

Functions



ForestPro Series

R290 DC Inverter Air Source Heat Pumps with CAREL Touch Screen Controller



Multiple Modes for Comfortable Use



Max. Outlet Water Temperature



ERP A+++ Performance



Stable Running Ambient



Built-in Electric Energy Metering Module



Built-in Water Pump



CAREL Touch Screen Controller



SG Ready



Uw partner in duurzame energie.

Features & Functions

-  CAREL Intelligent System
-  High Safety Performance
-  Trendy and Stylish Looks
-  Energy Saving
-  Noise Reduction Technology

R290 refrigerant :
GWP3.3 (Global warming potential) ,lower than R410A
More suitable for cold environment

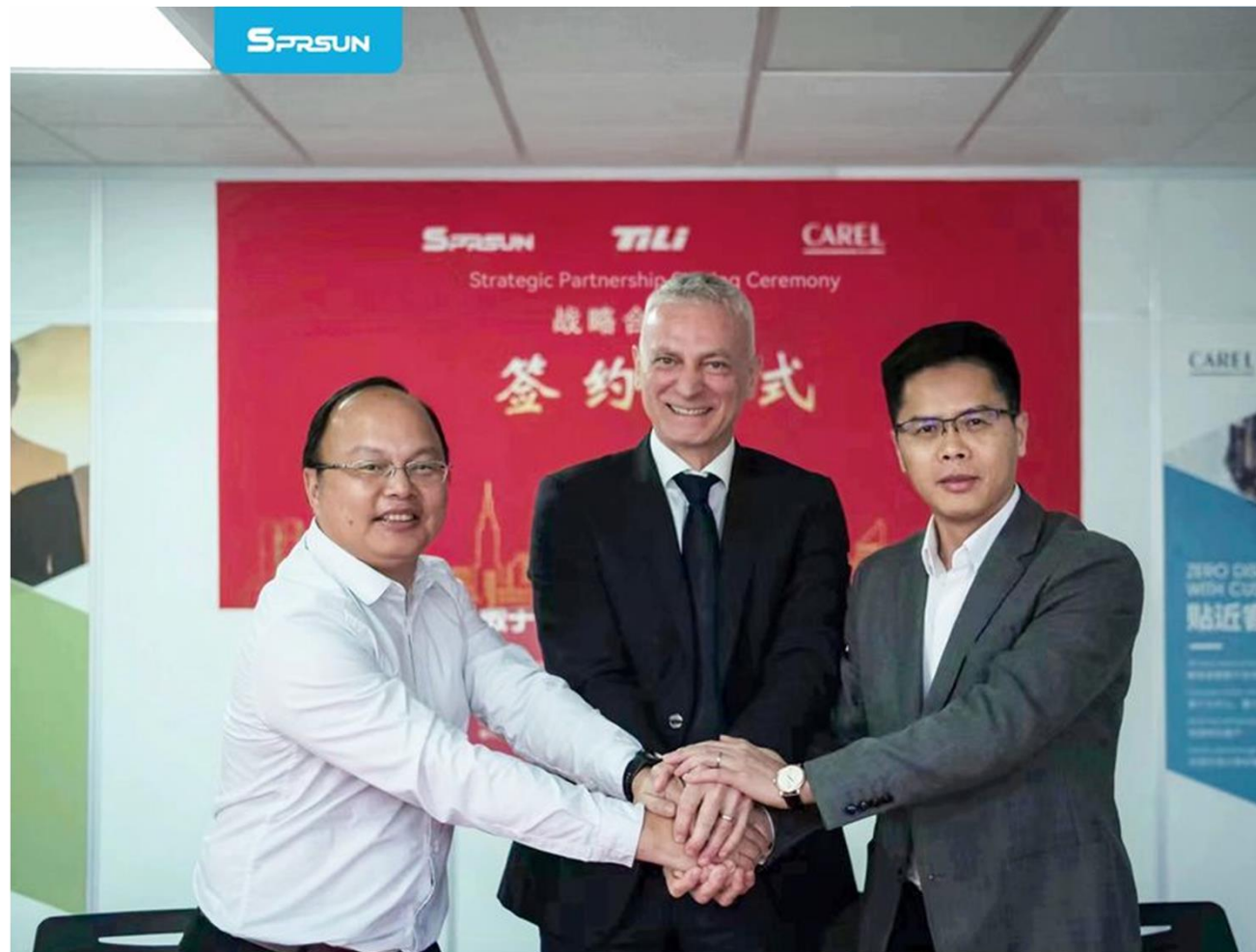


The refrigerant



Refrigerant	R290	R32	R410A	R22
Global Warming Potential (GWP)	3.3	657	2088	1810
Energy efficiency Energie-Effizienz	High	High	Moderate	Low
Flammability Entflammbarkeit	High	Low	Moderate	Moderate
Security Level Sicherheitsstufe	A3	A2	A1	A1
Pressure Druck	Low	Low	High	High
Cost Kosten	Low (Injection volume only 40%~55% of R22/R410a)	Low	Moderate	High

