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 [www.shenlingglobal.com](http://www.shenlingglobal.com) (Shenling ETS)  
[www.shenling.com](http://www.shenling.com) (Shenling Corporation)



## AIR SOURCE HEAT PUMP

space heating | cooling | water heating



Keep warming your world



## Contents



**Why is Shenling**



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can Shenling  
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**What  
is Shenling  
looking forward to**



## About Shenling

**Guangdong Shenling Eco-Thermal System Co., Ltd. (Shenling ETS)**, a subsidiary of Shenling Corporation, is located in Shunde, the centre of the Pearl River Delta in China. Shenling ETS is committed to providing customers with eco-thermal systems for space heating, energy storage, and energy management through renewable energy. For space heating, Shenling ETS provides a full range of air to water heat pumps with cutting-edge technologies and excellent craftsmanship.

Shenling ETS has experienced R&D, testing and evaluation, and QC expertises equipped with professional labs and facilities to promise high-efficiency and reliable products. Shenling's digital Lighthouse Factory with fully automatic production lines and specialized procurement and PMC teams can promise an effective output and stable leadtime. Meanwhile, service technicians are always there for technical and service supports.

### ▼ Production base III



**Shenling Corporation, stock code 301018.SZ**, founded in 2000, is a modern enterprise that concentrates on air conditioning and refrigeration, solutions for environmental treatment, and energy consumption management. It integrates R&D, design, manufacturing, marketing services, engineering installation, operation and maintenance together. Shenling has professional HVAC expertise in various fields, including data service industry, industrial production and research, professional specialized application and high-end public building indoor environment. Shenling provides integrated and vertical HVAC solutions for clients all over the world.

### ▼ Headquarter



### ▼ Production base II





## Milestones

**2000**

Shenling Corporation founded

**2002**

Won the international bid of the Three Gorges Hydropower Project

**2003**

Shenling Postdoctoral Programme established

**2006**

The first supplier of the United Nations procurement in Guangdong

**2007**Joint-lab with Siemens  
Bid winner of Beijing Capital International Airport PCA heat pump**2008**

2010 FIFA World Cup S.A FNB Stadium AC supplier

**2012**New H.Q launched  
National Enterprise Technology Center**2014**Production Base II launched  
High-temp multi-stage heating type heat pump developed&used in White Swan Hotel**2017**China Patent Excellent Enterprise Award  
Bid winner of Beijing Daxing International Airport PCA heat pump**2018**

National Technology Innovation Model Enterprise Award

**2019**

National Intellectual Property Advantage Enterprise Award

**2021**I.P.O.  
4-pipe screw air/water heat pump developed& used in Binzhou Hospital**2022**Production Base III launched  
Shenling ETS established



## Why is Shenling

Experiences accumulated over the passed 20+ years have enabled Shenling a professional HVAC supplier. Now Shenling provides end-to-end integrated HVAC solutions for global customers, integrating HVAC consultation, system design, equipment R&D, integrated implementation, commissioning and acceptance, intelligent control, as well as IOT operation and maintenance.

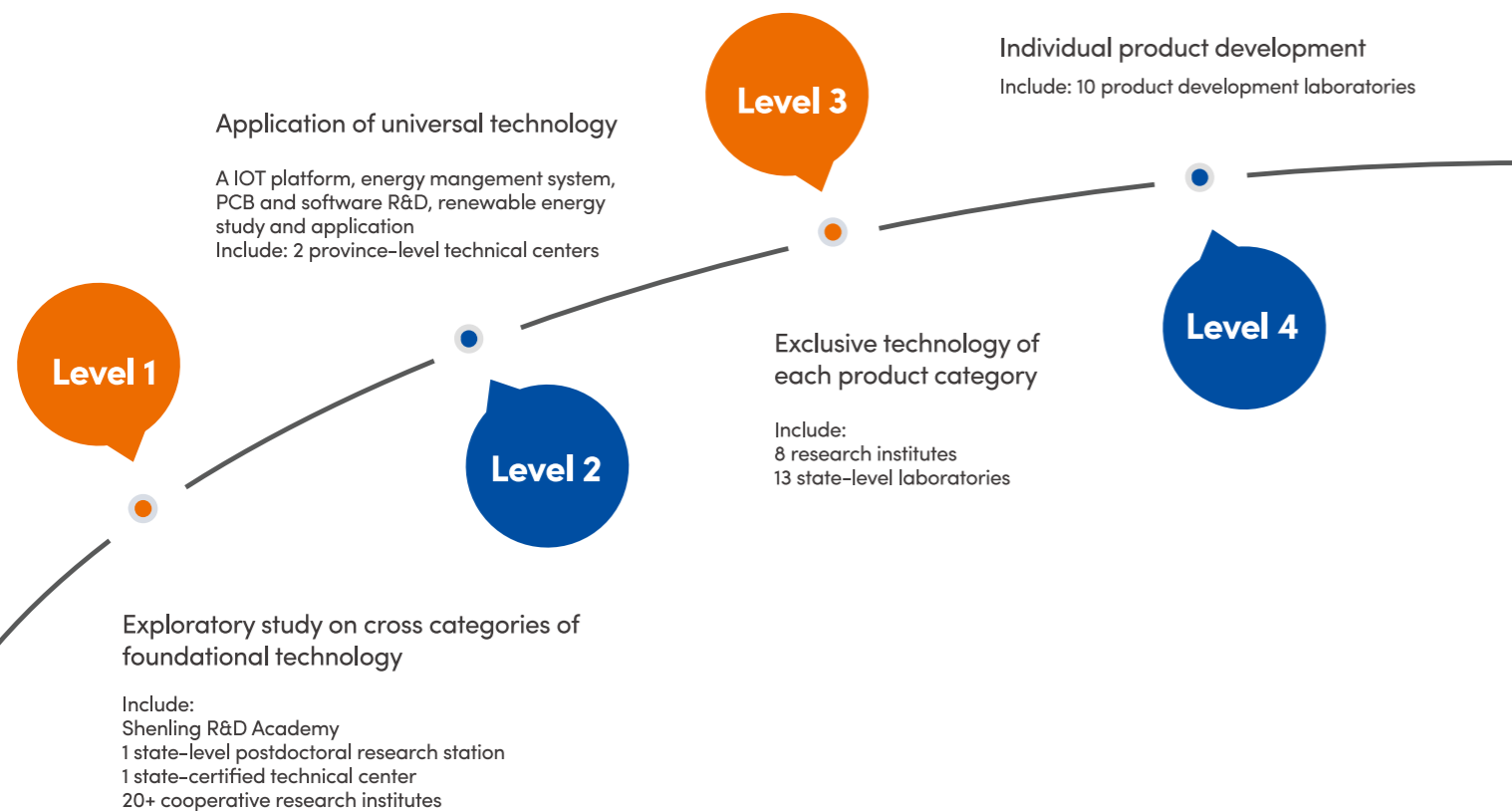
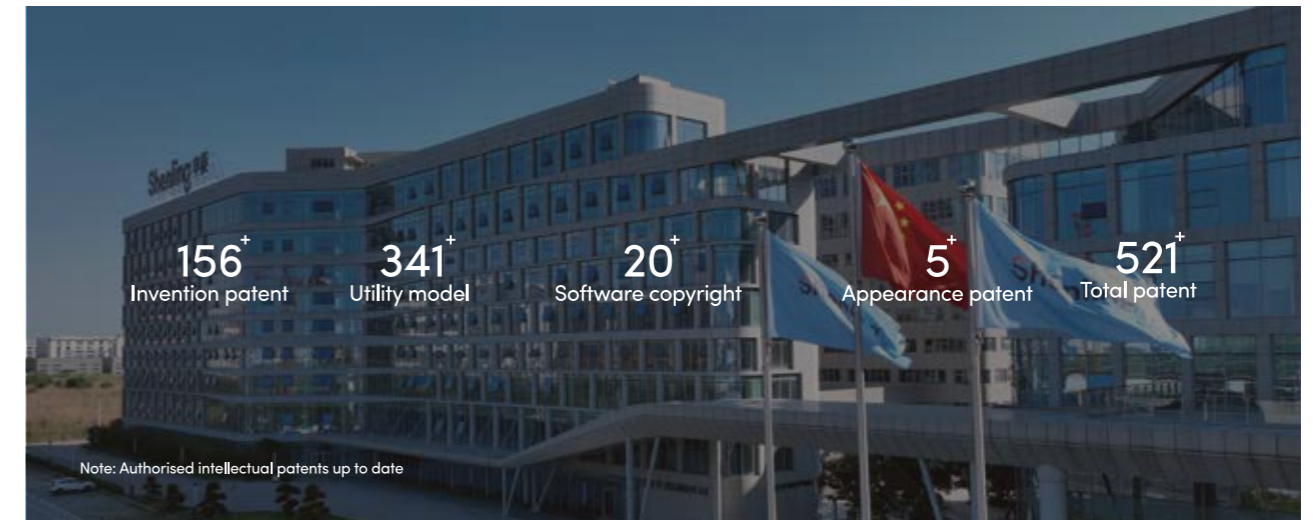
# Technological research

## Innovation mode of Shenling

Shenling relies on the state-level technical center to develop high-grade, precision, advanced and specialized HVAC products, through which, Shenling has successfully attracted and trained thousands of talents, realizing independent innovation, and established long-term technical exchange and cooperation with professional design institutes, research institutions and universities globally. With industry oriented application, Shenling persists in the R&D direction of efficient use of energy, low carbon, environmental protection, new energy and circular economy, and integrates techniques of different fields and disciplines to construct a competitive technical system and to realize continuous innovation.



## Science & technology achievements



# Production system



Shenling has leading technical advantages, excellent management team, first-class production facilities, and comprehensive management system, which built up a solid foundation for Shenling's reputation in HVAC field. Currently, Shenling has built up research and manufacturing bases with modern equipment of over 150000 square meters. The production capacity of the manufacturing base exceeds 1 billion USD, which can satisfy the needs of consumers within the lead time.

