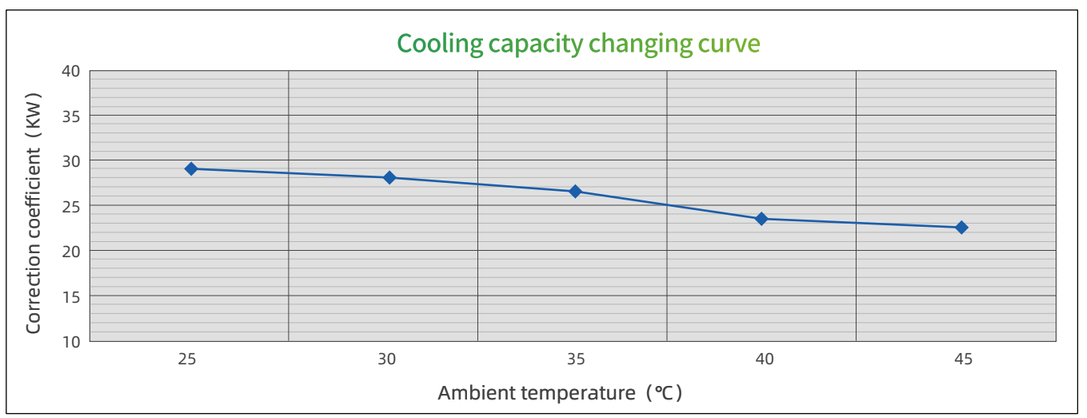


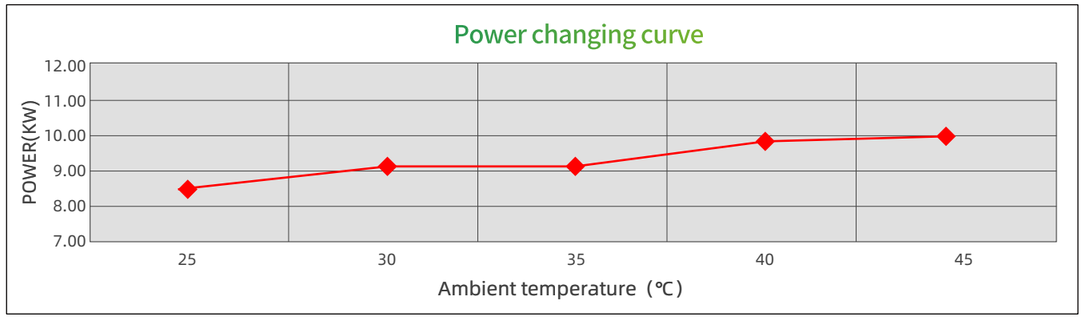


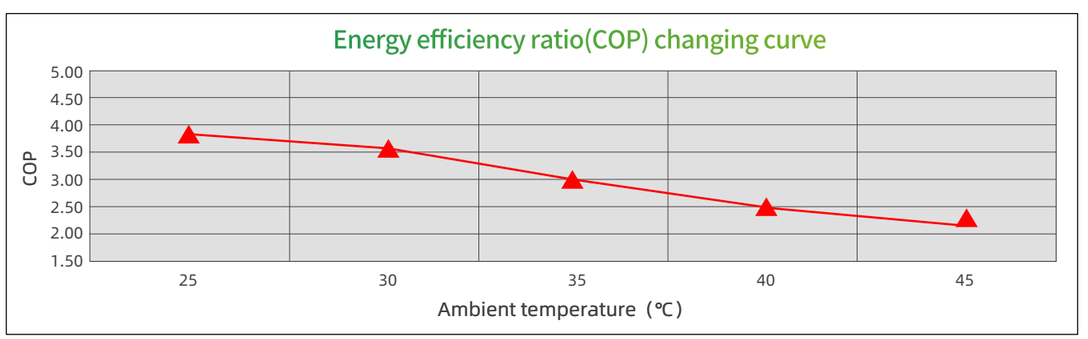


TT30II/BPN Cooling performance correction coefficient(Water outlet temperature 7℃)

Ambient temperature（℃）	25	30	35	40	45
Cooling capacity(KW)	29.5	27.8	26	23.6	23.1
Power（KW）	7.74	8.00	8.81	9.40	9.99
Energy efficiency ratio(COP)	3.81	3.48	2.95	2.51	2.31