Branded Component Partners



**SPRSUN and CAREL enter into
a strategic partnership
(Signing Ceremony)**



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01

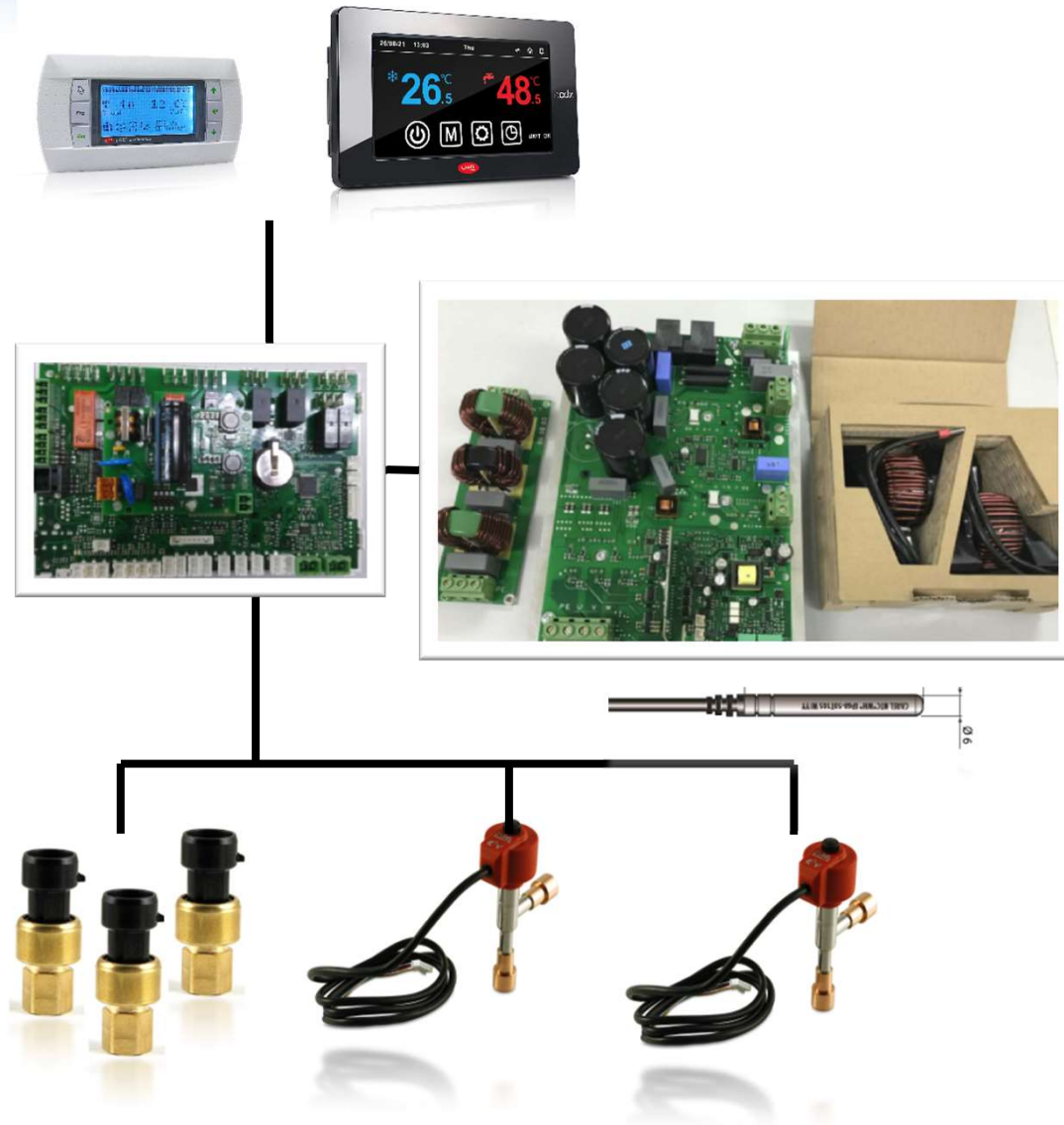
Carel Controller Strength

CAREL - Founed in 1973

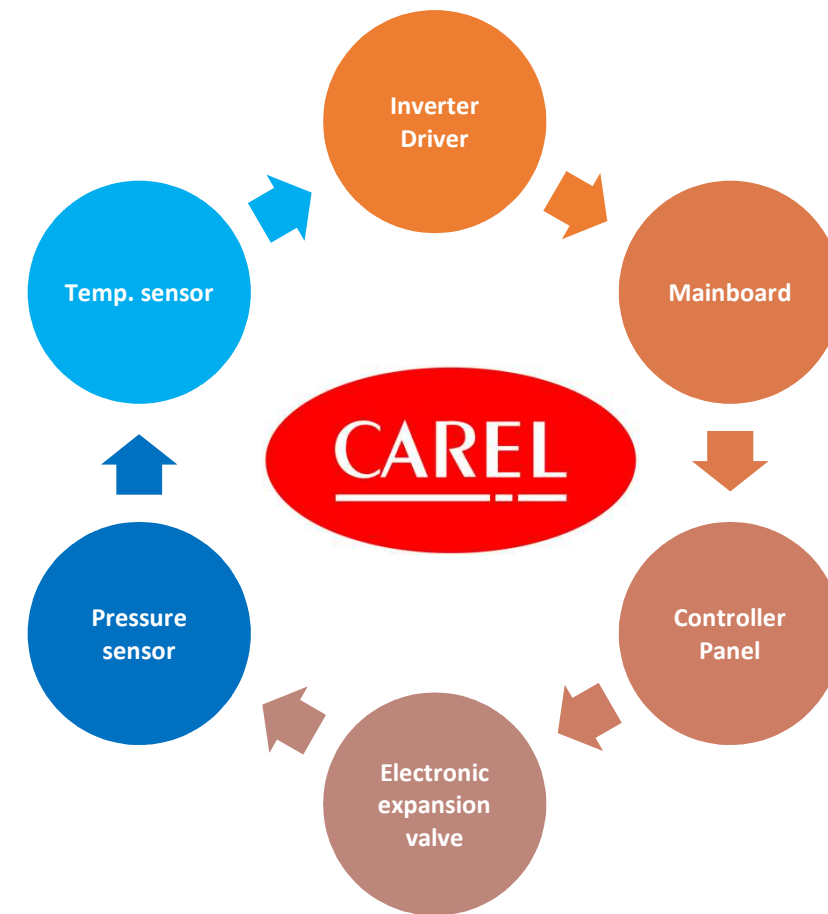


CAREL is a reputable manufacturer of controllers and solutions for air-conditioning, refrigeration, and heating applications.

One Stop Solution



- Wide supply voltage range: 145V~265V
- More than 10 years lifespan



WHAT ARE THE STRENGTHS OF CAREL CONTROLLER COMPARED WITH OTHER BRAND?

More Aesthetic

- 4.3" or 7.1" Colorful Touchscreen
- Customizable boot interface logo

More Stable

- More mature hardware solutions
- More complete protection measure
- Supports the highest frequency operation
- Wide supply voltage range: 145V~265V

More Energy-saving

- More precise control
- Improve energy efficiency

More Recognition

Positioned as a high-end brand with high visibility, helping you gain more customer recognition.

Other features



Real-time Monitor

The CAREL controller can monitor the working situation of the heat pump in real-time and issue an alarm in time when abnormalities are found.

More than 10 years lifespan

Allow the heat pump to operate within a safe range and greatly improves the service life.

Wi-Fi APP and PC Background

Through the intelligent touch screen and Wi-Fi control, the heat pump can be operated at APP. Support customize.

Integrated Power Tracking Feature

It can display the current input power, monthly power consumption and total power consumption.

1. High security accessories

Explosion-proof relays (suppression of ignition sources)

Compared with ordinary relays, explosion-proof glue is used to seal, so that external gas cannot enter the interior of the relay and cannot become the ignition source of the explosion.



**EX explosion
proof marking**

1. High security accessories

Explosion-proof electronic expansion valve coil

- 1、 Compared with ordinary coils, the inside of the shell is potted with glue, blocking the external gas from entering its inside;
- 2、 compared with the ordinary coil tpv rubber material, the shell use PC material, PC material has good heat resistance, cold resistance and corrosion resistance, can maintain stability and mechanical properties at higher and lower temperatures, not easy to rupture.
- 3、 the cable is changed to a high temperature resistant and low temperature resistant material.



**EX explosion
proof marking**

2. Enhanced Sealing Techniq

Panasonic specific R290 DC inverter compressor (not EVI) **with sealing at the terminals;**



Panasonic

Compressor
Panasonic Rotary Compressor

R290冷媒双螺栓上盖机种附件安装手順

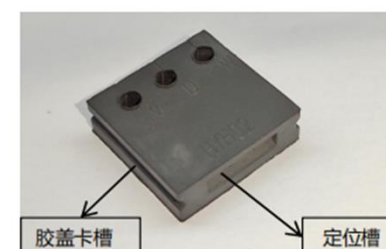
一、接线端附件部品详细



胶盖



垫片



胶盖卡槽

定位槽

密封塞



螺母

二、安装手順



1、垫片安装



2、U相线安装
(标识面朝外)



3、W/V相线安装



6、螺母紧固



5、胶盖安装
(对齐密封塞胶盖卡槽)



4、端子安装&密封塞定位
(定位槽对齐垫片定位凸起)



2. Enhanced Sealing Technique



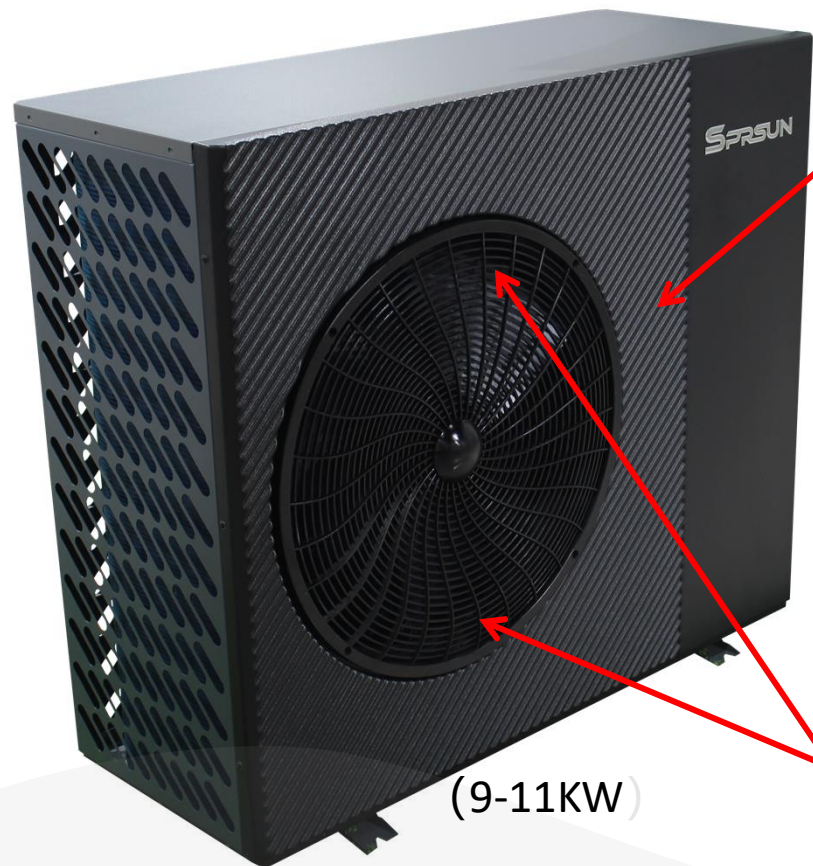
In the whole machine without pressure gauge structure, the needle valve adopts the hard sealing method, which reduces the risk of refrigerant leakage.

1. CAREL Intelligent System



The **mobile phone APP** and **the PC background** both can be opened to users. It can be used for remote control, after-sales inspection, data optimization, etc.