- Manufacturing base covering an area over 150,000m<sup>2</sup>
- Modernized production plants equipped with first-class processing and testing equipment
- ISO 9001 quality management system
- ISO 14001 environmental management system
- ISO 45001 Occupational health and safety management system
- IECQ QC 080000 hazardous substance process management system
- Enterprise of Work Safety Standardization
- Audited green factory of clean production
- Certificated Measurement Assurance System in compliance with ISO 10012.1

## Manufacturing system overview

- Through rigorous and unified quantitative performance assessment, Shenling ETS selects the best domestic and international suppliers to create an efficient and collaborative supply chain system.



- The use of automated production lines and advanced processing equipment, laying the foundation for efficient production, single production line on average 72 " to complete a product output.



Automatic production line



Helium inspection line



Manipulating robot



AGV

- Rapid production switching of multiple batches of products, rapid response to multiple customer demand orders, production switching of different batches of product models takes only 3 minutes.
- Electronic information management, automatic logistics distribution, information monitoring and dispatching command of the whole production process.





# Shenling Testing Center

Shenling Testing Center is an accredited laboratory by China National Accreditation Service for Conformity Assessment(C-NAS), and the assessed laboratory by National Compressor Refrigeration Equipment Quality Inspection and Testing Center (GMPI), The Air-conditioning, Heating, and Refrigeration Institute(AHRI), etc, with a leading management system and testing devices in the HVAC industry.



1200kW air cooled enthalpy difference lab

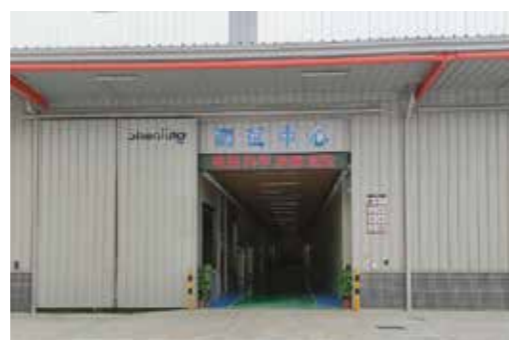


1500kW air cooled enthalpy difference lab

Shenling Testing Center covers about 8000m<sup>2</sup>, with over 20 sets of medium and large equipment, all built with the concept of digitalization by leading institutes and equipped with top brand instruments and meters. The testing scope covers performance, reliability, structure, safety, cleanliness and other aspects of air conditioning products. Shenling Testing Center has industry-leading air conditioning performance test capabilities, including 120000m<sup>3</sup>/h air volume, 750kW enthalpy difference, 1500kW air-cooled/direct evaporative cooling unit, 1500RT water-cooled unit, -40°C~60°C ambient temperature range, etc.



H.Q. testing base



PBIII testing base



1500RT water cooled heat pump platform



R290 A/W heat pump performance lab



R290 A/W heat pump performance lab



PBIII testing base



Digital central control room

Shenling Testing Center has been focusing on providing high quality testing services through the improvement of personnel capabilities and the expansion of testing capabilities, and the quality policy of "objective, scientific, accurate, and efficient" has deeply rooted in its spirit.



# Quality control

Shenling has established a sound quality management system, always focusing on "customers", by identifying and controlling the whole process of quality planning, quality assurance, quality control and quality improvement. Shenling integrates professional tools in product manufacturing process, advanced methods and means of quality management, and combines quality data statistical analysis and quality awareness education into **DO IT RIGHT AT THE FIRST TIME**, to create every high-quality

## Incoming components problem screening

### Parts laboratory

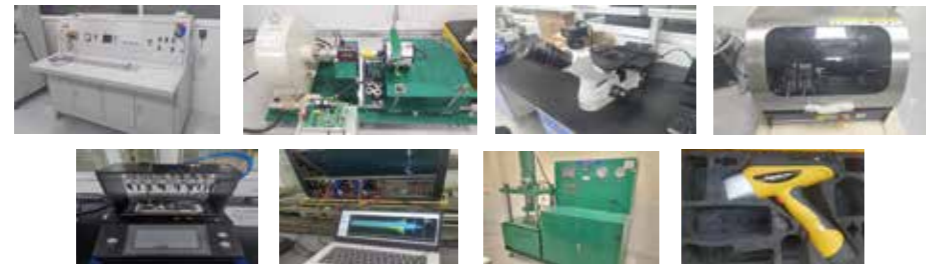
As the quality verification platform for technical evaluation and quality improvement of parts and components, parts laboratory provides incoming material inspection, systematic analysis of applied bad data, environmental adaptability/reliability verification and material failure analysis.



### Primary tasks

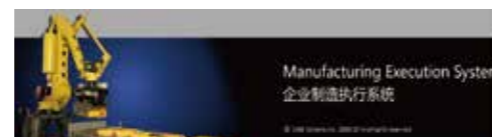
- Quality inspection and supervision of incoming parts**  
 Identify potential risks of key materials, and establish corresponding equipment, detection capability, inspection and interception mechanism at the incoming side to improve customer satisfaction.
- Environmental adaptability and reliability verification of parts**  
 Carry out environmental adaptability and reliability verification for new materials, identify/improve potential defects of materials, and reduce the maintenance rate of complete products.
- Analysis, verification & improvement of material defects/failures**  
 Analyze the root cause of material failure in the manufacturing process and market, and promote a series of activities of technology zeroing and management zeroing.
- Statistical analysis, monitoring, warning and improvement of bad material application**  
 Big data analysis, monitoring, early warning and improvement based on bad data of various materials in MES/OA background.

- The main instruments include: EDX spectrum detector, ROHS 2.0 detector, hardness tester, vacuum helium detector, metallographic microscope analyzer, high and low temperature damp heat test chamber, valve comprehensive performance test bench, parts blasting test bench, salt spray test chamber, cleanliness test equipment, thermostatic water tank, chemical test instrument, safety tester, needle flame test bench, burning test bench, etc.
- Reliability test items are formulated according to product failure risk, covering all key components such as refrigeration devices, electrical components and structural components.
- The test frequency shall be strictly implemented according to the annual test plan.

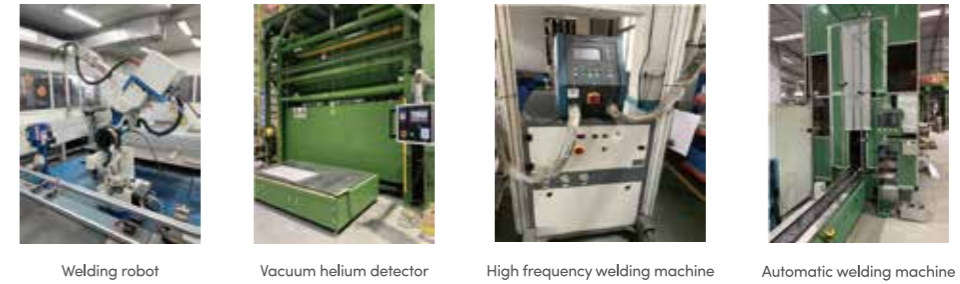


## Manufacturing process quality control

Through the establishment of product QCP, combined with the manufacturing execution system(MES), the key control points in the manufacturing process are controlled, the quality data is displayed explicitly, the quality of the manufacturing process is stable and reliable, and the quality data tracing in the whole process of production is realized.



## Process equipment



Welding robot    Vacuum helium detector    High frequency welding machine    Automatic welding machine



Vacuum drying system    Vacuum helium detector

## New product quality control

### IPD process



- A sound new product integrated development process (IPD process) and team have been established to manage and control the relevant process points, and the responsibilities and approval authority of each development process have been
- APQP tools are adopted to control the key control points in the development process, such as customer demand/application scenario identification QFD, risk identification D/PFMAE, control plan CP, scheme review, verification closed-loop, etc.
- Diversified product analysis has been carried out, including manufacturability, reliability, maintainability, safety, testability and environmental adaptability, etc.

## Quality improvement

Shenling has established quality management platform for continuous improvement. By focusing on VOC and VOB according to product demands and PDCA principles, and carrying regular specific activities such as QCC and quality projects, Shenling promotes continuous product quality improvement.





## Technical and service support

### Objective

Shenling provides diversified training courses to our partners for better understanding and technical mastery of the products, such as the selling points introduction for sales personnels, design and application training for technical teams, maintenance and service training for service personnels, and etc.

### Training Centers

The training centers provide hands-on experiences with various systems, components and controls to refresh and enhance the skills of your sales, design and installation and service teams.

#### Shenling ETS Training Center

Address: No. 29, East Shunde Rd, Xingtan High-tech Park, Shunde, Guangdong, P.R.China

Products: air source heat pump, PVT, energy storage, specialized AC

#### Shenling HQ Training Center

Address: Xinglong 10 Rd, Chencun Machinery Equipment Park, Shunde, Guangdong, P.R. China

Products: centrifugal chiller, screw/scroll chiller and terminals, system design and engineering, IOT&smart control



### Design & Application Trainings

The design and application trainings for various products are basically for the sales personnel selling products in order to give them basic understanding about the main features.

### After Sales-Service Trainings

These trainings are dedicated for the after-sales/service personnel in order for them to better carry out the installation, commission and maintenance of the products. In Shenling training rooms, the trainees have chances to solve malfunctions on real products, delicately prepared for each training.

### Online Trainings

Online training is an alternative way of quick response and easy access for global customers.

With the help of our technical team, the customers do not need to be physically present for the training.

Amid the COVID-19 pandemic, we have conducted a lot of online trainings.