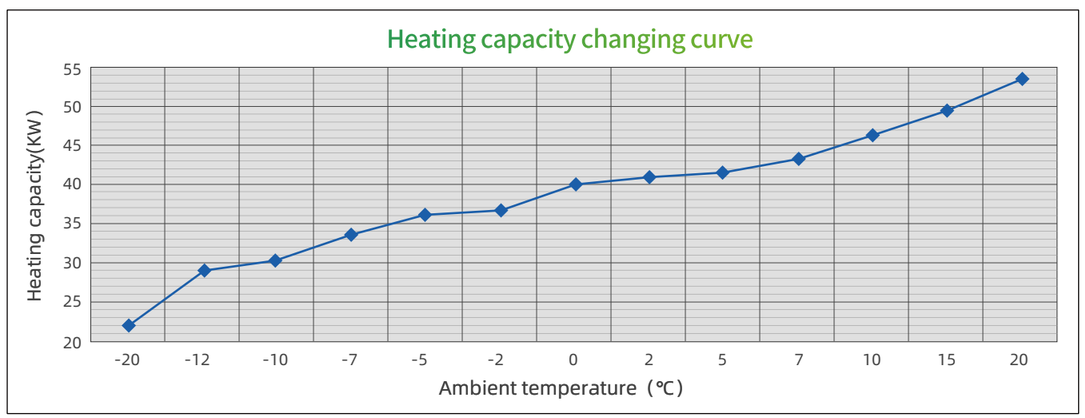


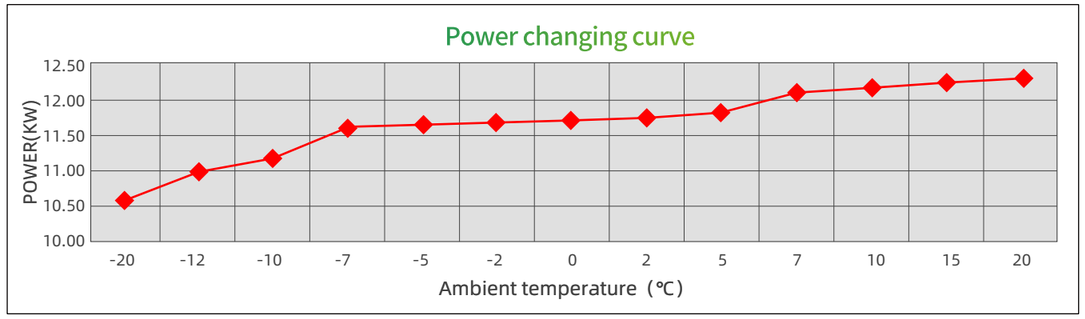


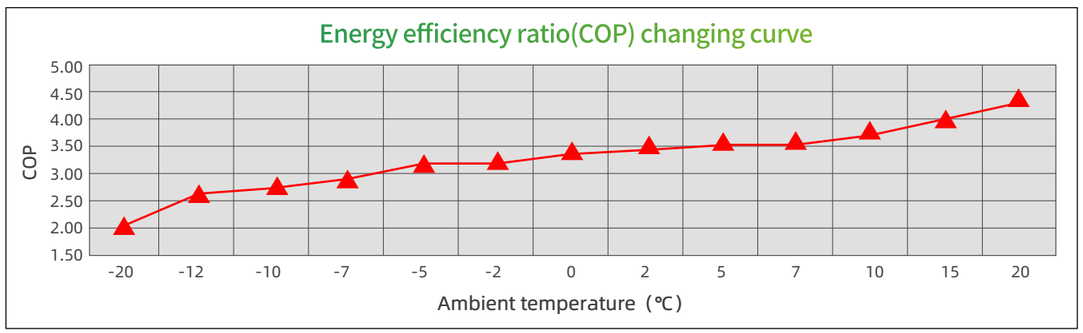


TT45II/BPN Heating performance correction coefficient(Water outlet temperature 41℃)

Ambient temperature(℃)	-20	-12	-10	-7	-5	-2	0	2	5	7	10	15	20
Heating capacity (KW)	22	29	30.55	33.44	36.48	37.24	39.52	41	41.8	43.3	46.36	49.4	53.2
Power (KW)	10.66	10.96	11.15	11.63	11.63	11.66	11.66	11.75	11.84	12.12	12.21	12.22	12.23
Energy efficiency ratio(COP)	2.05	2.65	2.74	2.88	3.14	3.19	3.39	3.49	3.53	3.57	3.80	4.04	4.35