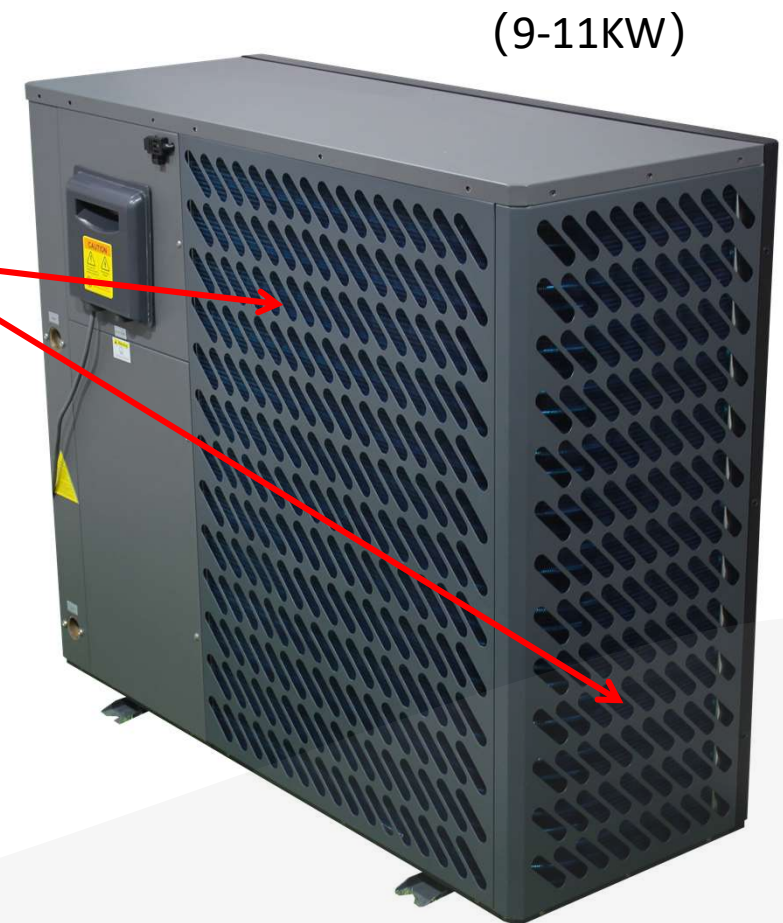
2. Trendy and Stylish Looks



(9-11KW)

1) Front panel is made of blister panel, rear and side mesh panels are made of sheet metal, which is three-dimensional and beautiful, and can support higher requirements for customized appearance.

2) Spiral injection molded mesh cover, in line with the aerodynamic shape, beautiful appearance, conducive to the flow of noise reduction.



(9-11KW)

3. Trendy and Stylish Looks

3) The ambient probe mount is placed on the exterior of the sheet metal to reduce frosting miscalculations.

4) Large plastic handle on the rear panel for easy access to power cables and maintenance.

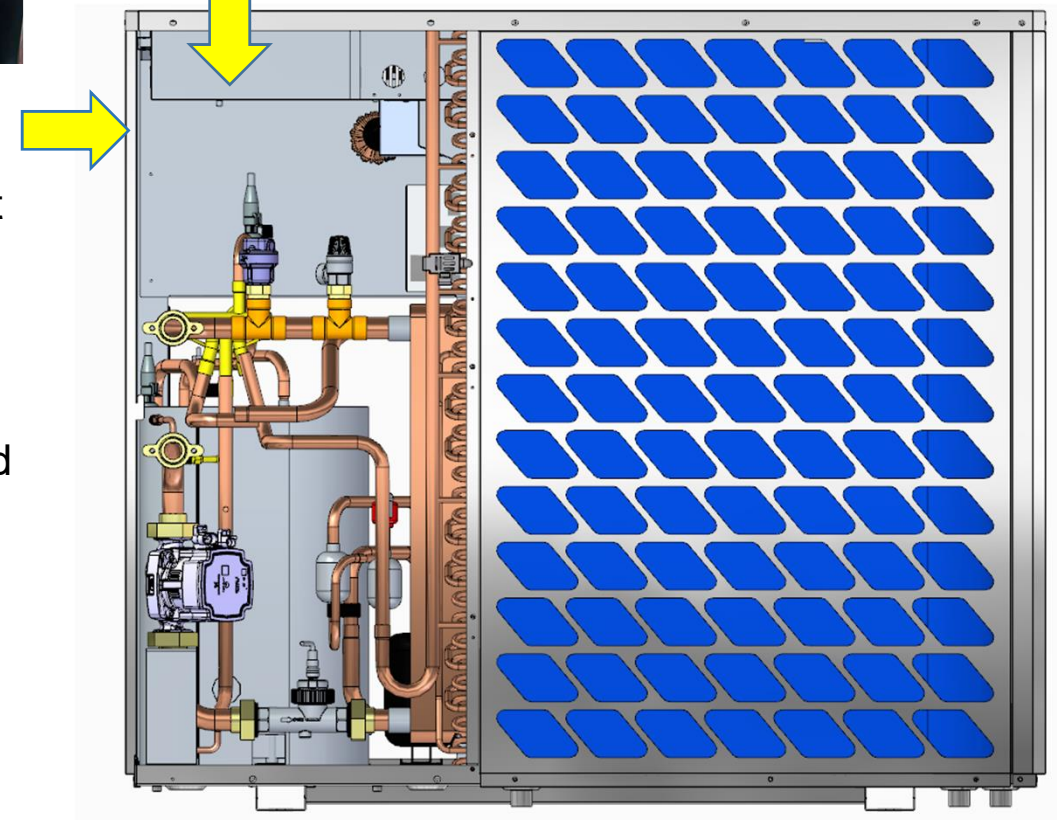


3. Improved Structural Design

Explosion-proof design in the design of the structure of heat pump (built-in discharge valve and pressure relief valve can be produced in the plate in the leakage or ice blasts (low risk), to prevent the refrigerant into the indoor become potential hazards:



(1) Built-in pressure relief valve: When there is a refrigerant leak, the water pressure may increase instantaneously, and a large amount of refrigerant can be discharged through this time

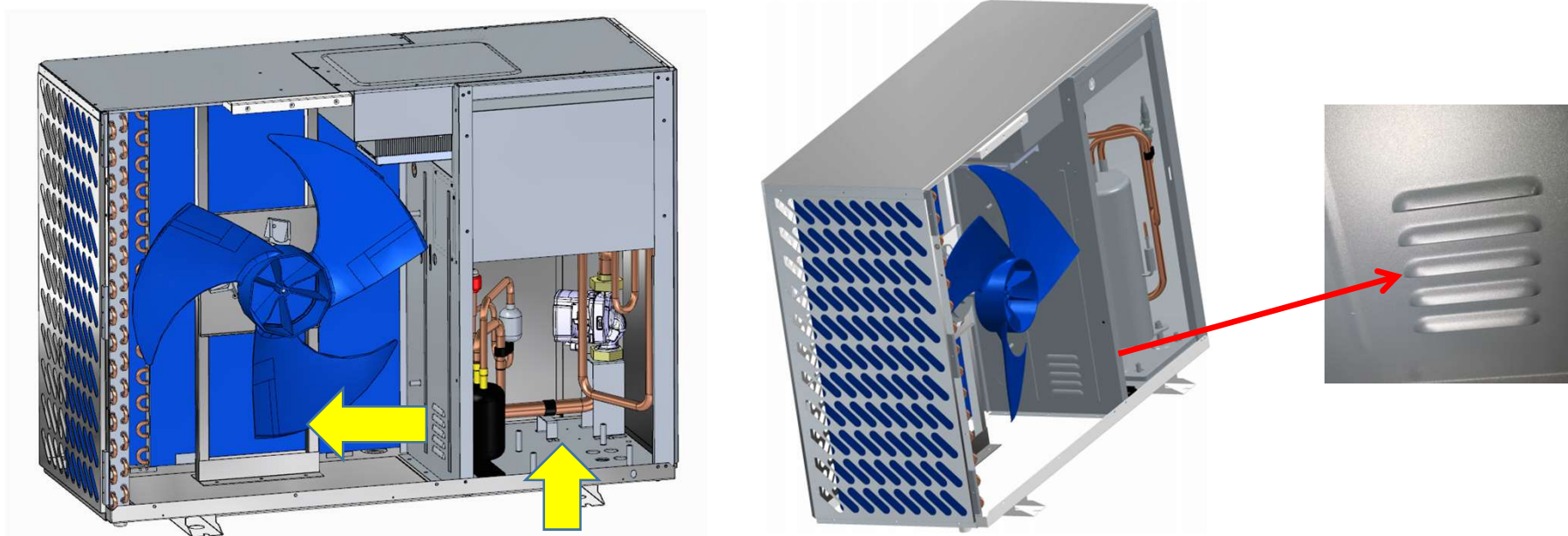


(2) After a large amount of refrigerant is discharged through the pressure relief valve, a small amount of refrigerant is discharged through the exhaust valve, which ensures that no large amount of refrigerant will leak into the room in case of leakage.