# Reference project



◀ Guangzhou Baiyun Airport  
Location: Guangzhou, China  
Product: PCA heat pump, rooftop, precision AC



◀ Canton Fair Exhibition Center  
Location: Guangzhou, China  
Product: chillers, AHU



▶ Beijing Capital International Airport  
Location: Beijing, China  
Product: PCA heat pump, evaporative chillers



◀ IKEA  
Location: Various of places in China  
Product: Rooftop, engineering



◀ Three Gorges Hydropower Project  
Location: Yangtze River, China  
Product: Air-cooled&water-cooled screw chillers, AHU

▶ FedEx Asia Pacific Hub  
Location: Guangzhou, China  
Product: Evaporative chillers



▶ Soccer City, 2010 FIFA World Cup  
Location: Johannesburg, South Africa  
Product: water source heat pump, AHU



▶ The White Swan Hotel  
 Location: Guangzhou, China  
 Product: High-temp multi-stage heating type heat pump, FCU



▶ Zhujiang Hospital  
 Location: Guangdong, China  
 Product: Thermostatic & humidistatic clean AC



◀ Grand Epoch City  
 Location: Hebei, China  
 Product: Polestar A/W heat pump



▲ CSPP Central Institute of Pharmaceutical Research  
 Location: Hebei, China  
 Product: Combined AC unit, thermostatic & humidistatic AC, HRV



▲ Chongqing Grand Theatre  
 Location: Chongqing, China  
 Product: Thermostatic & humidistatic AC





## What can Shenling provide

To help solve the heating requirement due to Europe's energy shortage and promote renewable electrical heating, Shenling, as the professional HVAC supplier with sound and solid foundation, is now providing to markets high efficient and environment-friendly air-to-water/air source heat pump systems for space heating, cooling and water heating.





# ThermaX

## Full-DC Inverter Air Source Heat Pump

### Mono Series

### Split Series



	Capacity(kW)	4	6	8	10	12	14	16
Mono	220 ~ 240V/1N/50Hz	√	√	√	√	√	√	√
	380 ~ 415V/3N/50Hz					√	√	√

	Capacity(kW)	4	6	8	10	12	14	16
Split	220 ~ 240V/1N/50Hz	√	√	√	√	√	√	√
	380 ~ 415V/3N/50Hz					√	√	√



- **Aesthetic industrial design**

Easy to integrate with the architectures

- **Mould shaped shell and structure**

Higher processing precision;  
Higher reliability and consistency;  
Higher production efficiency and guaranteed delivery date

- **Single fan & compact design**

Smaller floor area  
Higher installation freedom  
Larger container loading quantity

### Overview

- Energy class: **A+++**
- R32 refrigerant
- Space heating+Cooling+DHW
- Min operation ambient temp. -25°C
- Max outlet water temp. 65°C
- Full colour LCD display controller
- Wifi smart control
- Smart grid
- Disinfection
- Power consumption counting



Space heating mode



DHW mode



Cooling mode



Space heating & DHW mode



Cooling & DHW Mode



Auto mode



Ultra-silence



Ultra Silence

ThermaX produces as low as 35dB(A) sound pressure level at 3 meters



32 dB (A)  
The noise of falling leaves



35 dB (A)  
Noise from sleep



46 dB (A)  
Noise in the library



Biomimetic fan design

• Concave design of suction surface

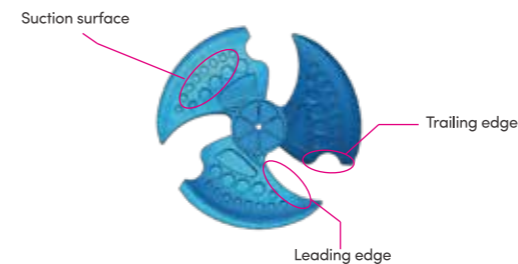
Minimize the wake vortex shedding from suction surface  
Optimize the flow field on the surface of blade  
Reduce the weight and improve the efficiency

• Thickening design of leading edge

Improve the strength of the blade  
Reduce the noise of low frequency

• Notch design of trailing edge

Optimise the pressure distribution of the blade trailing edge  
Reduce the noise of wake vortex shedding from the blade



ODU sound proof design

• Full set of plate and plastic mould

Precision manufacturing based on mould die stamping  
Better fit of sheet metal parts, lower vibration noise

• Simulation at different frequencies

Compreson vibration simulation  
CFD and flow simulation

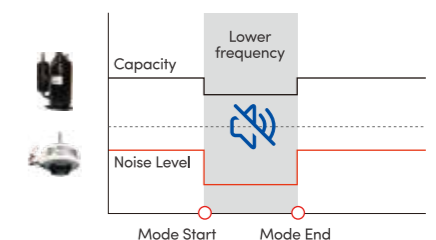
• 3 layers of sound insulation

Compressor sound insulation to reduce the compressor noise  
Sheet metal insulation to reduce the system noise  
Enviroment friendly sound-absorbing materials



Silent mode

When silent mode selected, ThermaX will lower down the frequency of compressor and fan motor. In this mode, the operating sound will be effectively decreased, while the capacity be decreased slightly.



# High-Energy efficiency



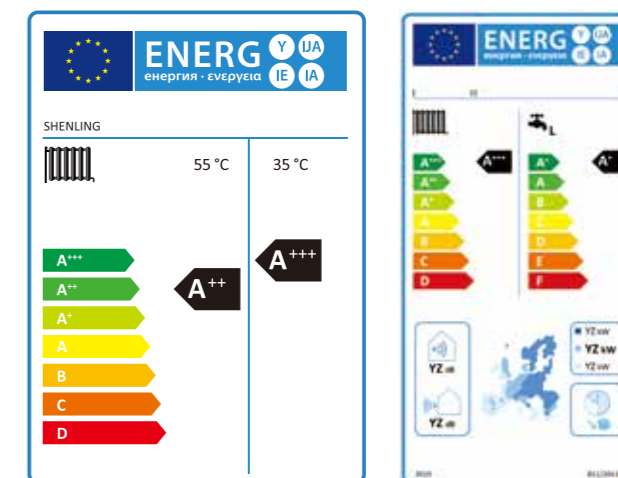
## ERP Directive

Seasonal space heating energy efficiency

$\eta_s$ . average up to **A+++** at 35°C

$\eta_s$ . average up to **A++** at 55°C

It represents the highest level of ThermaX product. Please refer to the product for specific grade of different models.



## High Efficiency Components

- DC inverter compressor

Wide working frequency  
High efficiency operation in different frequency

- Electronic expansion valve

High efficient&reliable famous brand  
High precision regulation of different loads and flows, max 500 steps

- DC Inverter fan motor

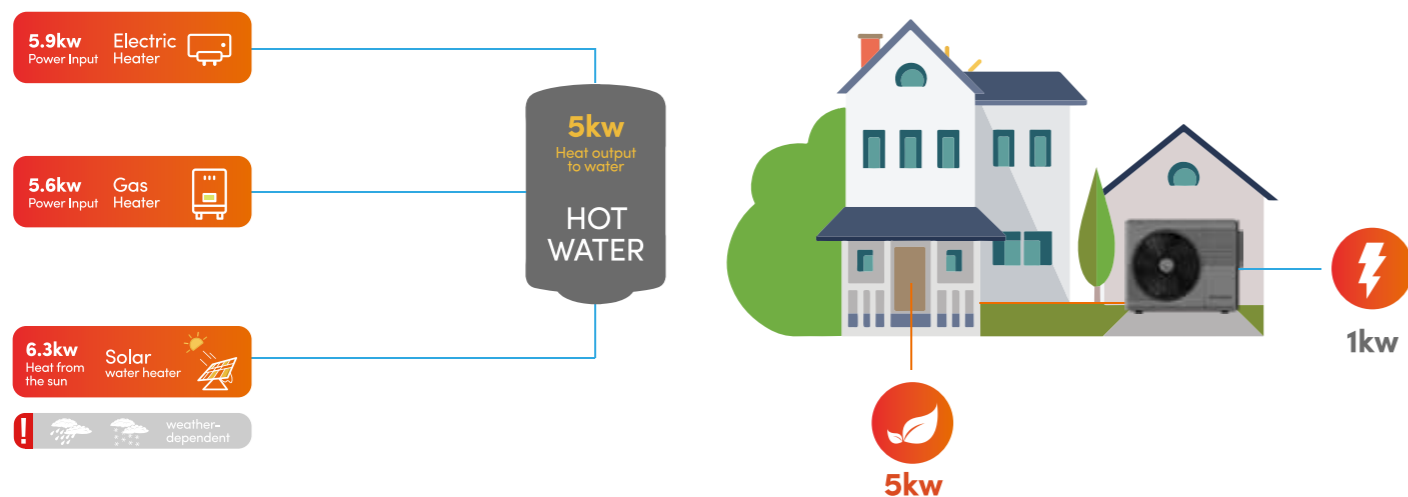
Stepless control  
Different speed in different loads  
Low power consumption

- DC inverter circulation pump

Famous brand  
High Efficiency pump for heating application  
High delivery head, small size, low noise

- Plate heat exchanger

Famous brand  
Better efficiency and smaller size than tube-in-tube type or high-efficiency tank