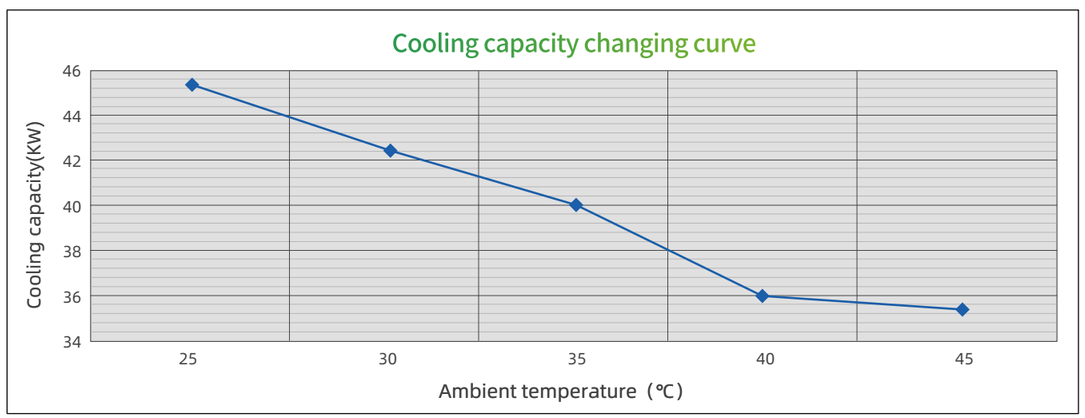


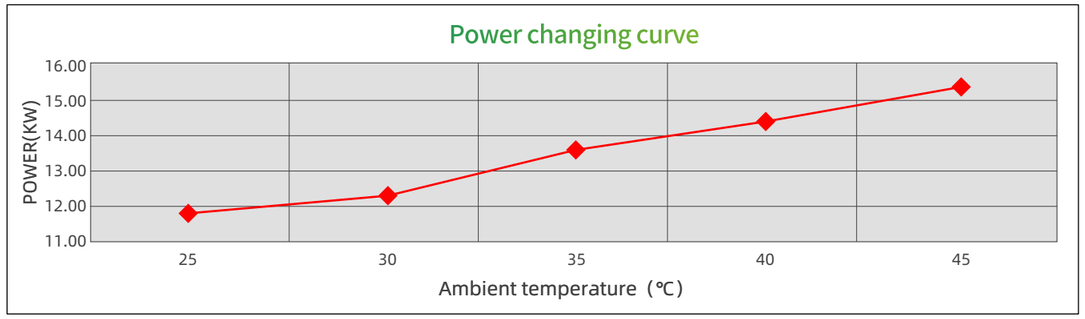


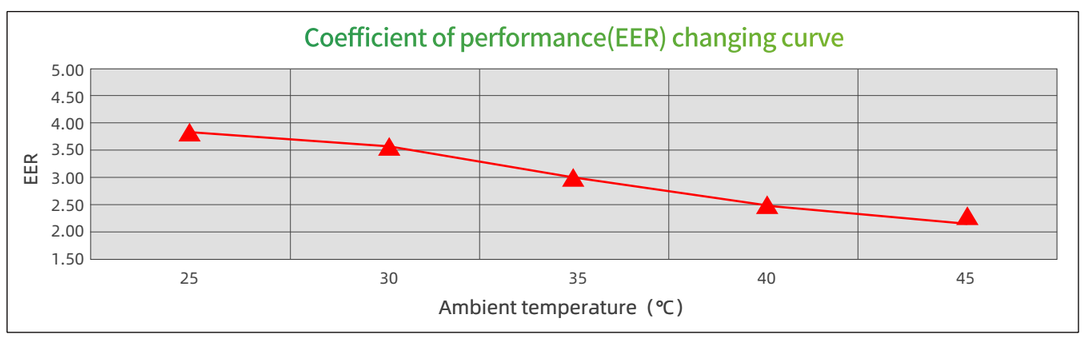


TT45II/BPN Cooling performance correction coefficient(Water outlet temperature 7℃)

Ambient temperature（℃）	25	30	35	40	45
Cooling capacity(KW)	45.14	42.5	40	36.1	35.2
Power（KW）	11.86	12.25	13.65	14.40	15.30
Energy efficiency ratio(COP)	3.81	3.47	2.93	2.51	2.30