3. Improved Structural Design

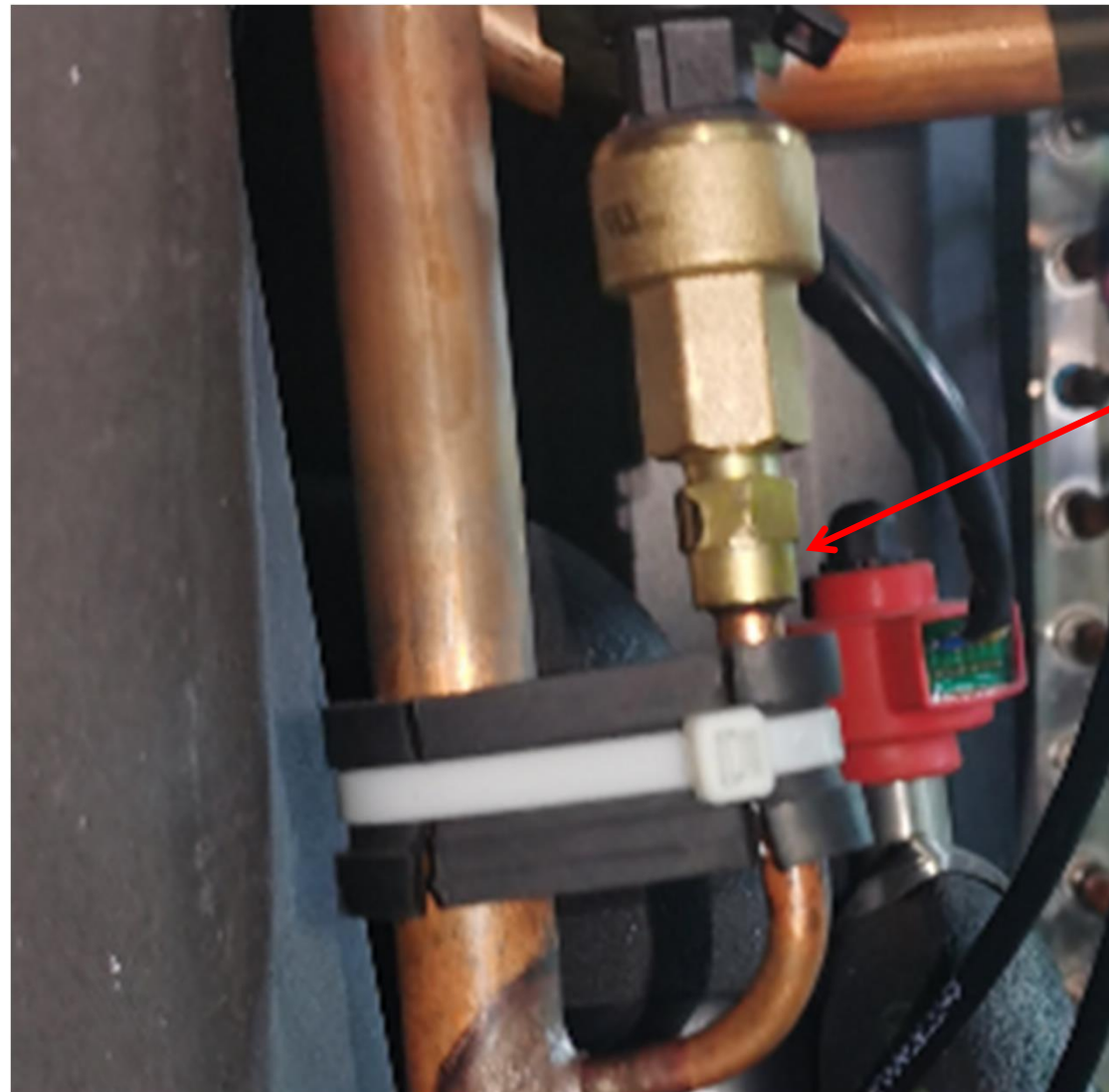
Explosion proof design in heat pump structure design (enhanced ventilation):

Add ventilation louvers at the bottom of the middle partition to increase air flow and reduce the formation of combustion and explosion conditions inside the machine caused by refrigerant leakage.



Summary: Through hardware and spatial design, the necessary conditions include c, specific concentration range (2.1% -9.5%), and d, ignition source (≥ 450 °C); It is difficult to form and meet our safety design requirements

3. Improved Structural Design



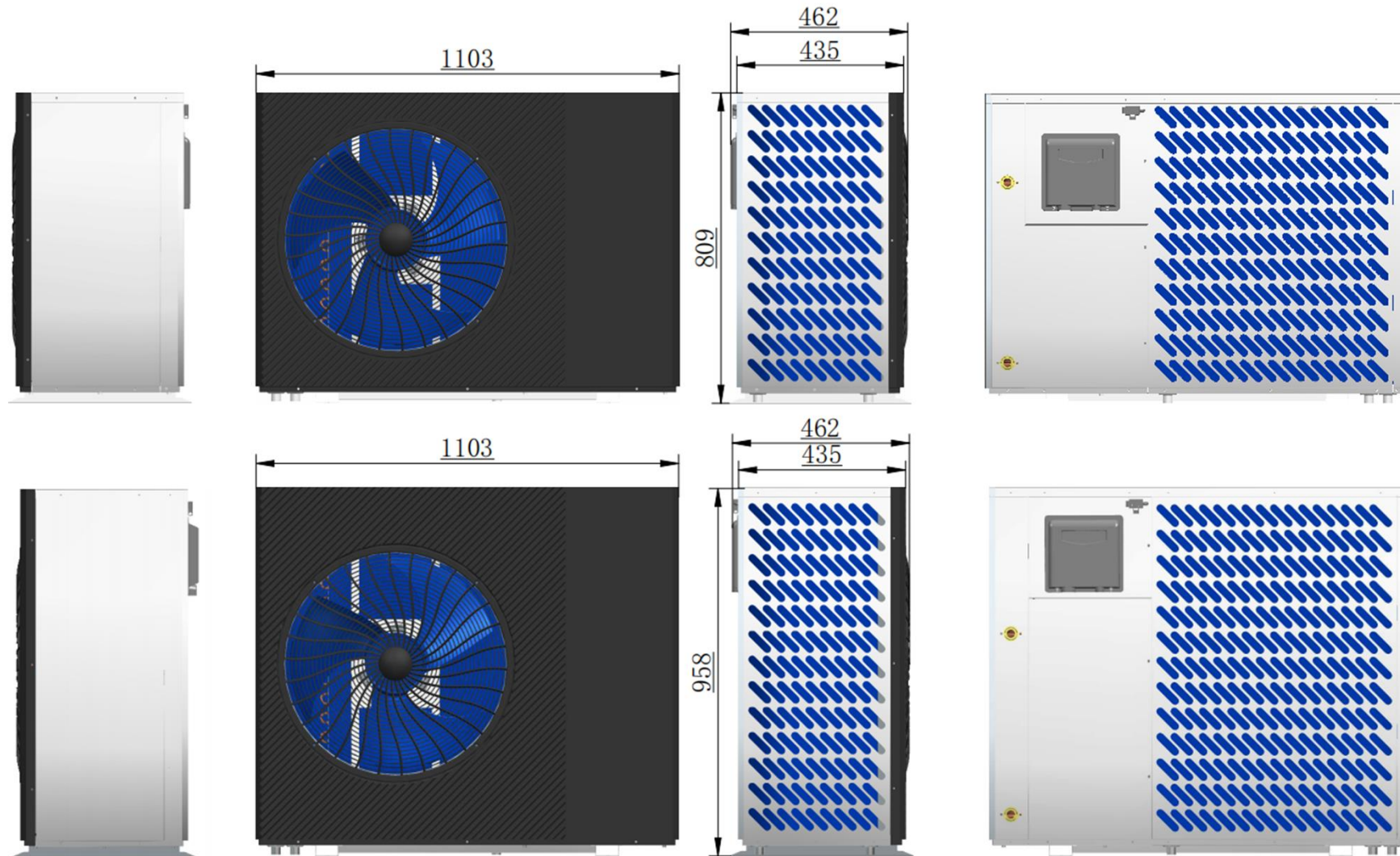
Reduces vibration and prevents air leaks

Verringert Vibrationen und verhindert Luftleckagen.