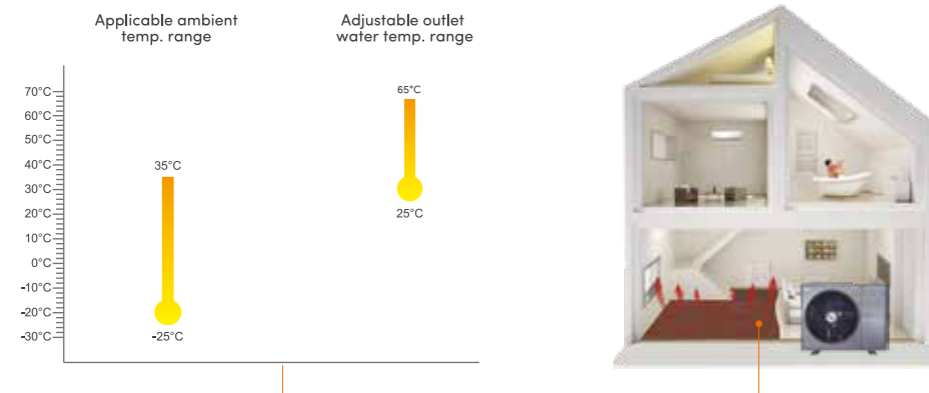


# Stable and reliable

## Wide operation range

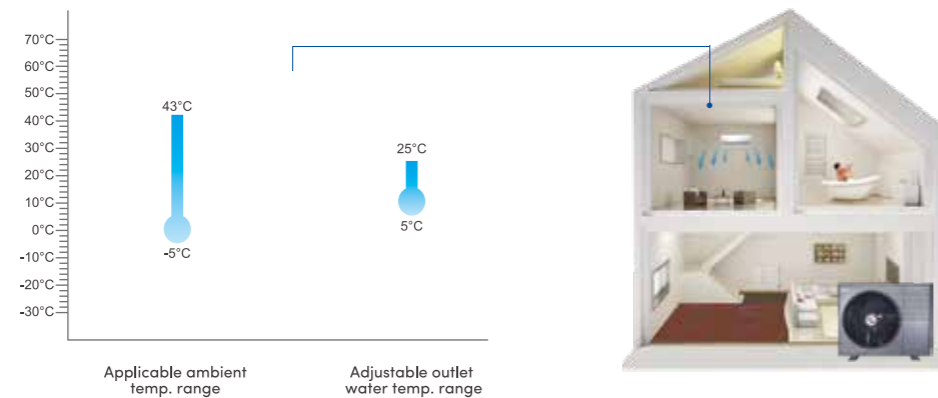
### a. Space heating

- Min ambient temperature for space heating is **-25°C**
- Outlet water can reach **60°C** at **-15°C** ambient temperature



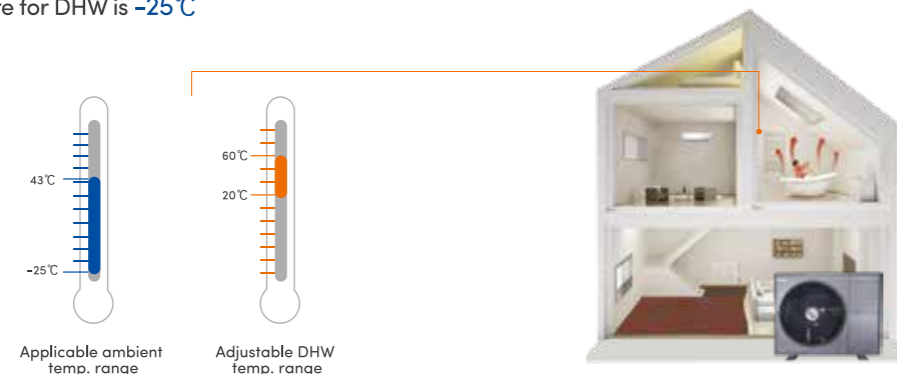
### b. Space cooling

- Start cooling at **-5°C** ambient temperature



### c. DHW

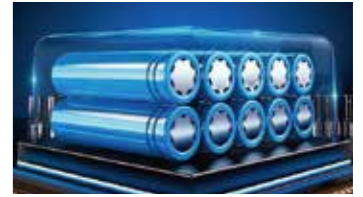
- Min ambient temperature for DHW is **-25°C**



## Power limitation

Power limitation design is to limit the max access current to let the equipment become suitable for a variety of current supplies.

The user need only choose from the set configurations on the wired controller, then the unit will be able to suit different application.



## Floor preheating

For initial heating, if the floor has a higher water content, it might be warped or even muptured during floor heating. The drying up mode is designed to be used before the initial heating of newly installed floor loops and the pre-heating mode designed for the first heating of a new seasonal heating to protect the floor. In these modes, the water temperature will gradually increased during the operation.



## Holiday mode

Holiday mode is a function to improve system reliability and energy saving. The user can select this mode and set the schedule before going on holiday away home. ThermaX will work with low water temperature in space heating and/or DHW mode in order to avoid water from freezing in winter. Before the user's back, ThermaX will start disinfection automatically to ensure germ free water available. The user can also turn it off manually.



## Alternative operation

ThermaX supports modular installation for an extension of capacity. To promise the running time of different modules are balanced, ThermaX will check the running time of each module during startup and will start the modules from the minimum running time to the maximum according to the capacity demand.

## Multiple system protection

- Multiple antifreeze protection
- Multiple oil return control
- High voltage protection
- Low voltage protection
- High temperature protection
- Efficient intelligent defrosting

## Quality parts



### DC inverter compressor

- CE certification
- Widely working frequency
- Twin eccentric cams  
2 balance weights  
Better balance  
Low vibration



### Mould stamping structure

- High processing precision
- Highly robust bearings
- Highly stable moving parts



### Heat exchanger aluminum foil

- Standard products:  
200h of neutral salt mist
- Heavy anti-corrosion products:  
1000h of neutral salt mist  
140h of acid salt mist



### Heat exchanger copper pipe

- Standard products:  
240h of neutral salt mist
- Heavy anti-corrosion products:  
150h of neutral salt mist for ODU

# Intelligent control

## Wired controller

- **Function**  
Standard wifi function for remote control  
SD card program upgrade, easy for maintenance  
User-friendly interface, easy to operate
- **Appearance**  
Aesthetic design, simple but not easy  
Obsidian black colour, high-end and elegant  
14mm ultra-thin design, small and exquisite
- **Installation**  
With installation backplane, installed independently, or compatible with 86 threading box



## APP control

- Easy to read and set
- Dual temperature zone control
- Schedule function and weekly/daily timer
- Silent mode
- Holiday mode
- Remote monitoring technology
- 5 language control



## Convenient program upgrade

- **Mini USB upgrade**  
No need to carry any other heavy equipments but only a laptop and a Mini USB cable can realize program upgrade of indoor unit and outdoor unit automatically.  
Parameter setting transmission between wired controllers.



## Dual temperature zone control

ThermaX offers a choice to control dual temperature zones simultaneously by supplying different water temperature for fan coil and floor heating of realizing the best comfort. The user needs simply make a choice by a touch on the wired controller, ThermaX will run the mode automatically. The user can also set his favourite temperature for each zone accordingly. This function includes floor heating only, fan coil only, floor heating + fan coil, etc.



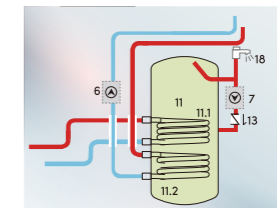
## Smart Weather adaptation

With the help of weather temperature curve, water temperature will automatically change as outside air temperature changes. When outdoor air temperature increase/decrease, the heating load will decrease/increase.



## Quick hot water outlet

Install the DHW pipe pump (Code 7) to the water system, under the control logic of ThermaX, the water will be heated and circulated in pipeline, so that the users don't have to wait for the cold water released and wasted, but can use hot water directly.



## Smart grid

ThermaX heat pump can recognise different electrical signals from the grid and adjust accordingly. By recognising the peak and valley of urban electricity supply, ThermaX will give priority to produce domestic hot water during low price period, and set maximum operation limit in the high price period.



## Weekly/Daily timer

The user can set different temperature for different time periods in a day or different time periods every day within a week through the wired controller. The unit can operate according to the mode and temperature set after being started.

Daily	8: 00-12: 00	12: 00-16: 00	16: 00-20: 00	20: 00-24: 00	24: 00-8: 00		
	✓		✓	✓			
Weekly	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
		✓	✓		✓		✓

## Power consumption counting

ThermaX has preserved a statistical counting function of the power consumption of the unit itself. The user needs only connect an electricity meter to read and collect the statistics.  
This function may have difference with the other measurement and only for reference.



# Easy installation

## Key components built-in

ThermaX has built-in most of the key components of the refrigerant circuit and water pipeline, by which the installers can take an easy way during the installation.



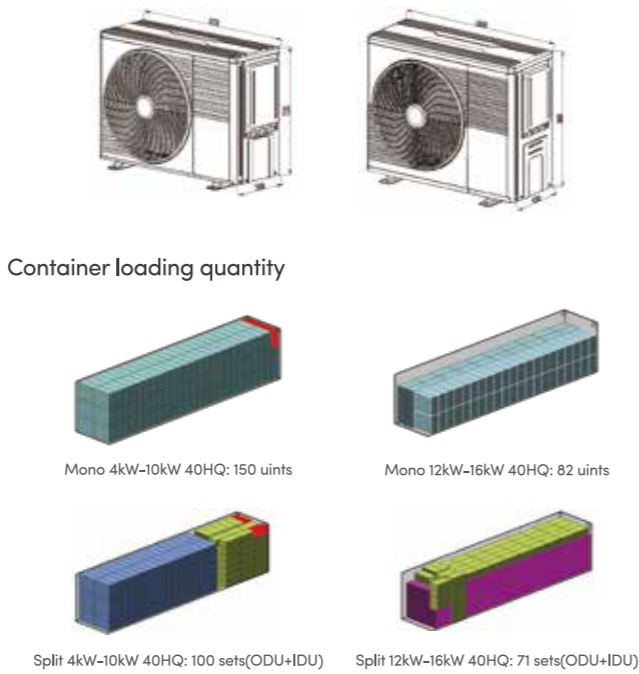
## Flexible installation

- Flexible installation, installed whether independently without 86 threading box, or compatible with 86 box.
- Integrated structure design, with its own installation backplane, easy for disassembly, convenient for installation.



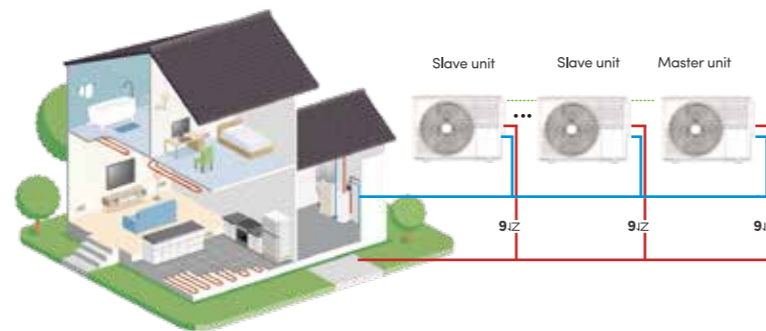
## Compact design

Single fan design enables ThermaX easier transportation and more flexible installation.