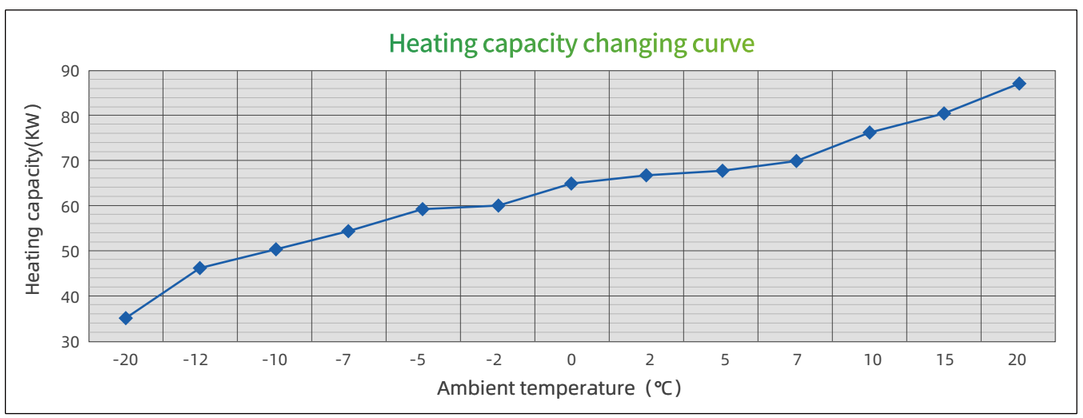


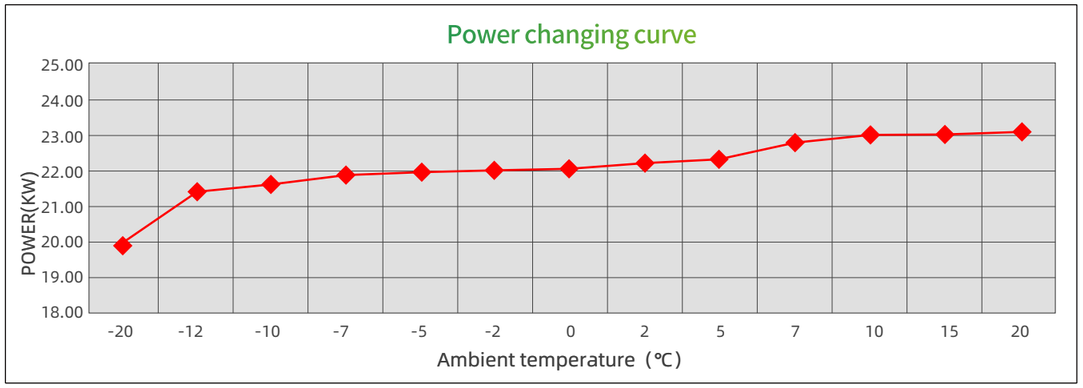


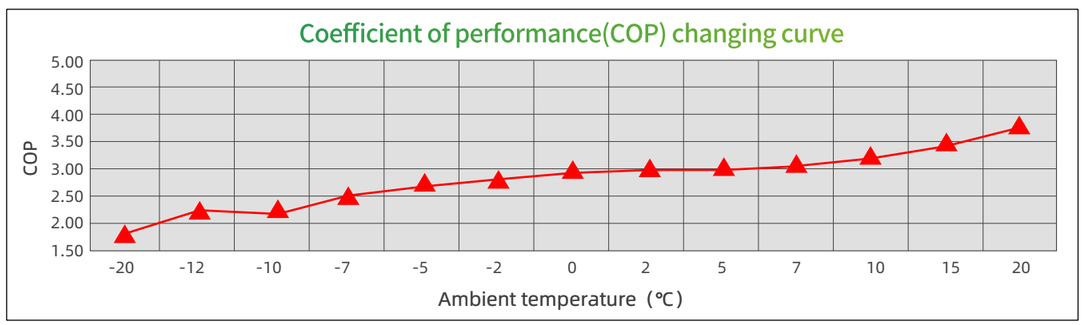


TT73II/BPN Heating performance correction coefficient(Water outlet temperature 41℃)

Ambient temperature(℃)	-20	-12	-10	-7	-5	-2	0	2	5	7	10	15	20
Heating capacity (KW)	36	47	49.49	54.17	59.1	60.33	64.02	66.5	67.72	70.2	75.1	80.03	86.18
Power (KW)	19.78	21.36	21.50	21.86	21.86	21.92	21.92	22.09	22.26	22.78	22.95	22.97	22.99
Energy efficiency ratio(COP)	1.82	2.20	2.30	2.48	2.70	2.75	2.92	3.01	3.04	3.08	3.27	3.48	3.75