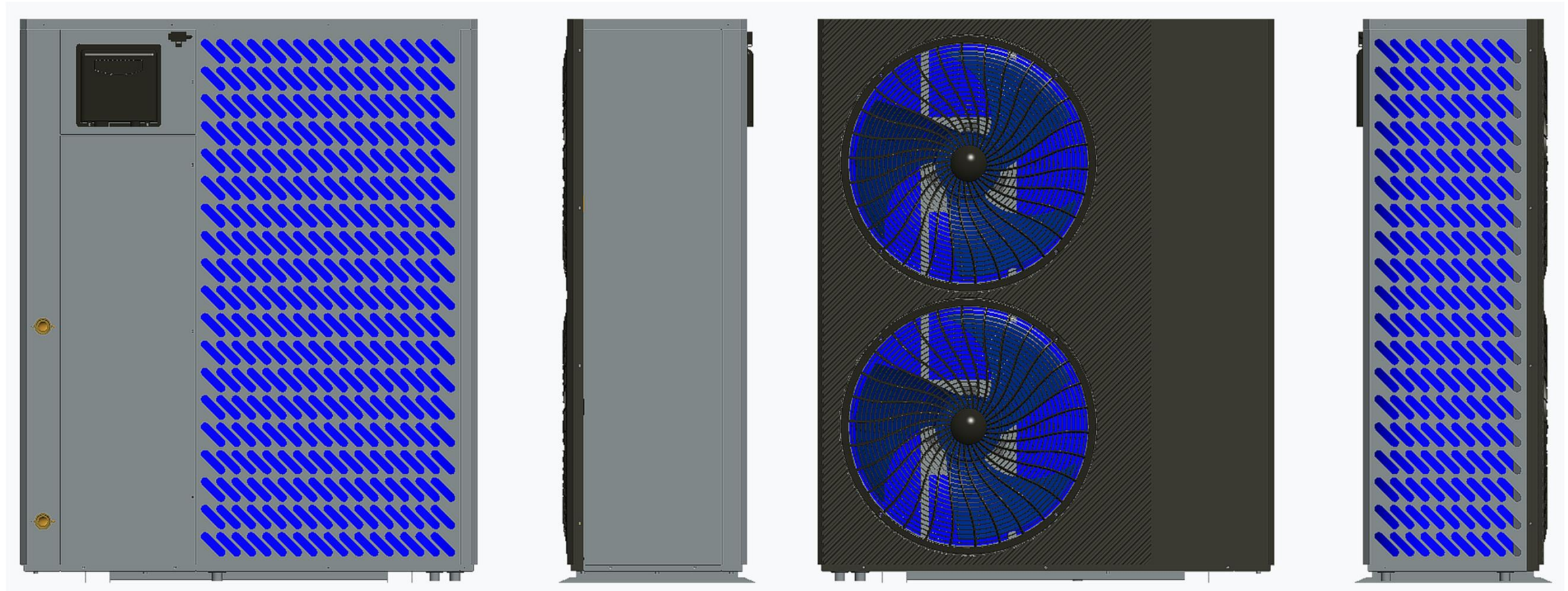
At the compressor vibration source, the low and high pressure pressure sensor needle valves are added with double hole rubber fixing blocks to reduce the risk of pipeline vibration breakage.

4. Product appearance

9-11KW



5. Product appearance 15-18KW



R290 Series-Features

3. High Safety Performance

Top-notch Parts

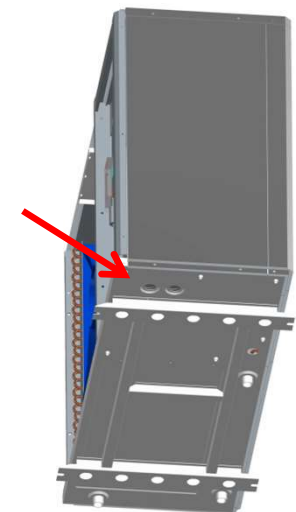
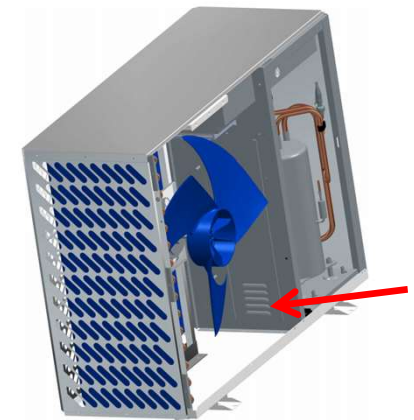
By using high-quality components such as Panasonic R290 Dedicated Safety Compressor, CAREL Anti-Explosion Electronic Expansion Valve and Grundfos Safe Water Pump to ensure the stable operation and safety of the heat pump.

Enhanced Sealing Technique

In the structure of the whole machine without a pressure gauge, the needle valve adopts a hard sealing method to reduce the risk of refrigerant leakage;

Improved Structural Design

The middle partition opens louvers, and the chassis opens convection holes to increase the air convection in the press compartment to avoid the leakage of refrigerant from the fluorine circuit to reach the explosive concentration.



4. Noise Reduction Technology

Day & Night Modes

With different operation in different modes, allowing for low operation and low noise in night mode for a more comfortable environment.

Noise reduction design

Spiral injection molding mesh cover, in line with the air-fluid mechanics shape, beautiful appearance, conducive to the inflow of noise reduction.

All-round Noise Reduction

Coupled with the press double noise reduction (two layers of compressor silencing cotton) so that the heat pump work more quietly.



5. Energy Saving

GWP3.3

- With global warming potential (GWP) as low as 3.3, SPRSUN R290 A+++ energy consumption makes it possible to consume less energy, helping households to reduce their energy bills, and to consume different amounts of energy for different needs, making it more energy efficient than other heat pumps.

SG-Ready

- The integration of a "SG-Ready" (Smart-Grid-Ready) heat pump is an advanced form of sector coupling of electricity and heat - often also called "Power-to-Heat" application. The control ensures that the heat pump slightly overheats the thermal storage at times when PV surplus electricity is available, in order to then save electrical energy at times when there is no cheap surplus electricity.

Max. Outlet Water 75°C

- By combining eco-friendly R290 natural refrigerant and inverter heating technology, the new heat pump is able to operate from -25°C to 45°C, maintaining high COP and reliable stability. More importantly, its max. outlet water temperature reaches 75°C without electric heating.





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Built-in Water Pump



CAREL Touch Screen Controller



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Ow partner in duurzame energie.

Specifications



Model		CGK030V4P	CGK040V4P	CGK050V4P	CGK060V4P	CGK-030V4P	CGK-040V4P	CGK-050V4P	CGK-060V4P
Power Supply	V/Hz/Ph	220-240/50/1				380-420/50/3			
Heating condition: water inlet/outlet temperature: 30°C /35°C , Ambient temperature: DB 7°C /WB 6°C ;									
Max. Heating Capacity	kW	9	11	15	18	9	11	15	18
C.O.P	W/W	4.14	4.18	4.06	4.12	4.14	4.18	4.06	4.12
Heating Capacity Min./Max.	kW	4.14/9.00	5.06/11.00	6.90/15.00	8.28/18.00	4.14/9.00	5.06/11.00	6.90/15.00	8.28/18.00
Heating Power Input Min./Max.	W	787/2174	953/2632	1307/3695	1489/4369	787/2174	953/2632	1307/3695	1489/4369
C.O.P Min./Max.	W/W	4.14/5.26	4.18/5.31	4.06/5.28	4.12/5.56	4.14/5.26	4.18/5.31	4.06/5.28	4.12/5.56
Heating condition: water inlet/outlet temperature: 40°C /45°C , Ambient temperature: DB 7°C /WB 6°C ;									
Max. Heating Capacity	kW	8.4	10.2	13.7	17.2	8.4	10.2	13.7	17.2
C.O.P	W/W	3.41	3.65	3.50	3.61	3.41	3.65	3.50	3.61
Heating Capacity Min./Max.	kW	3.87/8.42	4.71/10.23	6.28/13.65	7.91/17.19	3.87/8.42	4.71/10.23	6.28/13.65	7.91/17.19
Heating power input Min./Max.	W	969/2467	1166/2800	1565/3900	1871/5215	969/2541	1166/3059	1565/4203	1871/5215
C.O.P Min./Max.	W/W	3.41/4.00	3.65/4.03	3.50/4.01	3.30/4.23	3.31/4.00	3.34/4.03	3.25/4.01	3.30/4.23
Cooling condition: water inlet/outlet temperature: 23°C /18°C , Ambient temperature: DB35°C /WB24°C ;									
Max. Cooling Capacity	kW	8.0	9.7	13.0	16.3	8.0	9.7	13.0	16.3
E.E.R	W/W	3.31	3.54	3.39	3.50	3.31	3.54	3.39	3.50
Cooling Capacity Min./Max.	kW	3.68/7.99	4.47/9.72	5.97/12.97	7.51/16.33	3.68/7.99	4.47/9.72	5.97/12.97	7.51/16.33
Cooling Power Input Min./Max.	W	939/2416	1131/2742	1517/3820	1813/4659	939/2416	1131/2742	1517/3820	1813/4659
E.E.R Min./Max.	W/W	3.31/3.92	3.54/3.95	3.39/3.93	3.50/4.14	3.31/3.92	3.54/3.95	3.39/3.93	3.50/4.14
Cooling condition: water inlet/outlet temperature: 12°C /7°C , Ambient temperature: DB35°C /WB24°C ;									
Max. Cooling Capacity	kW	6.3	7.7	10.2	12.2	6.3	7.7	10.2	12.2
E.E.R	W/W	2.42	2.59	2.48	2.56	2.42	2.59	2.48	2.56
Cooling Capacity Min./Max.	kW	2.90/6.31	3.53/7.67	4.71/10.24	5.61/12.20	2.90/6.31	3.53/7.67	4.71/10.24	5.61/12.20
Cooling Power Input Min./Max.	W	842/2613	1014/2966	1361/4131	1540/4770	842/2613	1014/2966	1361/4131	1540/4770
E.E.R Min./Max.	W/W	2.42/3.45	2.59/3.48	2.48/3.46	2.56/3.65	2.42/3.45	2.59/3.48	2.48/3.46	2.56/3.65
Max Power Input	kW	3.26	3.95	5.54	6.55	3.26	3.95	5.54	6.55
Max Current	A	15.60	18.89	26.52	31.36	6.88	8.33	11.69	13.83
Wire diameter	mm ²	4.0	6.0	6.0	6.0	2.5	2.5	4.0	4.0
Fuse or circuitbreaker	A	25A	32A	40A	40A	13A	16A	20A	20A
Max Water Pump Head	m	9	9	10.5	10.5	9	9	10.5	10.5
Allowable Water Flow	Min./Rated./Max. L/S	0.27 /0.43 /0.72	0.33 /0.53 /0.88	0.45 /0.72 /1.19	0.54 /0.86 /1.43	0.27 /0.43 /0.72	0.33 /0.53 /0.88	0.45 /0.72 /1.19	0.54 /0.86 /1.43
Sound Pressure (1m)	dB(A)	46	46	46	46	46	46	46	46
Sound power Level	dB(A)	60	60	60	60	60	60	60	60
Refrigerant		R290							
ErP Level(35° C)	/	A+++							
Cabinet Type	/	Weather-resistant pp+Galanizedsheet metal+ASA							
Net Weight	kg	85	105	124	124	88	105	124	124
Carton gross Weight	kg	105	120	150	150	105	120	150	150
Net Dimension(L*D*H)	mm	1110*475*810	1110*475*960	1110*475*1355	1110*475*1355	1110*475*810	1110*475*960	1110*475*1355	1110*475*1355
Carton packing Dimension(L*D*H)	mm	1165*505*960	1165*505*1100	1165*505*1520	1165*505*1520	1165*505*960	1165*505*1100	1165*505*1520	1165*505*1520