## Electrodeless communication for modular installation

The design of modular combination is for capacity extension in certain case when large cooling/heating capacity is required. In modular combination, one controller can control up to 6 units in group. Between modules, electrodeless communication is accepted and ThermaX will detect the signal and shift the internal recognition automatically. This design can greatly simplify the installation.



# Typical application

## One-stop solution - Heating, cooling and DHW in one system

ThermaX provides one-stop solution for space heating, cooling and sanitary hot water for households. It can be combined with floor loops, FCU, radiators, and domestic water tank.



ThermaX offers a comprehensive, all year round solution and can be connected to solar panels, gas boiler and other heat sources to build up a hybrid system. Even more conveniently, it can also be connected to your smart home system.



## Air exhaust function of water system

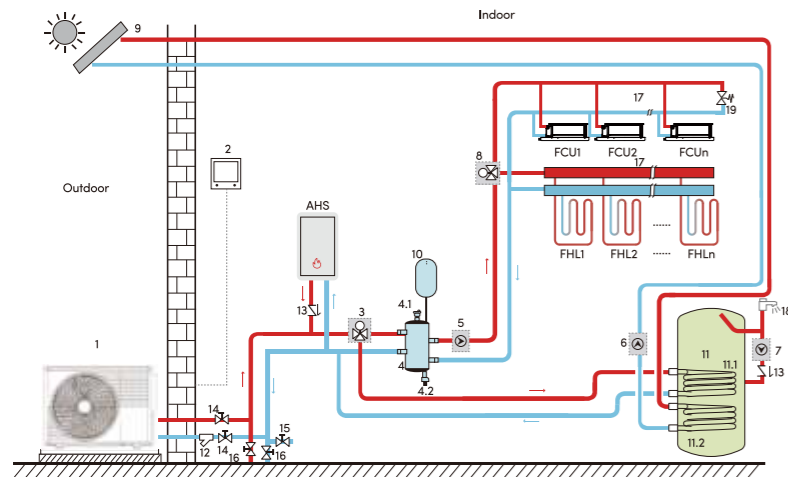
When the installation of the whole heating system finished, the installer may exhaust the air remained in the water pipeline through the function of air exhaust in the wired controller. In this function, ThermaX will keep low power consumption and not start the compressor.



# Typical application

## Single temperature zone

Domestic hot water+Auxiliary heat source

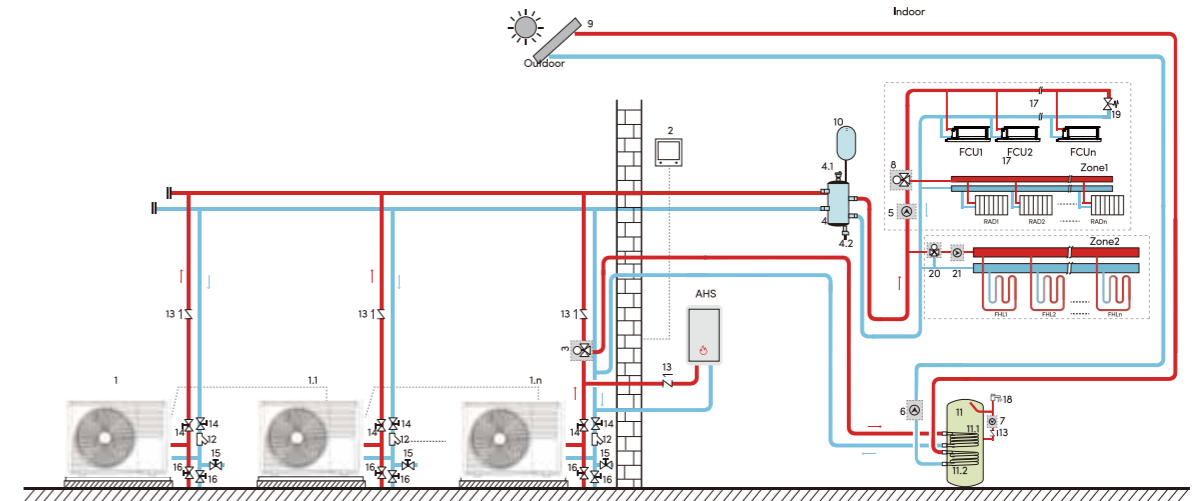


Code	Assembly unit	Code	Assembly unit
1	Main unit	11.1	Coil 1: heat exchanger for heat pump
2	User interface	11.2	Coil 2: heat exchanger for Solar energy
3	SV1:3 way valve (Field supply)	12	Filter (Accessory)
4	Balance tank(Field supply)	13	Check valve (Field supply)
4.1	Automatic air purge valve	14	Shut-off valve (Field supply)
4.2	Drainage valve	15	Filling valve (Field supply)
5	P_C1:Outside circulation pump(Field supply)	16	Drainage valve (Field supply)
6	P_C3: Solar pump(Field supply)	17	Collector/distributor (Field supply)
7	P_C4:DHW pipe pump(Field supply)	18	Hot water tap (Field supply)
8	SV3:3 way valve (Field supply)	19	Bypass valve (Field supply)
9	Solar panel (Field supply)	AHS	Auxiliary heat source (Field supply)
10	Expansion vessel (Field supply)	FHL	Floor heating loop (Field supply)
11	Domestic hot water tank (Field supply)	FCU	Fan coil unit (Field supply)

Note: Auxiliary heat source and domestic hot water shall be installed according to the actual use requirements.

## Cascade system

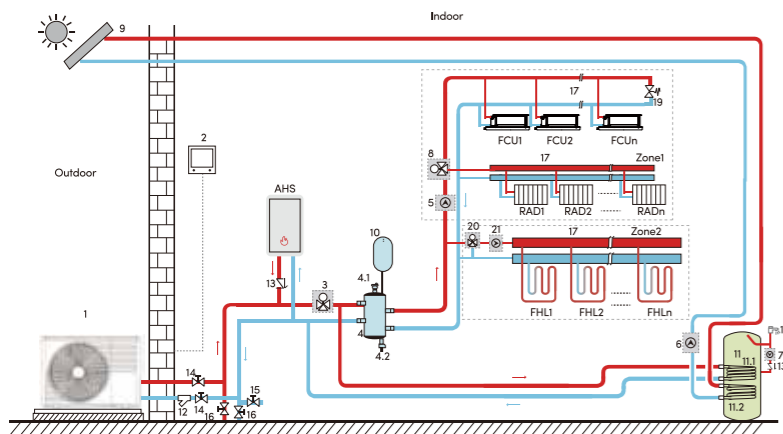
Dual temperature zone+Domestic hot water+Auxiliary heat source



Note: Auxiliary heat source and domestic hot water shall be installed according to the actual use requirements.

## Double temperature zone

Domestic hot water+Auxiliary heat source



Code	Assembly unit	Code	Assembly unit
1	Main unit	12	Filter (Accessory)
2	User interface	13	Check valve (Field supply)
3	SV1:3 way valve (Field supply)	14	Shut-off valve (Field supply)
4	Balance tank(Field supply)	15	Filling valve (Field supply)
4.1	Automatic air purge valve	16	Drainage valve (Field supply)
4.2	Drainage valve	17	Collector/distributor (Field supply)
5	P_C1:Outside circulation pump(Field supply)	18	Hot water tap (Field supply)
6	P_C3: Solar pump(Field supply)	19	Bypass valve (Field supply)
7	P_C4:DHW pipe pump(Field supply)	20	SV3:3 way valve (Field supply)
8	SV3:3 way valve (Field supply)	21	P_C2:Zone2 circulation pump(Field supply)
9	Solar panel (Field supply)	AHS	Auxiliary heat source (Field supply)
10	Expansion vessel (Field supply)	FHL	Floor heating loop (Field supply)
11	Domestic hot water tank (Field supply)	FCU	Fan coil unit (Field supply)
11.1	Coil 1: heat exchanger for heat pump	RAD	Radiator (Field supply)
11.2	Coil 2: heat exchanger for Solar energy		

Note: Auxiliary heat source and domestic hot water shall be installed according to the actual use requirements.

Code	Assembly unit	Code	Assembly unit
1/1.1/1.n	Main unit	12	Filter (Accessory)
2	User interface	13	Check valve (Field supply)
3	SV1:3 way valve (Field supply)	14	Shut-off valve (Field supply)
4	Balance tank(Field supply)	15	Filling valve (Field supply)
4.1	Automatic air purge valve	16	Drainage valve (Field supply)
4.2	Drainage valve	17	Collector/distributor (Field supply)
5	P_C1:Outside circulation pump(Field supply)	18	Hot water tap (Field supply)
6	P_C3: Solar pump(Field supply)	19	Bypass valve (Field supply)
7	P_C4:DHW pipe pump(Field supply)	20	SV3:3 way valve (Field supply)
8	SV3:3 way valve (Field supply)	21	P_C2:Zone2 circulation pump(Field supply)
9	Solar panel (Field supply)	AHS	Auxiliary heat source (Field supply)
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11	Domestic hot water tank (Field supply)	FCU	Fan coil unit (Field supply)
11.1	Coil 1: heat exchanger for heat pump	RAD	Radiator (Field supply)
11.2	Coil 2: heat exchanger for Solar energy		