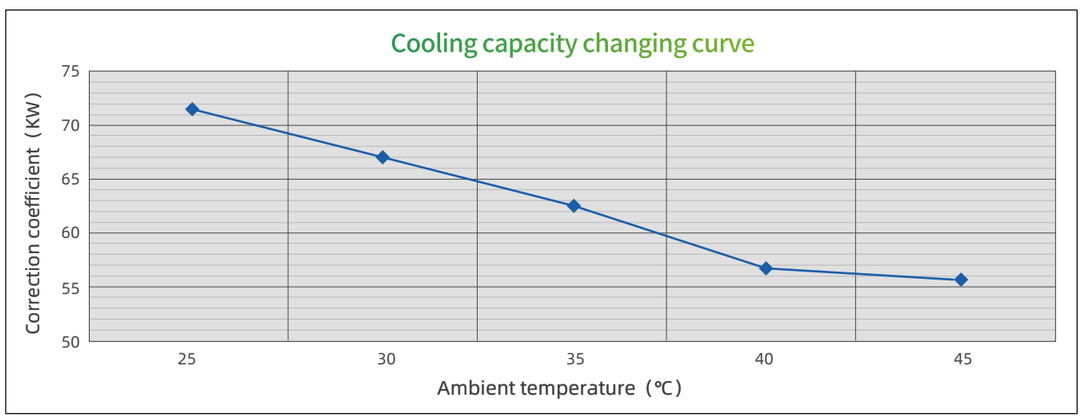


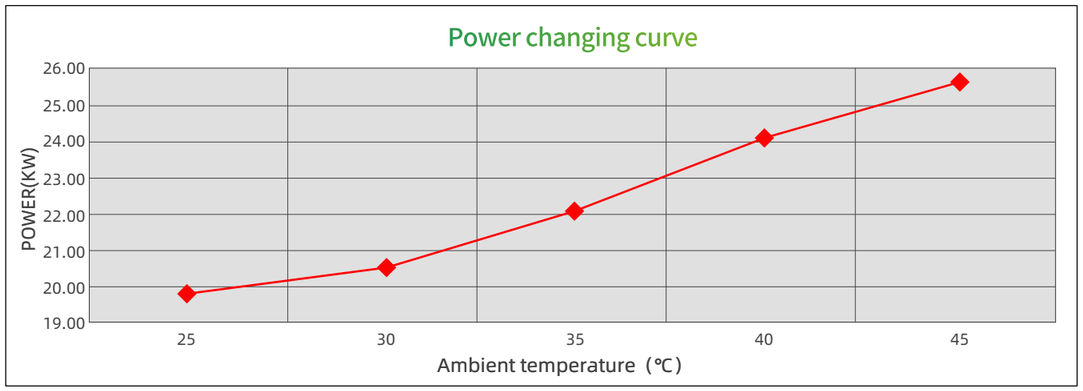


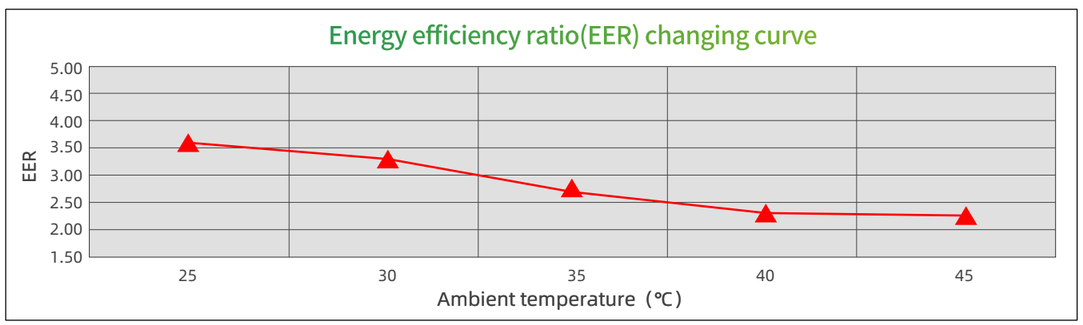


TT73II/BPN Cooling performance correction coefficient(Water outlet temperature 7℃)

Ambient temperature（℃）	25	30	35	40	45
Cooling capacity(KW)	71.1	66.94	63	56.86	55.44
Power（KW）	19.87	20.52	22.10	24.12	25.63
Energy efficiency ratio(COP)	3.58	3.26	2.85	2.36	2.16