R290 Heating Capacity at Different Conditions

Model	CGK030V4P/CGK-030V4P			CGK040V4P/CGK-040V4P			CGK050V4P/CGK-050V4P			CGK060V4P/CGK-060V4P		
Air temp °C	Heating capacity (KW)			Heating capacity (KW)			Heating capacity (KW)			Heating capacity (KW)		
-15	4.78	4.51	4.32	6.90	6.07	5.59	8.08	7.65	7.18	10.40	9.80	9.30
-7	6.13	5.87	5.45	8.11	7.63	6.99	10.25	9.56	8.97	12.80	12.20	11.90
-2	7.13	6.85	6.35	8.91	8.48	8.22	11.48	11.13	10.56	13.78	14.07	12.67
2	7.92	7.40	7.20	9.90	8.96	8.82	13.05	12.11	11.05	15.66	15.35	14.90
7	9.00	8.40	8.20	11.00	10.20	10.03	15.00	13.65	12.55	18.00	17.23	16.60
12	10.11	9.68	9.20	12.10	11.72	11.20	16.50	15.68	14.43	19.80	18.82	17.80
20	11.20	10.53	10.11	13.55	12.74	10.36	18.15	17.42	15.69	20.00	18.84	17.60
Hot water temp °C	30/35	40/45	50/55	30/35	40/45	50/55	30/35	40/45	50/55	30/35	40/45	50/55
Model	CGK030V4P			CGK040V4P			CGK050V4P/CGK-050V4P			CGK060V4P/CGK-060V4P		
Air temp °C	COP (kW/kW)			COP (kW/kW)			COP (kW/kW)			COP (kW/kW)		
-15	2.55	2.23	1.89	2.95	2.61	2.35	2.40	2.08	1.79	2.52	2.22	1.81
-7	3.00	2.90	2.25	3.30	2.93	2.38	2.92	2.58	2.04	3.05	2.61	2.20
-2	3.55	3.05	2.56	3.55	3.05	2.56	3.32	3.05	2.56	3.32	3.05	2.35
2	3.84	3.25	2.63	3.95	3.29	2.80	3.65	3.03	2.42	3.70	3.07	2.42
7	4.25	3.66	2.93	4.30	3.70	3.11	4.15	3.57	2.72	4.20	3.61	2.95
12	4.63	4.09	3.18	4.80	4.14	3.28	4.77	4.00	3.02	4.70	4.05	3.15
20	5.23	4.58	3.44	5.28	4.64	3.20	5.35	4.48	3.30	5.50	4.53	3.50
Hot water temp °C	30/35	40/45	50/55	30/35	40/45	50/55	30/35	40/45	50/55	30/35	40/45	50/55

Key Component



Controller
CAREL Touch screen Controller 4.3



Condenser
Plate Heat Exchanger



Expansion valve
CAREL Electronic Expansion valve



Compressor
Panasonic Rotary Compressor



Water Pump
Grundfos



4-way valve
SANHUA



ForestPro Series
R290 DC Inverter Air
Source Heat Pumps with
CAREL Touch Screen
Controller

SPRSUN

Other Heat Pumps

SPRSUN R290

CAREL Controller Heat Pump



Integrated Control

Multiple heat pumps can be connected in series and controlled by a single controller.

Intelligent Defrosting

Automatically defrosts when necessary, saving energy.

Wi-Fi Online Control

Connect via Wi-Fi and control the system using an app.

Integrated Power Tracking Feature

Stylish and user-friendly with a responsive interface.

Smart Touchscreen

Stylish and user-friendly with a responsive interface.

Multi-functional

Provides hot water, cooling, and heating functions with a one-button switch.

PK

Individual Control

- One controller can only operate one unit, otherwise, modifications may be required.

Timed defrosting

May lead to defrosting misjudgement, resulting in increased energy consumption.

Panel Control

Inconvenient operation.

No Energy Usage Data

Uncertain about energy consumption.

Button Controller

Difficult to Use
Unresponsive



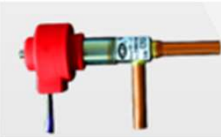
Single Mode

Only for heating or only for hot water supply.

CAREL control system

Carel full DC inverter controller kit (**explosion-proof motherboard, explosion-proof**), Carel 4.3-inch touch screen;



	<p>controller</p>	<p>Special HVAC PLC, programmable controller</p> <p>Compared with the performance of home PCB control board, the performance is more stable, and the communication anti-interference ability is stronger.</p> <p>The program supports customization</p> <p>Local integration of two RS485 communication ports and a PLAN card internal communication port, additional support for communication card expansion.</p> <p>UL compliant</p>
	<p>inverter</p>	<p>With the Carel controller, the specific compressor running diagram envelope control can be realized, which can ensure that the compressor always runs in a safe and stable area.</p> <p>Simply select the compressor type on the operator, and the program automatically downloads the corresponding compressor parameters to the inverter.</p> <p>PS2 Series meets UL certification</p>
	<p>electronic expansion valve</p>	<p>High protection standard IP67</p> <p>Conforms to 1 million times full on/off life test</p> <p>Highly accurate performance curves in equal percentages</p> <p>Can be completely shut down without the need for additional solenoids</p> <p>UL compliant</p>

Remote Control with APP and PC Platform

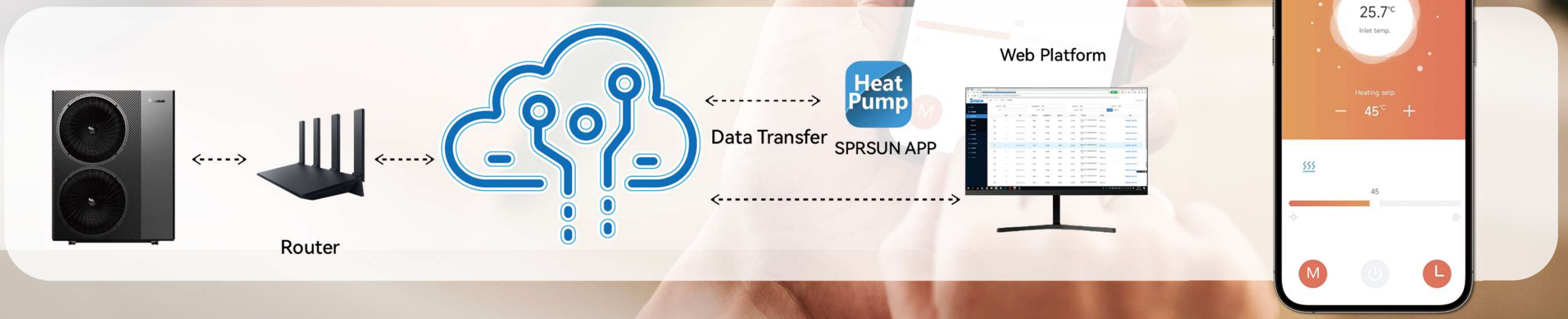
Fernsteuerung mit APP und PC-Plattform

Deploy SPRSUN remote server in Munich, Germany, which can support 1 million devices online at the same time.

