

PHNXX



# HeatGreen

Inverter Commercial Heat Pump for  
Boiler Replacement

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# Decarbonization

Amid growing global focus on climate change, cutting carbon emissions is a shared aim. Heat pump as decarbonization efficient heating & cooling technology is vital in Europe's emission reduction. Europe's Green Deal aims 55% less by 2030 than 1990 and EU & its member states see heat pumps as key solution to reach it.

# F-gas Regulation

F-gases severely worsen global warming and harm the ozone layer, prompting the adoption of the new (EU) 2024/573 F-gas Reg., which affects commercial and industrial heat pump sector. E.g. starting from 2030, if GWP is larger than 150, hydronic heat pump and reversible water chillers with capacity more than 50KW will no longer be acceptable.

# REPowerEU

Up till now, fossil fuels still dominate and causing issues. To cut EU's fossil fuel reliance and speeding decarbonization, REPowerEU plan is driving EU's energy shift by producing more electricity from wind and solar than from gas and increasing renewable energy installation with the increased support of European Investment Bank, promoting heat pump's R&D, production, and market growth.

# Efficient Buildings

Buildings consume 40% of energy, while heat pumps can boost building energy efficiency. Under Energy Performance of Building Directive, EU aims at 60% less emission by 2030 vs 2015, and becoming the first continent to reach climate neutrality by 2050. EU states like Germany subsidize heat pumps with COP higher than 2.7 for building system upgrades, and heat pumps with natural refrigerants can receive additional 5% subsidy.



# R290

## Natural Refrigerant

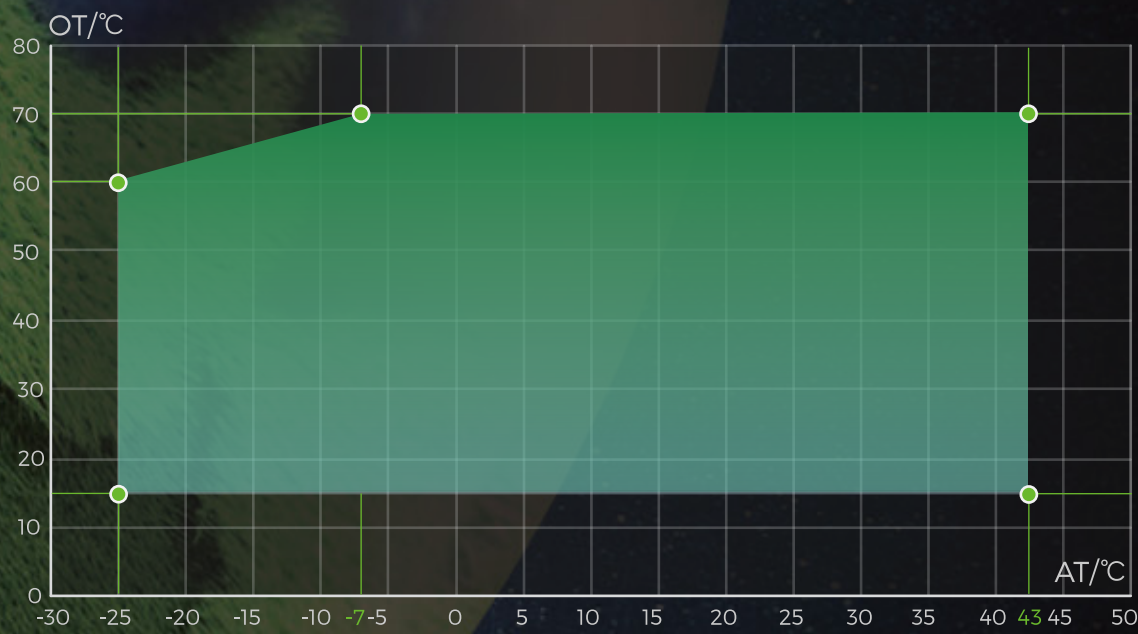
Refrigerants, essential for heat pump efficiency, pose environmental concerns due to their high global warming potential (GWP). To mitigate these negative impacts, the EU's F-gas Regulation mandates reduced emissions of these gases. The reinforced F-gases Regulation will prevent the emission of around 300 million tonnes of CO2 equivalent by 2050. It requires that new heat pumps use the most climate-friendly gases.

Moreover, BREEAM, a leading global environmental assessment for buildings, evaluates and certifies a structure's green performance. Achieving its certification can elevate property values, ease rates, and bolster a company's environmental image.