# Specification

## Mono Series

Model	HPM-	V40W/R2	V60W/R2	V80W/R2	V100W/R2	V120W/R2	V140W/R2	V160W/R2	V120W/SR2	V140W/SR2	V160W/SR2	
Power Supply	V/Ph/Hz	220 240/1/50						380 415/3/50				
Heating <sup>1</sup>	Capacity	4.25	6.58	8.35	10.07	12.40	14.20	16.16	12.40	14.20	16.16	
	Rated Input	0.82	1.31	1.64	2.18	2.51	3.01	3.59	2.51	3.01	3.59	
	COP	/	5.20	5.02	5.10	4.61	4.94	4.72	4.51	4.94	4.72	
Heating <sup>2</sup>	Capacity	4.40	6.84	8.25	10.28	12.69	14.70	16.53	12.69	14.70	16.53	
	Rated Input	1.11	1.80	2.13	2.88	3.36	4.08	4.68	3.36	4.08	4.68	
	COP	/	3.95	3.81	3.87	3.57	3.78	3.60	3.53	3.78	3.53	
Heating <sup>3</sup>	Capacity	4.40	6.44	7.60	9.63	12.10	14.20	16.42	12.10	14.20	16.42	
	Rated Input	1.40	2.06	2.49	3.25	3.97	4.73	5.75	3.97	4.73	5.75	
	COP	/	3.15	3.12	3.05	2.96	3.00	2.85	3.05	3.00	2.85	
Cooling <sup>1</sup>	Capacity	4.50	6.55	8.40	10.01	12.30	14.20	16.23	12.30	14.20	16.23	
	Rated Input	0.78	1.26	1.68	2.30	2.62	3.16	3.68	2.62	3.16	3.68	
	EER	/	5.80	5.21	5.00	4.70	4.50	4.42	4.70	4.50	4.42	
Cooling <sup>2</sup>	Capacity	4.72	5.79	7.40	8.84	11.70	13.60	14.27	11.70	13.60	14.27	
	Rated Input	1.35	1.75	2.18	3.00	3.71	4.53	4.83	3.71	4.53	4.83	
	EER	/	3.50	3.31	3.40	2.95	3.15	3.00	2.96	3.15	2.96	
Seasonal space heating energy efficiency class <sup>3</sup>	Outlet water temp. at 35°C	/	A+++									
	Outlet water temp. at 55°C	/	A++									
Refrigerant	Type(GWP)	/	R32(675)									
	Charged volume	kg	1.15		1.25		1.78					
Sound power Level <sup>4</sup>	dB	60	60	63	65	70	72	72	70	72	72	
Net dimension(WxDxH)	mm	1000*450*725				1080*520*857						
Gross dimension(WxDxH)	mm	1110*475*870				1180*560*1005						
Container loading quantity(40HQ)	pcs	150				82						
Net weight/Gross weight	kg	70/82		75/87		108/120			115/127			
Water piping connection	inch	R1"		R1-1/4"								
Ambient temperature range	Cooling	°C										
	Heating	-5 ~ 43										
	DHW	-25 ~ 35										
Outlet water temp. setting range	Cooling	°C										
	Heating	5 ~ 25										
	DHW	25 ~ 65										
Backup electric heater <sup>5</sup>	Optional installation	kW	3/9	3/9	3/9	3/9	3/9	3/9	3/9	3/9	3/9	
	Capacity steps	/	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	
	Power Supply	3kW	V/Ph/Hz									
	9kW	220~240/1/50										
		380~415/3/50										

### Note

- Outdoor air temperature 7°CDB, 6°CWB; Water inlet 30°C, Water outlet 35°C;
- Outdoor air temperature 7°CDB, 6°CWB; Water inlet 40°C, Water outlet 45°C;
- Outdoor air temperature 7°CDB, 6°CWB; Water inlet 47°C, Water outlet 55°C;
- Outdoor air temperature 35°CDB, Water inlet 23°C, Water outlet 18°C;
- Outdoor air temperature 35°CDB, Water inlet 12°C, Water outlet 7°C;
- Seasonal space heating energy efficiency class testes in average climate general conditions;
- Testing standard: EN12102 -1;
- Backup electric heater is external installation;
- Relevant EU standards and legislation: EN 14511; EN 14825; EN 50564; ( EU ) No 811/2013; ( EU ) No 8813/2013; OJ 2014/C 207/02:2014.

## Split Series

Outdoor unit model	HPS-	V40W/R2	V60W/R2	V80W/R2	V100W/R2	V120W/R2	V140W/R2	V160W/R2	V120W/SR2	V140W/SR2	V160W/SR2		
Power Supply	V/Ph/Hz	220 240/1/50						380 415/3/50					
Heating <sup>1</sup>	Capacity	4.20	6.50	8.30	10.00	12.20	14.20	16.10	12.20	14.20	16.10		
	Rated Input	0.82	1.30	1.63	2.18	2.48	3.01	3.58	2.48	3.01	3.58		
	COP	/	5.12	5.00	5.10	4.58	4.92	4.72	4.50	4.92	4.50		
Heating <sup>2</sup>	Capacity	4.35	6.80	8.20	10.10	12.50	14.50	16.45	12.50	14.50	16.45		
	Rated Input	1.12	1.81	2.16	2.85	3.33	4.12	4.70	3.33	4.12	4.70		
	COP	/	3.90	3.76	3.80	3.55	3.75	3.52	3.50	3.75	3.52		
Heating <sup>3</sup>	Capacity	4.35	6.35	7.50	9.53	12.00	14.00	16.30	12.00	14.00	16.30		
	Rated Input	1.40	2.05	2.50	3.23	4.00	4.73	5.76	4.00	4.73	5.76		
	COP	/	3.10	3.10	3.00	2.95	3.00	2.96	2.83	3.00	2.96		
Cooling <sup>4</sup>	Capacity	4.40	6.50	8.40	10.00	12.10	14.10	16.20	12.10	14.10	16.20		
	Rated Input	0.77	1.25	1.68	2.33	2.63	3.16	3.68	2.63	3.16	3.68		
	EER	/	5.70	5.18	5.00	4.30	4.46	4.40	4.40	4.46	4.40		
Cooling <sup>5</sup>	Capacity	4.70	5.60	7.40	8.80	11.60	13.50	14.20	11.60	13.50	14.20		
	Rated Input	1.36	1.72	2.18	3.01	3.69	4.58	4.93	3.69	4.58	4.93		
	EER	/	3.45	3.26	3.40	2.92	3.14	2.95	2.88	3.14	2.95		
Seasonal space heating energy efficiency class <sup>3</sup>	Outlet water temp. at 35°C	/	A+++										
	Outlet water temp. at 55°C	/	A++										
Refrigerant	Type(GWP)	/	R32(675)										
	Charged volume	kg	1.5		1.6		1.84						
Sound power Level <sup>4</sup>	dB	60	60	63	65	70	72	72	70	72	72		
Net dimension(WxDxH)	mm	1040*450*725				1120*520*857							
Gross dimension(WxDxH)	mm	1110*475*870				1180*560*1005							
Container loading quantity(40HQ)	pcs	100				71							
Net weight/Gross weight	kg	57/69		62/74		95/107			102/114				
Connecting pipe diameter	Liquid	mm				6.35		9.52					
	Gas	mm				15.88		15.88					
Between indoor and outdoor unit	Height difference	m				≤20							
	Pipe length	m				2-30							
Additional refrigerant	Additional charge per meter	g/m				20		38					
	Max. pipe length without additional refrigerant	m				15							
Ambient temp. range	Cooling	°C											
	Heating	-5 ~ 43											
	Domestic hot water	°C											
		-25 ~ 35											
		-25 ~ 43											

### Note

- Outdoor air temperature 7°C DB, 6°C WB; Water inlet 30°C, Water outlet 35°C;
- Outdoor air temperature 7°C DB, 6°C WB; Water inlet 40°C, Water outlet 45°C;
- Outdoor air temperature 7°C DB, 6°C WB; Water inlet 47°C, Water outlet 55°C;
- Outdoor air temperature 35°C DB; Water inlet 23°C, Water outlet 18°C;
- Outdoor air temperature 35°C DB; Water inlet 12°C, water outlet 7°C;
- Seasonal space heating energy efficiency class testes in average climate general conditions;
- Testing standard: EN12102-1.

Hydronic box model		HM-60/DR2	HM-100/DR2	HM-160/DR2
Power supply	V/Ph/Hz	220~240/1/50		
Sound power Level <sup>1</sup>	dB	40	42	43
Net dimension(WxDxH)	mm	420*790*275		
Gross dimension(WxDxH)	mm	525*1050*360		
Container loading quantity(40HQ)	pcs			
Net weight/Gross weight	kg	37/43	37/43	39/45
Water pump	Type	inverter		
	Max. pump head	m		
		9		
Connecting pipe diameter	Water side	inch		
		R1"		
		R1-1/4"		
	Liquid	mm		9.52
	Gas	mm		15.88
Backup electric heater <sup>2</sup>	Optional installation	kW		3/9
	Capacity steps	/		1/3
	Power Supply	3kW	V/Ph/Hz	
	9kW	220-240/1/50		
		380-415/3/50		
Outlet water temp. setting range	Cooling	°C		
	Heating	5 ~ 25		
	DHW	°C		
		25 ~ 65		
		20 ~ 60		

### Note

- Testing standard: EN12102-1;
- Backup electric heater is external installation;
- Relevant EU standards and legislation: EN 14511; EN 14825; EN 50564; EN 12102; ( EU ) No 811/2013; ( EU ) No 813/2013; OJ 2014/C 207/02:2014.