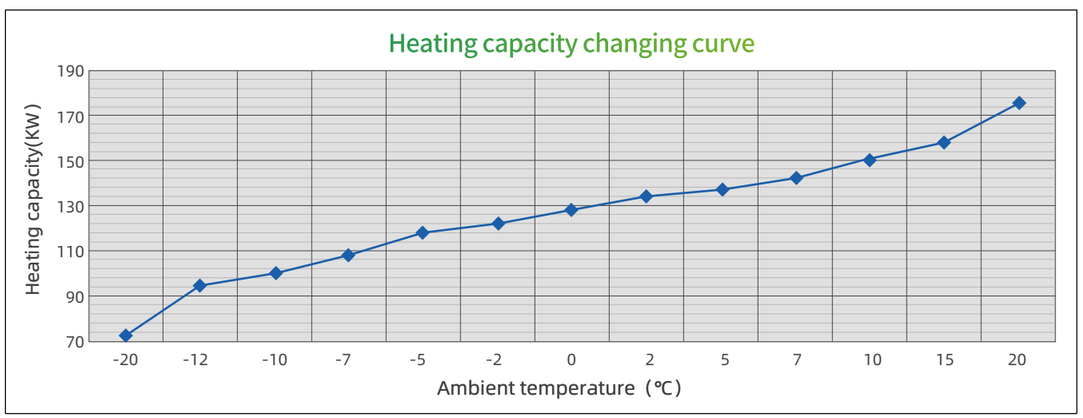


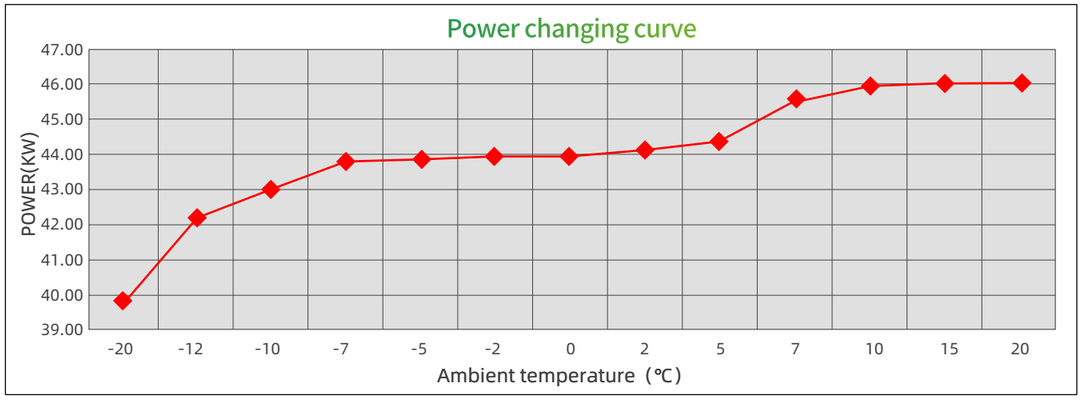


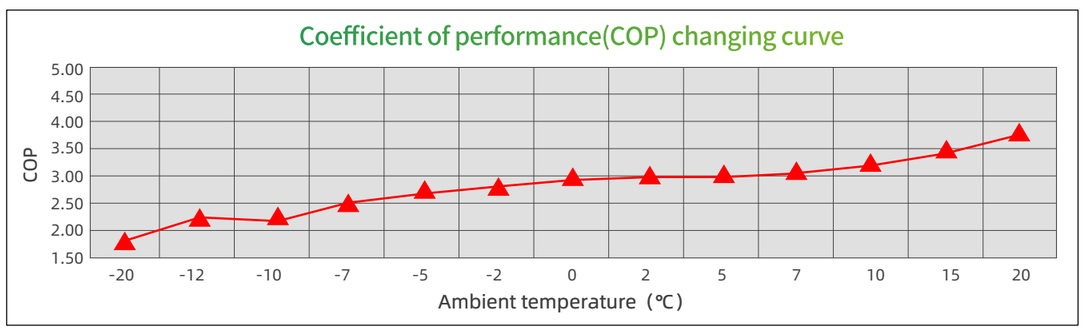


TT146II/BPN Heating performance correction coefficient(Water outlet temperature 41℃)

Ambient temperature(℃)	-20	-12	-10	-7	-5	-2	0	2	5	7	10	15	20
Heating capacity (KW)	72	94	98.99	108.3	118.2	120.7	128	133	135.4	140	150.2	160.1	172.4
Power (KW)	39.78	42.34	43.00	43.72	43.72	43.84	43.84	44.18	44.53	45.56	45.91	45.95	45.98
Energy efficiency ratio(COP)	1.82	2.22	2.30	2.48	2.70	2.75	2.92	3.01	3.04	3.08	3.27	3.48	3.75