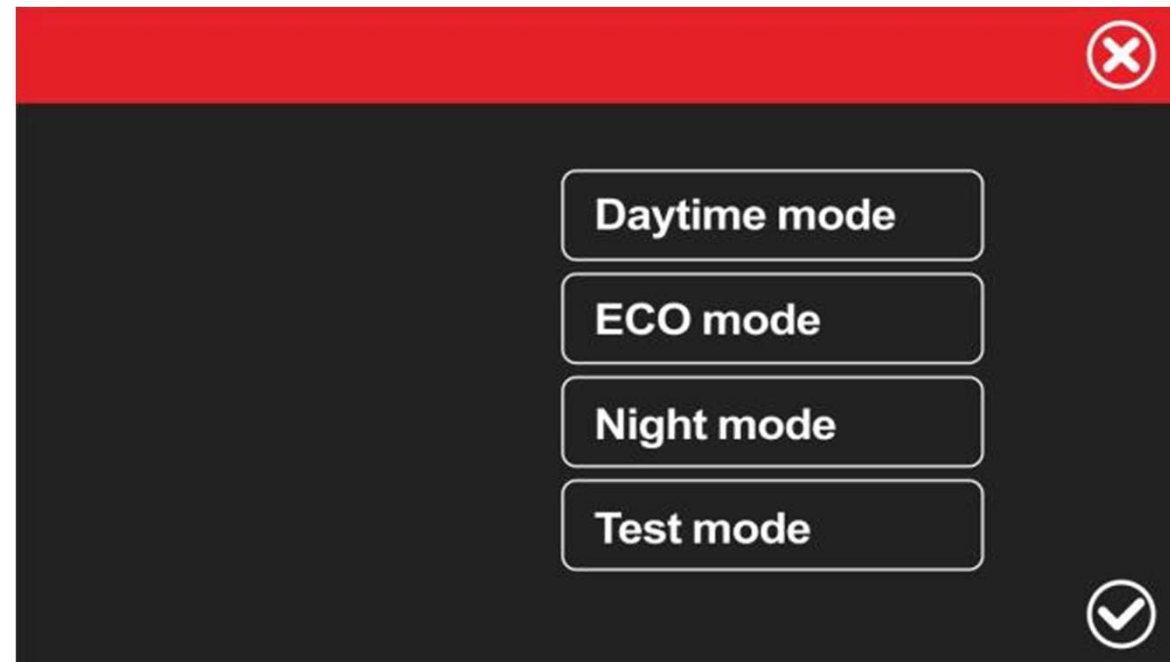
The **mobile phone APP** and **the PC background** both can be opened to users.

It can be used for remote control, after-sales inspection, data optimization, etc.

One Click Remote Software Upgrade——If there's a necessary software update, the system will keep you informed so that you can upgrade the controller software with one click anytime, anywhere as long as it connects to the internet.



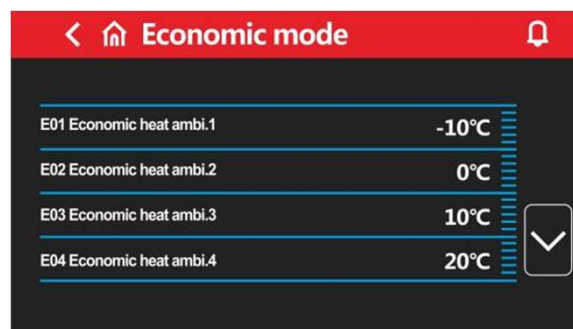
Function Example 1 - Fan mode



- **Daytime mode**-According to the ambient temperature and loading requirements, the compressor runs at the maximum frequency, and the fan runs at the maximum speed;
- **ECO mode**-automatically output capacity as required according to the ambient temperature.
- **Night mode**-has low output capacity from 8Pm to 8Am.


Function Example 2 - Economic mode

Click the Economic mode can enter the setting of relevant parameter on ECO mode



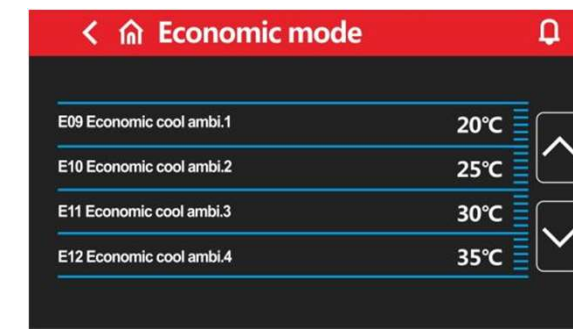
< Economic mode

E01 Economic heat ambi.1	-10°C	
E02 Economic heat ambi.2	0°C	
E03 Economic heat ambi.3	10°C	▼
E04 Economic heat ambi.4	20°C	▼



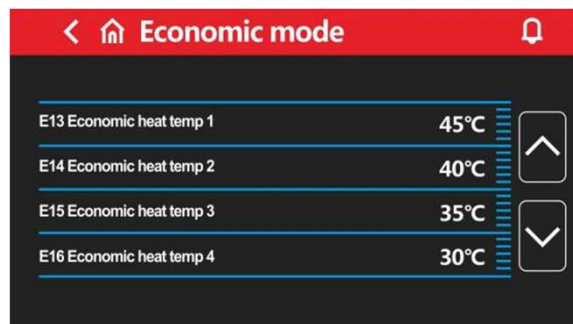
< Economic mode

E05 Economic water ambi.1	0°C	▲
E06 Economic water ambi.2	10°C	▲
E07 Economic water ambi.3	20°C	▼
E08 Economic water ambi.4	30°C	▼



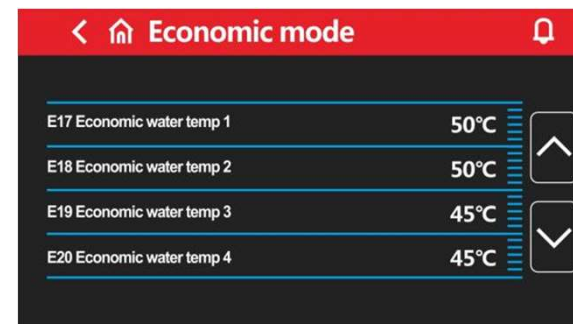
< Economic mode

E09 Economic cool ambi.1	20°C	▲
E10 Economic cool ambi.2	25°C	▲
E11 Economic cool ambi.3	30°C	▼
E12 Economic cool ambi.4	35°C	▼



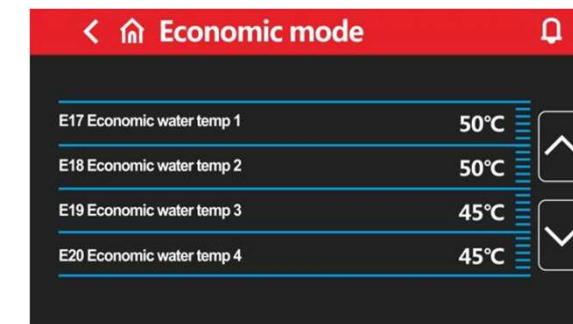
< Economic mode

E13 Economic heat temp 1	45°C	▲
E14 Economic heat temp 2	40°C	▲
E15 Economic heat temp 3	35°C	▼
E16 Economic heat temp 4	30°C	▼



< Economic mode

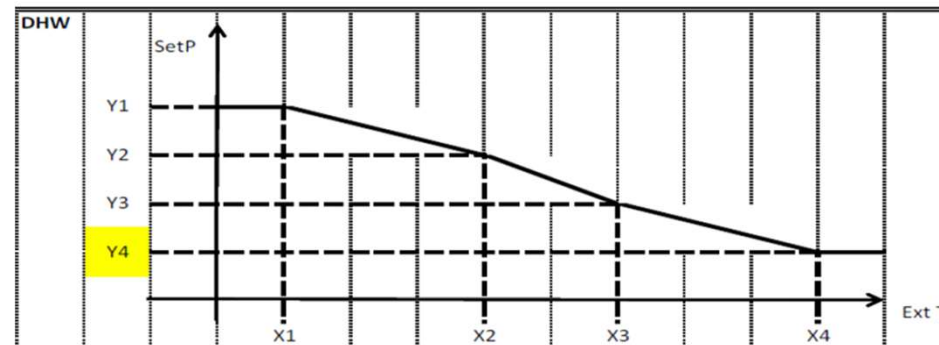
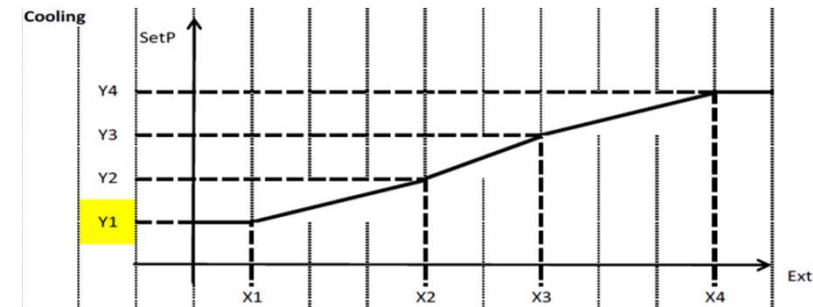
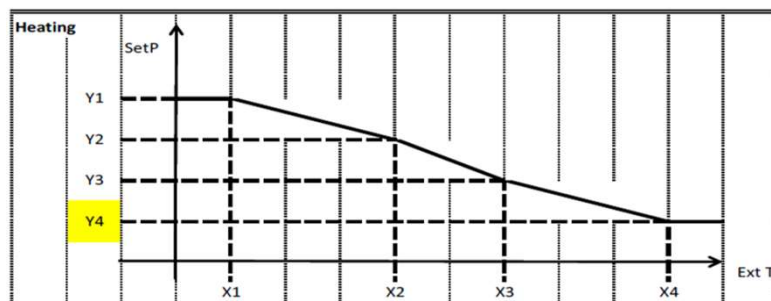
E17 Economic water temp 1	50°C	▲
E18 Economic water temp 2	50°C	▲
E19 Economic water temp 3	45°C	▼
E20 Economic water temp 4	45°C	▼