According to its scoring system, up to 2 credits can be gained in the "Impact of refrigerant" section by using a refrigerant with a GWP under 10.

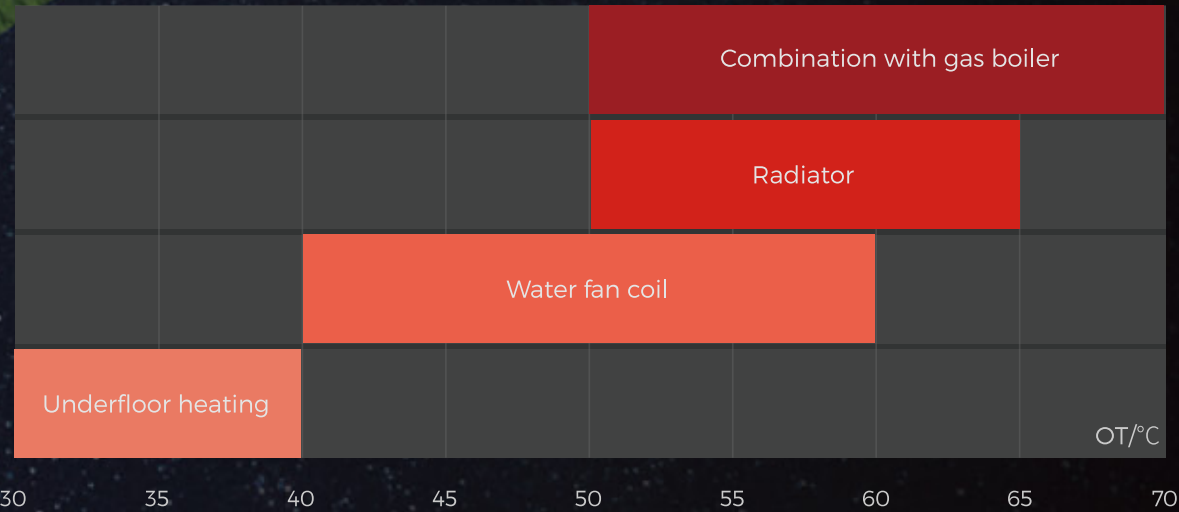
R290 Refrigerant, with its low carbon emissions and GWP, is deemed the industry's top choice. Its use aligns with carbon neutrality goals.

# Operation Envelope



Refrigerant	R744	R290	R1234yf	R454C	R454B	R513A	R32	R410A
Type	Natural	Natural	HFO	HFO	HFO	HFO	HFO	HFC
Ingredient	CO2	C3H8	CF3CF=CH2	21.5%R32+78.5%R1234yf	68.9% R32+31.1%R1234yf	44% R134a+56%R1234yf	CH2F2	50%R32+50%R125
ODP	0	0	0	0	0	0	0	0
GWP-AR4	1	3	4	148	467	631	675	2088
Boiling temperature(°C)	-62.89	-42	-29.49	-45.9	-50	-47	-51.65	-51.44
Critical temperature(°C)	30.98	96.74	94.7	82.4	76	74.9	78.11	71.34
Safety category	A1	A3	A2L	A2L	A2L	A1	A2L	A1
Temperature slip	0	0	0.16	7	1~1.1	0	0	0.1

# Extended Application





# Advanced Inverter Commercial Heating Technology & Solution



## More Efficient

All models can reach A+++ at 35°C low water temperature application and A++ at 55°C high water temperature application.

## Exhaust Temp Superheater Technology

PHNIX's patented EEV control logic maintains the exhaust temp superheater within the compressor's operating range for all climate solutions.



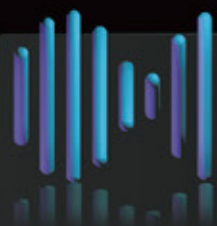
## More Comfortable

Precise control of wide water temperature range via stepless inverter compressor.

## Advanced Defrosting Technology

Adjusted-frequency control before and after defrosting enables the heat pump system to operate stably.

The Pressure and Temperature Compensation function ensures greater energy efficiency during defrosting.



## Quiet Operation

The commercial heat pump unit could be operated as quiet as possible at night for luxury villas and apartment buildings.

## Inverter Heating Technology

Enable exceptional heating performance in commercial heating and DHW applications compared to fixed-speed tandem heating technology.