Energy Saving &  
Environmental Friendly



Reliable operation



Intelligent control



Flexible application

# Polestar

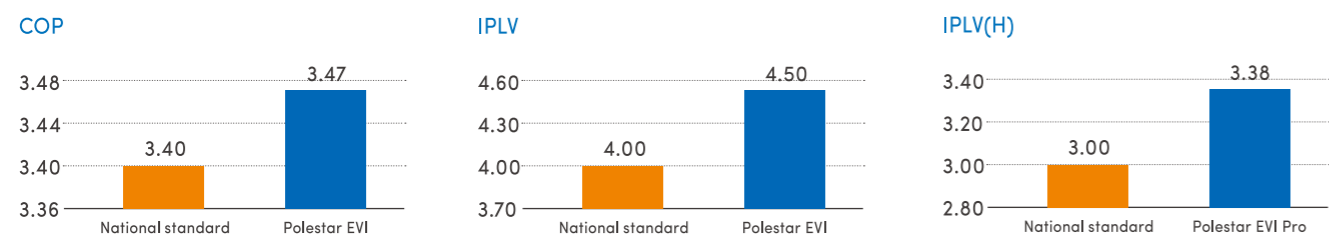




# Energy saving & environment-friendly

## Excellent energy efficiency

Polestar EVI, EVI Pro and INV series all exceed China national energy efficiency Class-I



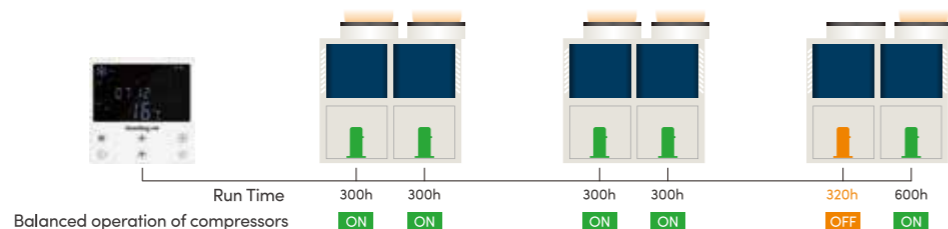
## AI learning

### Graded startup

Polestar can realize graded startup, reduce the startup current of the unit and reduce the impact on the power grid.

### Optimal starting up

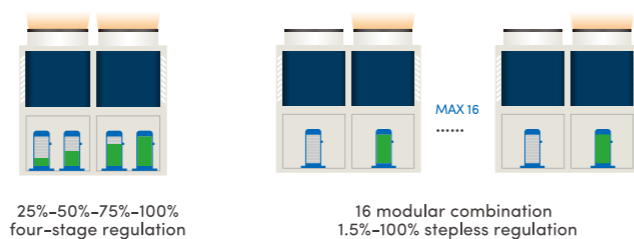
Through a detection and AI-learning function, the compressor and the unit with the best performance are searched and identified each start up, so as to reduce the system wear and prolong its service life cycle of the unit and to ensure the best performance and reliability of the unit.



## Low consumption and energy saving

### Multistage operation regulation

Polestar E, EVI and EVI Pro series can realize 25%-50%-75%-100% four-stage regulation in single unit, and 16 modular combination can realize 1.5%-100% stepless regulation, which can realize accurate output in partial load and reduce system energy consumption.



## Green and environment-friendly

### R410a environmental protection refrigerant

R410a refrigerant is used in the unit. R410a is a new type of environment friendly refrigerant, which is non-toxic, non-flammable, and zero ODP value. It does not destroy the ozone layer, has high refrigeration (heat) efficiency, and has the characteristics of high efficiency and environment-friendly.



# Reliable operation

### Brand parts to ensure excellent quality

- Axial flow aluminum alloy low noise fan
- High efficient water-side heat exchanger
- Y-type water filter
- High-precision throttling part
- High efficient hermetic compressor
- High efficient heat exchanger

<h4>Efficient hermetic compressor</h4> <ul style="list-style-type: none"> <li>Hermetic scroll compressor of international famous brand, scroll axial and radial flexible technology, reliable and efficient.</li> <li>Equipped with check valve so the safety co-efficient is higher; ultra-large capacity, super liquid impact resistance and long service life.</li> </ul>	<h4>Axial flow aluminum alloy low noise fan</h4> <ul style="list-style-type: none"> <li>Integrated axial flow aluminum alloy low noise fan with large air volume perfectly realizes aerodynamic performance.</li> <li>The unique tooth edge of the wing is designed with blades to effectively control air turbulence, reduce cyclone and wind noise.</li> </ul>	<h4>High efficient heat exchanger</h4> <ul style="list-style-type: none"> <li>Four sided fin heat exchanger with larger ventilation, high efficiency heat exchange with internally threaded tubes and higher heat exchange efficiency.</li> <li>The corrugated aluminum fin technology has fewer cuts, less corrosion and dust collection, and longer service life cycle.</li> </ul>
<h4>High efficient water-side heat exchanger</h4> <ul style="list-style-type: none"> <li>Stainless steel vacuum brazed plate heat exchanger and double system cross diagonal flow structure, so heat exchange is sufficient and more efficient.</li> </ul>	<h4>High-precision throttling part</h4> <ul style="list-style-type: none"> <li>High quality 480-class double electronic expansion valve with wide regulation range.</li> <li>Dynamic &amp; real-time matching according to actual load demand, with faster control speed and more accurate precision.</li> </ul>	<h4>Y-type water filter</h4> <ul style="list-style-type: none"> <li>20-mesh Y-type filter is equipped to prevent impurities from entering the system and affecting the performance and reliability of the unit, and facilitate the subsequent cleaning of the water system at the same time.</li> </ul>



# Anti-freezing & trouble-free operation



**Quadruple detection:**  
temp., pressure, temp. difference  
& pressure difference

Equipped with temperature and pressure sensors through real-time detection of temperature, pressure, temperature difference and pressure difference to analyse the water flow of the unit.



**Triple soft design:**  
water pressure difference sensor

Equipped with water pressure difference switch; when the water flow is too low, the water pressure difference switch is turned off, and the unit stops, so as to avoid freezing and cracking of evaporator caused by too low water temperature.



**Triple soft design:**  
water pump linkage control

Through linkage control of the water pump, when the water temperature is detected too low in standby status, the water pump is started firstly to circulate water to prevent the pipeline from freezing.



**Triple soft design:**  
compressor

In standby status, if the water temperature is still low after the water pump is turned on, the compressor will start until the water reaches the set temperature point.



## Quadruple detection and triple design anti-freezing

Real-time detection of quadruple hardware of temperature, pressure, pressure difference and temperature difference, and all-round anti-freezing protection of evaporator through triple soft design of water flow sensor, water pump and automatic operation of compressor to prevent frost crack, which is reliable and guaranteed.

## Intelligent defrosting & constant water temperature

- Multiple choice  
Automatic defrosting or manual defrosting can be selected.

- Intelligent judgment  
The unit can accurately judge the frosting situation through multivariable comprehensive evaluation so as to defrost when needed. At low ambient temperature, it can achieve no defrosting for up to 180 minutes, bringing longer heating time and higher comfort.

- Heating and defrosting without shutdown  
In a system with multiple compressors or modular combination, the defrosting unit is less than 1/2 of the total number of systems, which can realize defrosting and heating simultaneously, so as to avoid fluctuation of water temperature, and avoid cold air blowing.



## Intelligent protection, stable and reliable



# Smart control

## Smart building

Modbus protocol is available, and RS485 building communication interface is configured as standard. The unit can be connected to the building automatic control system and other building equipment for centralized control. Up to 64 systems can be connected and each system can be connected with 16 modular units, that is, up to 1024 modular units can be controlled in one system.



# User friendly & touch key controller

Large LED screen, easy to control, real time status display, and operation mode and outlet water temperature control.



### Group control

One wired controller can control maximum 16 units, whether the 16 units are from the same series or not.



### Time on/off function

On/off time could be set according to user's requirement, and system can realize unattended operation.



### Password lock function

Password lock is available for installation and safety purpose. You can set initial startup password after the unit installation and water system are confirmed ok.



### Self-diagnostic function

Real-time display of unit parameters and self-diagnosis of system errors, which can show up to 99 errors and is convenient for after-sale maintenance.



### Power-off Memory

The unit can automatically remember the unit settings before the power failure & automatically restore the original setting after power recovery.



### Long-distance communication

The long distance communication between the touch screen and the host can be up to 1000m, which is convenient for users to operate.

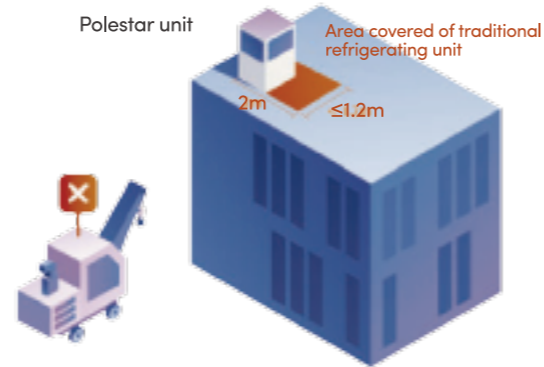
# Flexible application



## Flexible installation

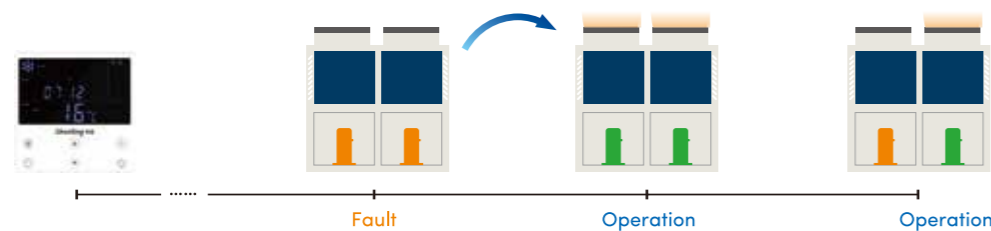
- Transport**  
 Compact design enable a minimum floor area is 1.27m<sup>2</sup>, which is 35% less than that of ordinary modular units in the market. Single system unit can be transported by elevator instead of crane, which reduces installation and transportation costs.
- System**  
 Air cooling system does not need cooling water system, cooling tower and cooling pump. With the simple design, convenient construction and short installation period, the investment cost is reduced.
- Space**  
 It can be installed outdoors, on the roof or other opening spaces without the necessity of special equipment room.
- Place**  
 It can be widely used in hospitals, schools, hotels, office buildings and other places.