< Economic mode

E17 Economic water temp 1	50°C	▲
E18 Economic water temp 2	50°C	▲
E19 Economic water temp 3	45°C	▼
E20 Economic water temp 4	45°C	▼

Function Example 2 - Economic mode



Function Example 3 - Defrosting

Three different period for defrosting.

First period:

H04: Ambient temperature for defrosting - 15°C

H07: Defrosting environment and evaporator coil temperature difference 1 - 7°C

H08: Defrosting period 1 - 45min

Second period:

H09: Ambient temperature for defrosting - minus 2°C

H10: Defrosting environment and evaporator coil temperature difference 2 - 6°C

H11: Defrosting period 2 - 60min

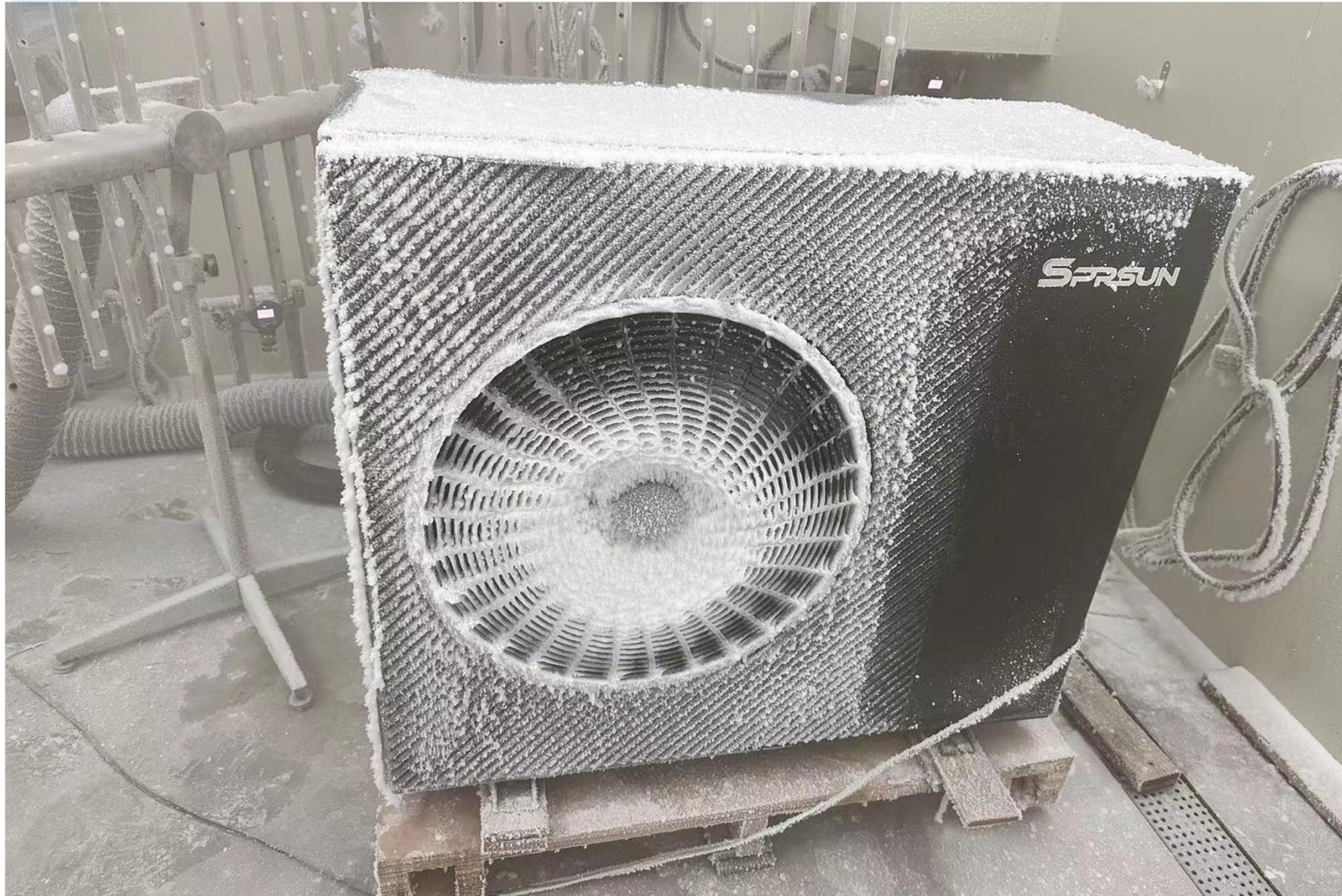
Third period:

H12: Ambient temperature for defrosting - minus 10°C

H13: Defrosting environment and evaporator coil temperature difference 3 - 5°C

H14: Defrosting period 3 - 90min

Function Example 3 - Defrosting



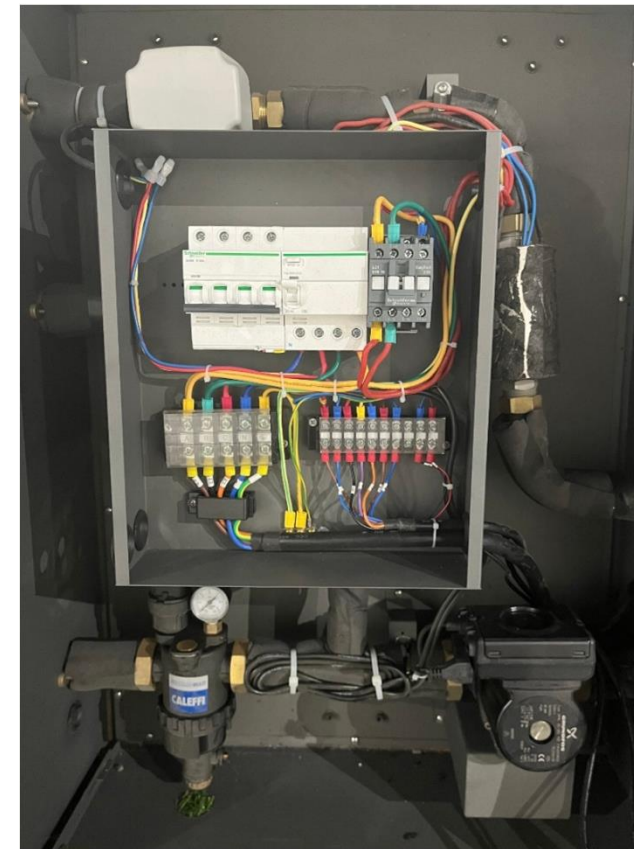
. How does SPRSUN compare with other brands?

	SPRSUN R290	P** R290	B** R290
Heating capacity	9kw~18kw	8.3kw~22kw	8.9kw~22kw
Max. COP	5.56	5.29	5.09
ERP Level	A+++	A+++	A++
SG ready	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CAREL control system	<input checked="" type="checkbox"/>	Unknown control system	Self-built control system
Electricity Statistics Function	<input checked="" type="checkbox"/> Real-time/historical power consumption can be viewed	<input type="checkbox"/> None	<input type="checkbox"/> None
Panasonic R290 compressor	<input checked="" type="checkbox"/> High safety grade	<input type="checkbox"/> Non-famous brands	<input type="checkbox"/> Non-famous brands
Built-in water pump	<input checked="" type="checkbox"/> Grundofx high quality water pumps	<input type="checkbox"/> Additional pumps to be purchased	<input type="checkbox"/> Additional pumps to be purchased

Easy Installation

The heat pump kit consists of **all major components for installation, including a water pump, electric box, AC contactor, three-way valve, expansion tank, filter, leakage protection switch, etc.**

Currently, the kit supports Heat Pumps saving customers a lot of time and money on heat pump installation.



One-stop heating solutions

Supplementary product: Heat Pump + Heat Pump Kit + Water Tank + Radiator/Fan Coil



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