## Extended Application

Up to 70°C hot water supplying can match various indoor units and work perfectly in combination with commercial gas boilers.

## Compressor Pre-heating Technology

Using pre-heating technology can extend the compressor's lifespan for entire heat pump system, especially in cold climate areas.





# Product Features

## Compact Casing Design



- A compact footprint that supports array installation can save both space and costs for commercial projects.

## Full DC Fan Motor



- Large-sized multi-blades can operate steadily and quietly via the high-efficiency full DC fan motor.

## Optimized Refrigerant Circuits Evaporator



- Anti-corrosion Golden Hydrophilic Window Aluminium Fin
- High-Efficiency Fine-toothed Internal Thread Copper Pipe

## Patented Electric Box



- IP44 Waterproof & Dustproof
- Anti-explosion

## High-efficiency SS 316 PHE



- A compact design with sufficient transferring areas to accommodate a wide range of water temperatures, from 35°C to 70°C.

## Leakage Detector



- By NDIR technology, it detects the leakage of R290 gas in the range of 0-100% LFL with high precision of  $\pm 2.5\%$  per second.



## Liquid Refrigerant Cooler

- Using liquid refrigerant to cool down the driving PCB in stable operation enhances the efficiency of the heat pump system.



## Full DC Inverter Compressor

- A full DC inverter compressor with an extended operational range can operate quietly after four layers of insulation.



## Pressure Sensor

- Input refrigerant pressure and temperature table into main PCB to monitor refrigerant system operation all the time.



## EEV

- One EEV is compatible with heating, cooling, and DHW modes.
- Dedicated multi-superheaters prevent liquid hammer even in extreme conditions.



## Liquid Refrigerant Receiver

- It can constantly provide liquid refrigerant to the evaporator for complete vaporization under all operating conditions.



## Refrigerant Exhaust Fan

- The ATEX certified fan accelerates the diffusion of R290 gas to avoid its accumulation leading to danger in case of leakage.



# Intelligent Control

- 

Smart Sliding Defrosting
- 

Weather Compensation Control
- 

Modbus RTU  
Standard RS485
- 

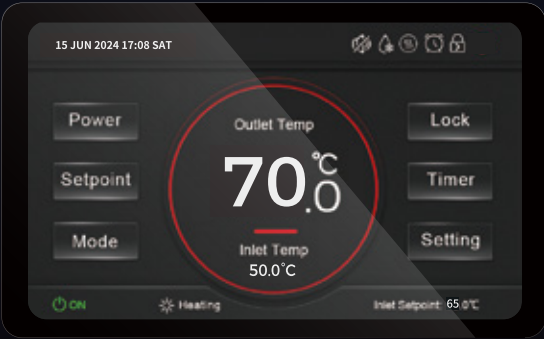
Energy Stage Control
- 

Oil Level Control
- 

Compressor Operation Envelope Protections
- 

Multiple Protections from Main PCB
- 

Multiple Protections from Inverter Compressor Module Driver



5-inch Display



7-inch Display

# 4G DTU & WiFi



## 4G-DTU & WiFi

Once this module is activated or connected to the network, data transmission will be started to upload to Cloud Server in Europe.

## Web Platform

Central platform management can be realized with DTU&WiFi module, which effectively save labor cost during the after service period.



# Significant Advantages of Centralized Control System

Phase three

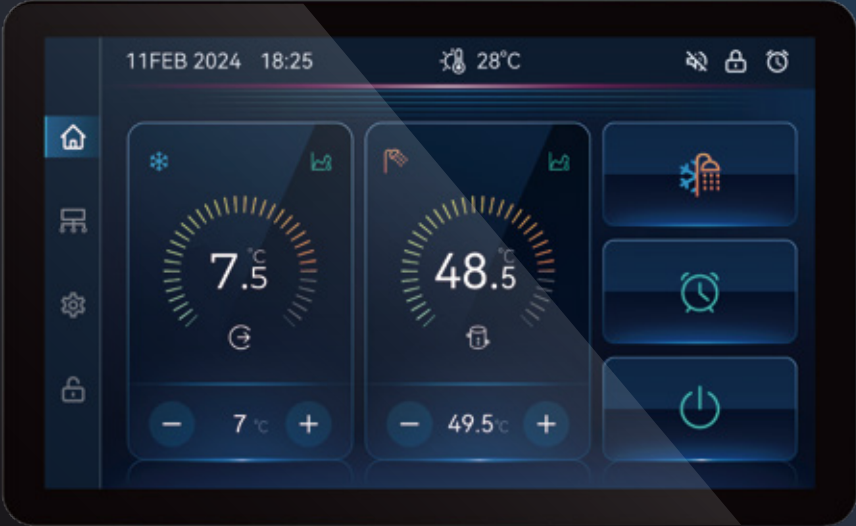
Phase two

Phase one



Having a single central display allows for the seamless coordination of modules that are added or updated at different times. This makes it easier to manage both financially and during the installation process. It also means the system can easily grow as needed and it's perfect for investment in phases.