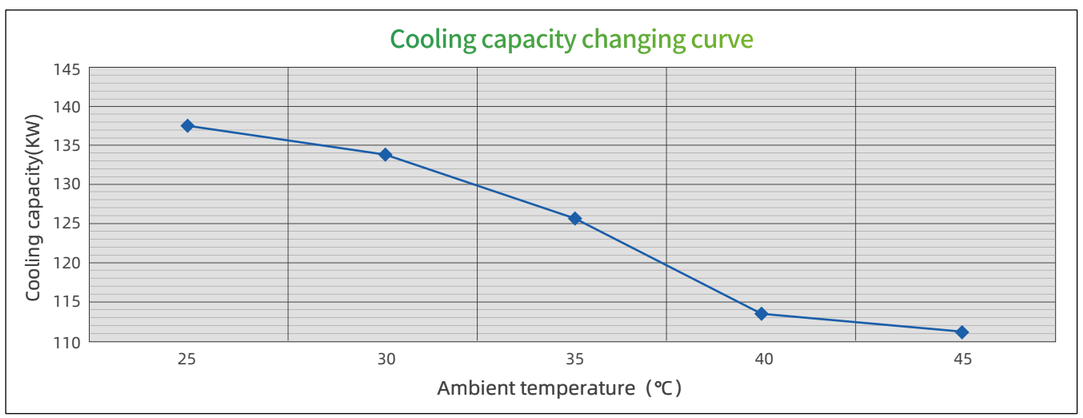


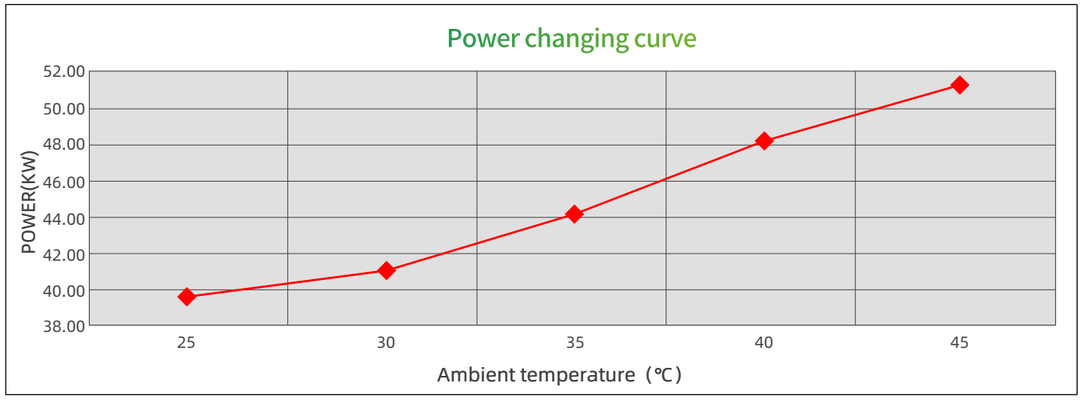


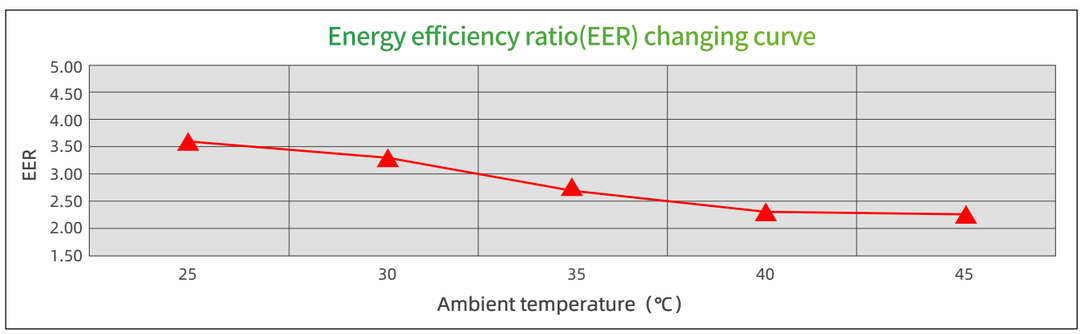


TT146II/BPN Cooling performance correction coefficient(Water outlet temperature 7℃)

Ambient temperature（℃）	25	30	35	40	45
Cooling capacity(KW)	142.2	133.88	126	113.72	110.88
Power（KW）	39.73	41.04	44.20	48.24	51.26
Energy efficiency ratio(COP)	3.58	3.26	2.85	2.36	2.16