10-inch  
Central Display



Temperature  
Period Control



Max. 16 units in  
Cascade Control



Multi-mode  
Operation



Curve Record  
Function



Smart Defrosting  
Function



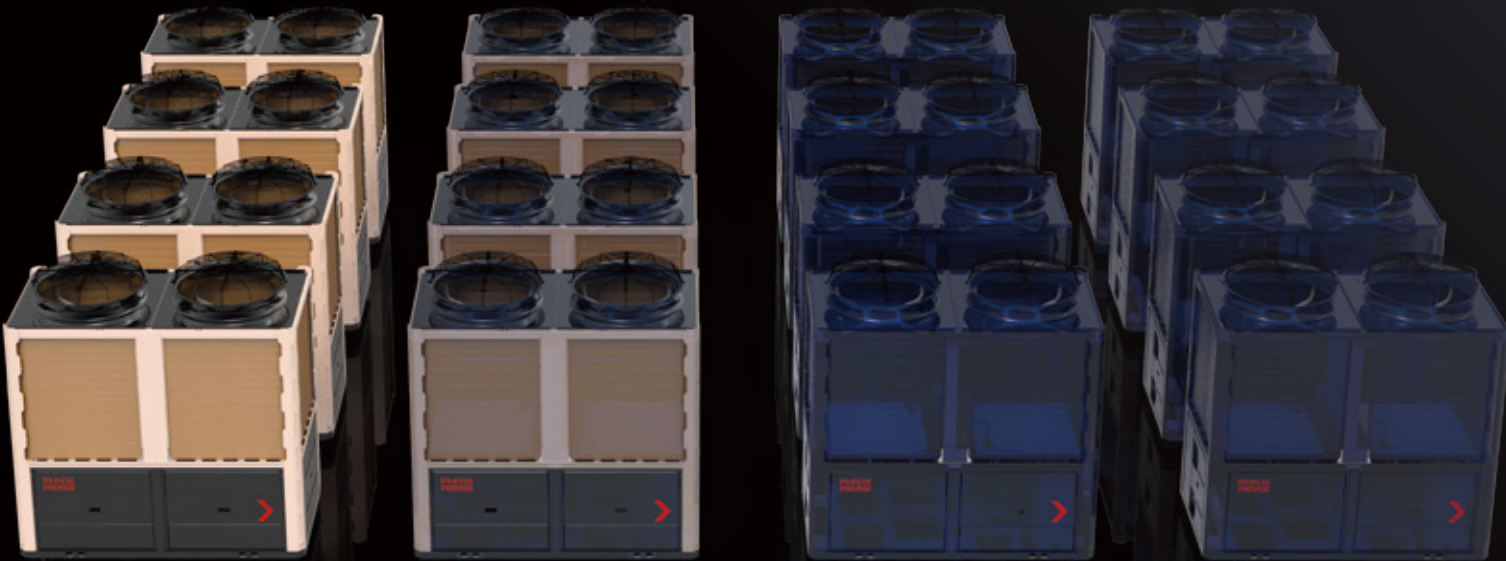
Output-adjusted  
Function



Balance Operaton  
Function



Shift Operation  
Function



1 Central Display manages Max. 16 Units

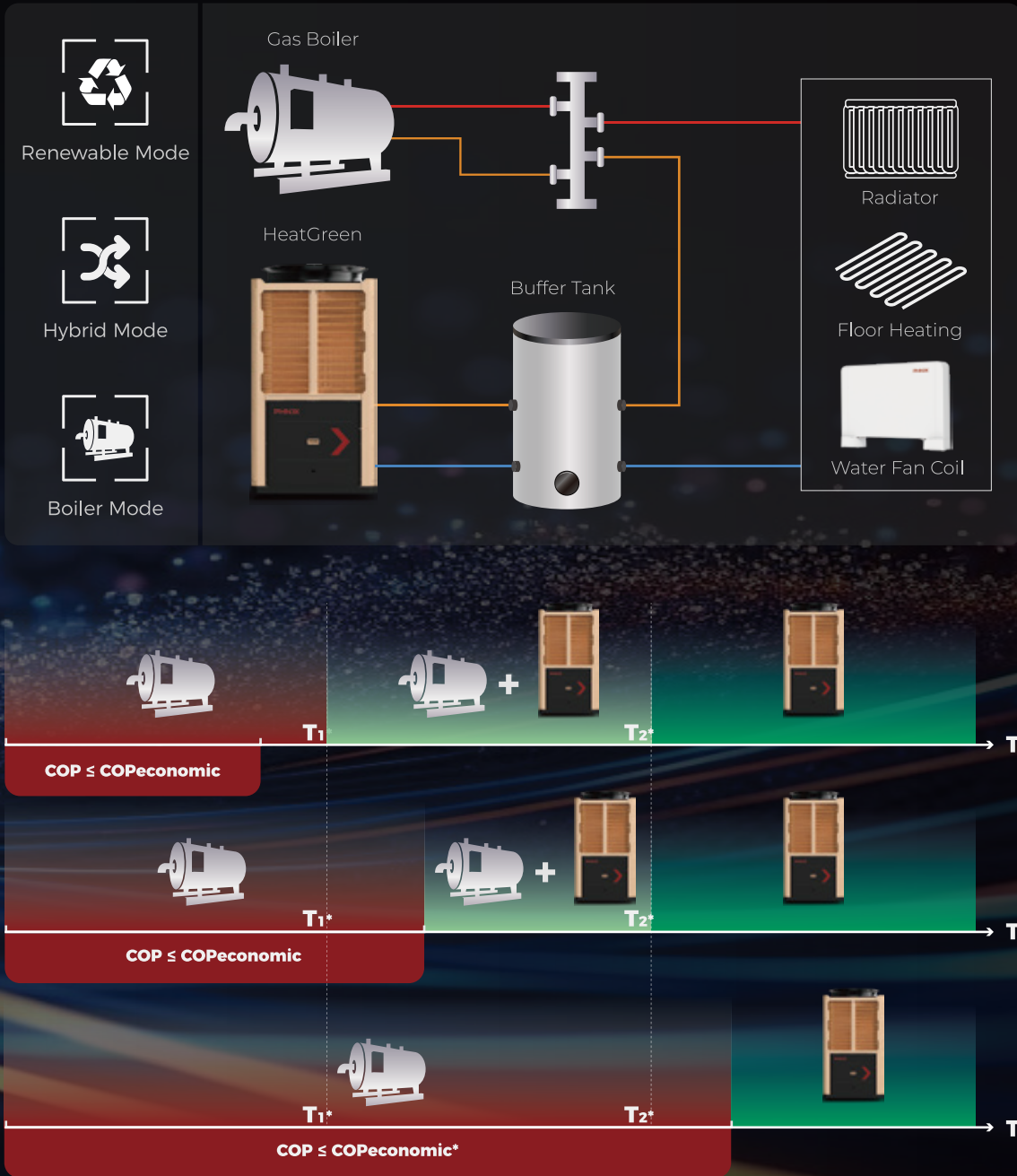


# SG Ready



# Hybrid Function

Using Hybrid function to upgrade existing heating systems can significantly reduce energy consumption and CO<sub>2</sub> emission that is a perfect choice to retrofitting commercial heating projects for non-residential buildings.



COPeconomics\*: the total heating bill for heat pump heating system will be the same with gas boiler heating system if COP(coefficient of performance) of heat pump system is equal to COPeconomic that is a parameter could be adjusted according to ratio of electricity price against gas price.  
T1\*: Compressor in heat pump system will be stopped due to low pressure protection when ambient temperature < T1;  
T2\*: The heating capacity is more than heating demand when ambient temperature ≥ T2.