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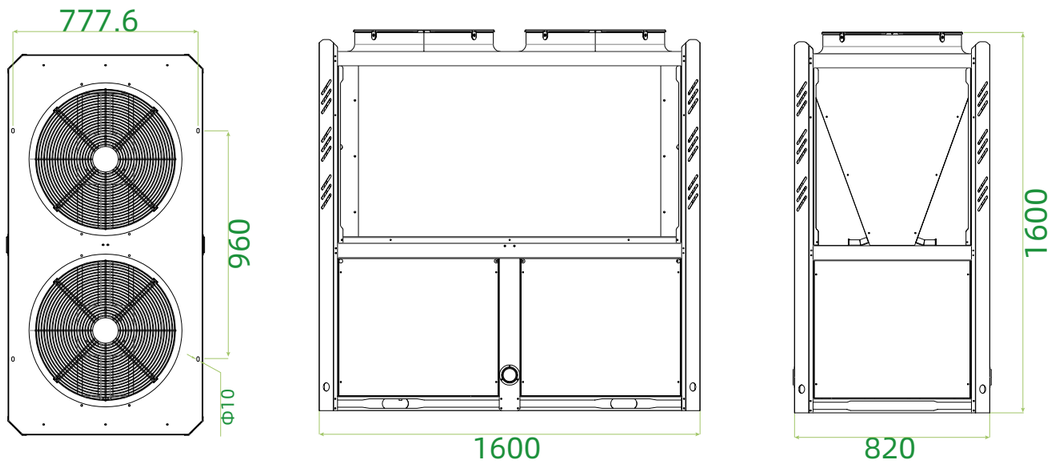

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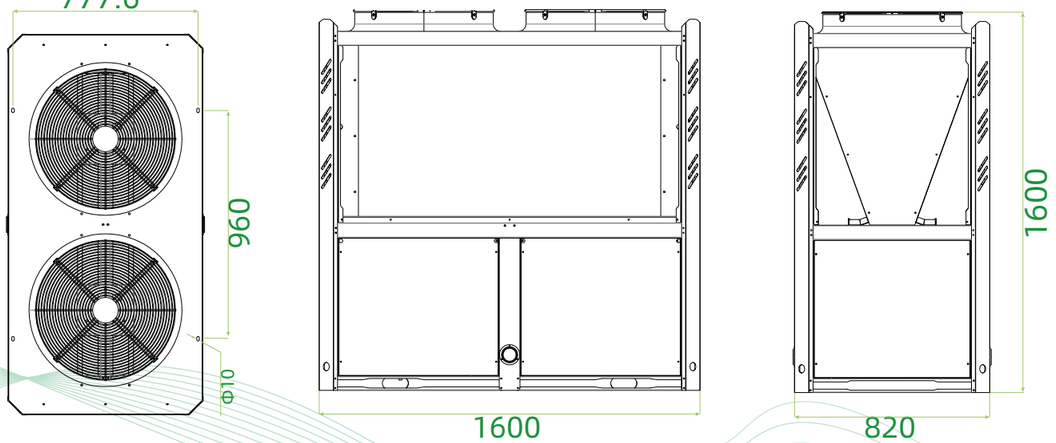

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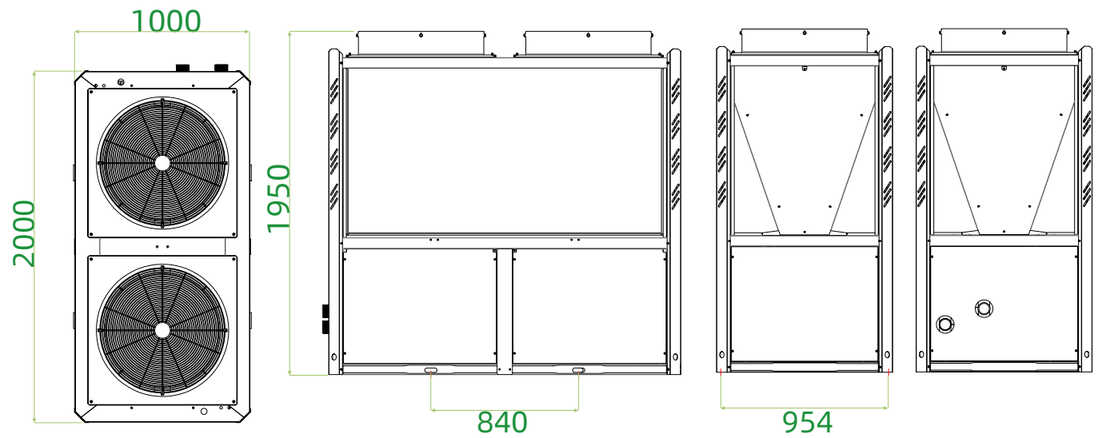

TT146II/BPN