# Application Areas



## Residential

- Apartment Blocks
- Dormitories
- Mansions
- Luxury Villas



## Commercial

- Office Buildings
- Shopping Centers
- Hospitals
- Hotels



## Educational

- Universities
- Libraries
- Training Centers
- Kindergartens



## Industrial

- Factories
- Warehouses
- Logistic Centers
- Data Centers

## New Commercial Construction Solution



## Future District Heating in Europe





Project Reference



Australia



Denmark



Australia



Australia



Bosnia and Herzegovina



New Zealand



Denmark



Switzerland

HeatGreen Model		PASRW080SB-BP-PS-D	PASRW150S-BP-PS-D	PASRW250S-BP-PS-D
Heating Condition 1 - Ambient Temp.(DB / WB): 7 / 6 °C, Water Inlet / Outlet 30 / 35 °C				
Nominal Capacity	kW	20.00	35.00	50.00
Heating Capacity Range	kW	8.18-28.00	13.63-50.00	20.45-75.00
Power Consumption	kW	2.29-8.27	4.36-16.00	6.54-24.00
COP Range	W/W	3.29-4.69	3.12-4.62	3.12-4.62
Current Input Range	A	3.74-13.72	6.97-25.60	10.54-38.40
Heating Condition 2 - Ambient Temp.(DB / WB): 2 / 1 °C, Water Inlet / Outlet 30 / 35 °C				
Heating Capacity Range	kW	6.27-23.00	11.07-40.60	16.16-59.27
Power Consumption	kW	2.14-7.84	3.77-13.83	5.50-20.19
COP Range	W/W	2.94-3.51	2.94-3.51	2.94-3.51
Current Input Range	A	3.26-11.97	5.76-21.13	8.40-30.84
Heating Condition 3 - Ambient Temp.(DB / WB): -7 / -8 °C, Water Inlet / Outlet 50 / 55 °C				
Heating Capacity Range	kW	4.87-17.00	8.47-30.00	12.03-43.00
Power Consumption	kW	2.96-8.88	5.34-16.29	7.63-22.80
COP Range	W/W	1.83-2.85	1.83-2.79	1.83-2.79
Current Input Range	A	4.52-13.57	8.01-23.95	11.68-35.04
Cooling Condition - Ambient Temp.(DB / WB): 35 / 24 °C, Water Inlet / Outlet 12 / 7 °C				
Cooling Capacity Range	kW	5.03-18.50	9.27-34.00	14.10-50.00
Power Consumption	kW	2.49-9.24	3.91-14.35	5.95-21.82
COP Range	W/W	1.99-3.39	1.95-3.45	1.95-3.45
Current Input Range	A	4.14-13.65	6.26-22.96	9.51-34.89
Hot Water Condition - Ambient Temp.(DB / WB): 20 / 15 °C, Water Initial / End 15 / 55 °C				
Hot Water Capacity Range	kW	8.90-38.00	16.36-70.0	23.22-100.00
Power Consumption	kW	2.75-10.50	5.29-19.40	7.51-27.54
COP Range	W/W	3.31-4.58	3.21-4.65	3.21-4.65
Current Input Range	A	4.60-17.00	8.22-30.14	11.67-42.80
Max.Hot Water Capacity	L/h	817	1505	2150
ErP Level(35 °C)	/	A+++	A+++	A+++
ErP Level(55 °C)	/	A++	A++	A++
Max.Power Input	kW	13	24	36
Max.Current Input	A	17	30	45
Power Supply	V/Ph/Hz	380-415V / 3N- / 50-60Hz	380-415V / 3N- / 50-60Hz	380-415V / 3N- / 50-60Hz
Sound Pressure (1m)	dB(A)	51	53	56
Sound Power Level (EN12102)	dB(A)	66	69	73
Operating Ambient Temperature	°C	-25-43	-25-43	-25-43
Max.Outlet Water Temperature	°C	70	70	70
Fan Motor Quantity	/	2	1	2
Fan Motor Type	/	DC Fan Motor	DC Fan Motor	DC Fan Motor
Water Connection	inch	G1.25'	G1.5'	DN50
Water Pressure Drop(Max.)	kPa	50	20	25
Rated Water Flow	m³/h	3.4	6.0	8.6
Circulation Pump Water Head	m	12.5	/	/
Refrigerant Charge	g	1800	1500*2	2400*2
C02 Equivalent	Ton	0.0055	0.0092	0.01472
Net Weight	kg	202	490	733
Gross Weight	kg	223	560	833
Unit Dimension(L/W/H)	mm	1350 / 540 / 1330	1195 / 980 / 1921	1965 / 1170 / 2000
Shipping Dimension(L/W/H)	mm	1370 / 560 / 1350	1195 / 980 / 2150	1995 / 1200 / 2100
Loading Quantity in 40HQ	pcs	28	18	11