The area cover reduced by 35%



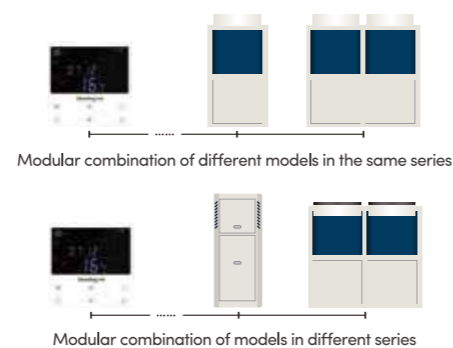
## Module mutual backup

- System mutual backup**  
 Different systems of the same unit are independent of each other. And the failure of any one system does not affect the operation of other systems.
- Module mutual backup**  
 Different units in the same water system are independent from each other, and the failure of any one unit does not affect the use other units, and the stable cooling/heating capacity is uninterrupted.
- Master and slave modules backup**  
 In modular combination, any unit can be operated as a master. And the failure of the master does not affect the stable operation of other slaves.
- Applicable to variable flow water system**  
 Two-way valve in water system, can be automatically opened or closed according to the load change of terminals, which supports the operation of DC water pump and saves energy during operation.



## Flexible configuration

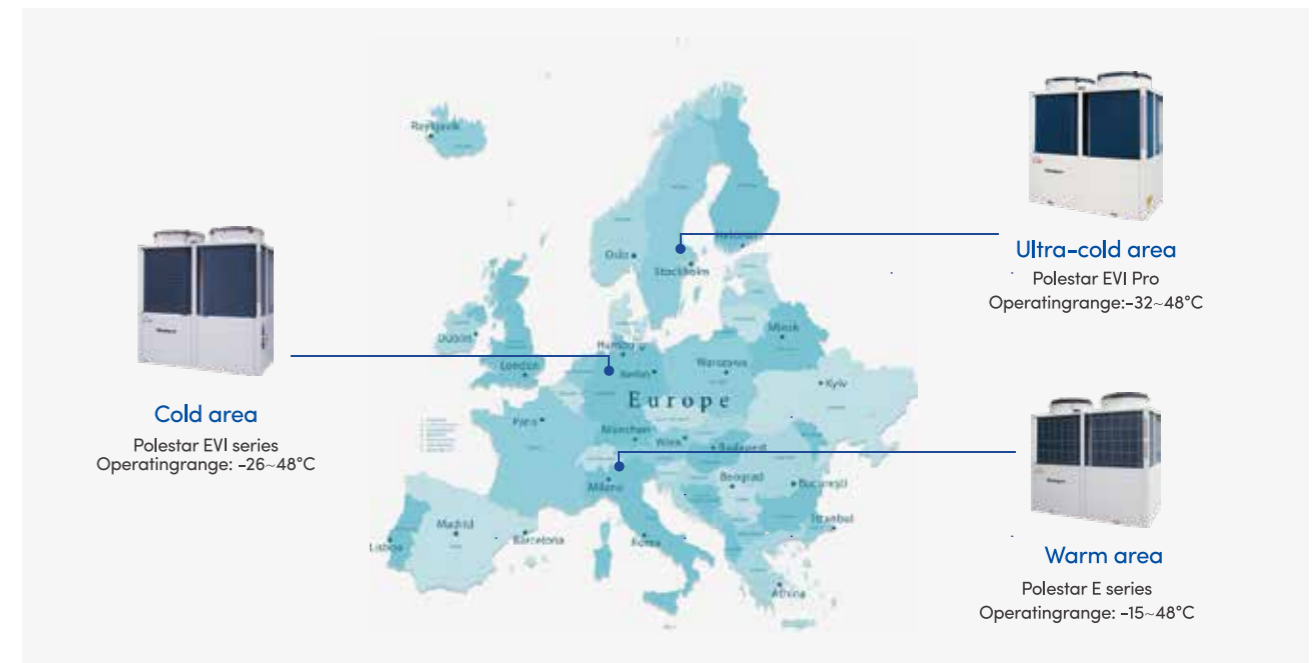
- Modular combination**  
 Modular design, offers the customer choice to invest and install in batches according to projects or funds, thus reducing initial investment costs. The modular combination of up to 16 units can be realized to meet the refrigerating demand of different projects.
- Interconnection control**  
 Modular combination can be realized among different models within the same series or models between different series, such as Polestar E and EVI.



# Complete lineup

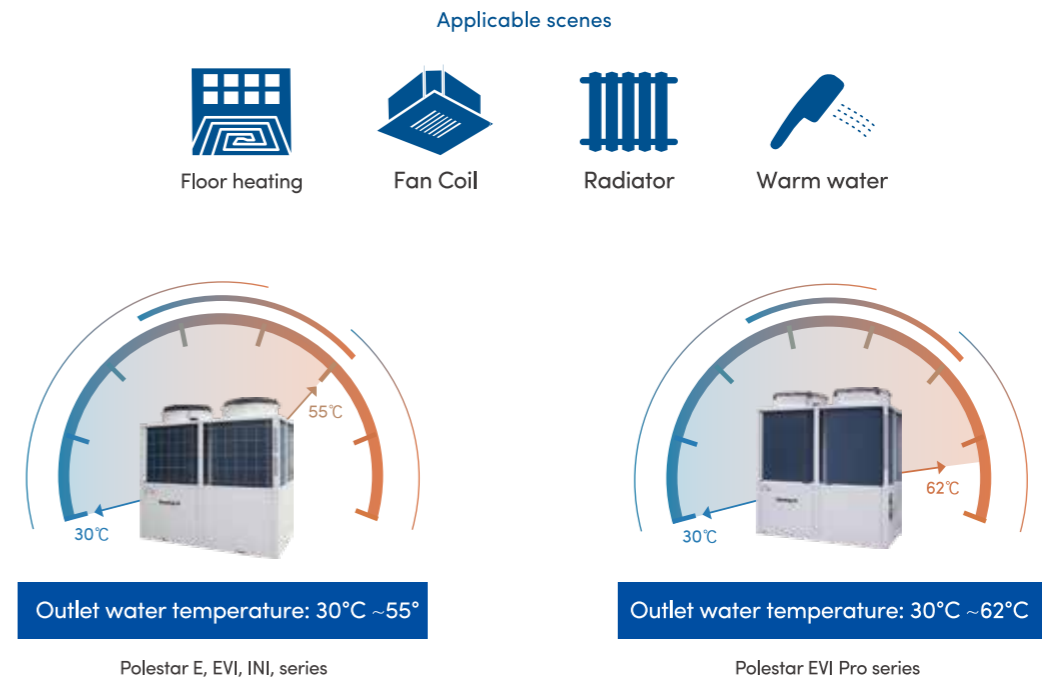
## Wide range operation

• Refrigeration can cover the ambient temperature of 5~48°C and heating can cover the ambient temperature of -32~30°C. Polestar series is applicable for different ambient temperature areas.

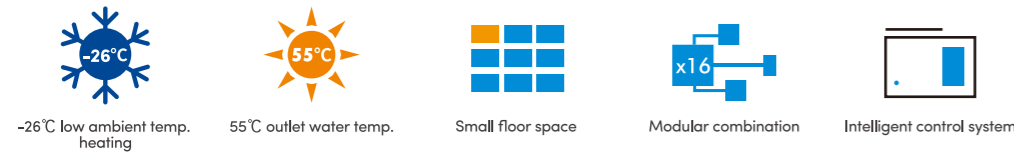


## Application at different terminals

• The heating outlet water temperature can cover 30~62°C, which can meet the needs of different terminals such as floor heating, fan coil & radiator.



# Polestar E series



## Reliable design

### Control technology of dual electronic expansion valves

A single system of the unit is equipped with multiple electronic expansion valves, which not only can avoid the shutdown risk caused by failure of the single electronic expansion valve, but also can realize the rapid and accurate adjustment of refrigerant according to the load demand and improve the heat exchange efficiency.

### Intelligent detection and control technology

The pressure sensor and temperature sensor can detect the system temperature and pressure in time and automatically adjust the system to ensure the safe and efficient operation of the unit.

### Advanced liquid hammer prevention technology

Equipped with electric heating belt for compressor crankcase and design of large-capacity gas-liquid separator to avoid a large amount of liquid refrigerant directly entering the compressor.

### Optimized design of electric control

Separation of strong and weak current, which is safe and reliable; troughing design makes wiring tidy and safe; anti-reverse connection design to avoid damage due to reverse connection unit of power cord; overload protection can automatically power off when current is too high; overall waterproof design with higher safety.



## Reliable design



### Basic module and varied splicing

As the basic module, polestar E series can be mixed and spliced with Polestar EVI series and other series to meet different engineering requirements.

### Water system operation guarantee

Each unit is equipped with Y-type filter and differential pressure sensor as standard. In case of water shortage, no water and dirty blockage of water system, the unit can be protected in time without damaging the evaporator.

### Variable primary flow system

The unit is equipped with a two-way valve control port as standard, which can automatically control the flow of water pump according to the actual flow demand, thus easily realizing the variable primary flow system.

## Easy maintenance



### Balanced layout for easy maintenance

Components of the unit are evenly distributed around the unit, and the lower half metal plate of the unit is fully enclosed and the unit can be inspected and maintained by disassembling the panel.

### Intelligent diagnosis and quick positioning

Automatically analyze the cause of the fault according to the operating parameters of the system, which can guide the quick solution of the unit malfunction.

# Polestar EVI series



## Enhanced vapor injection technology

### High efficient enhanced vapor injection compressor

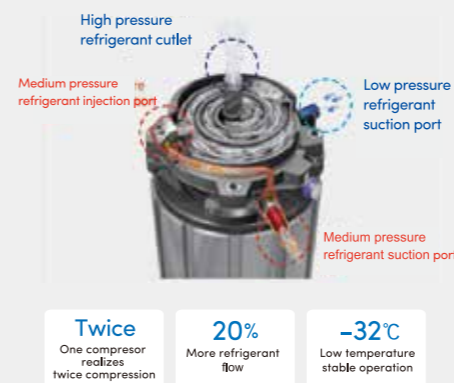
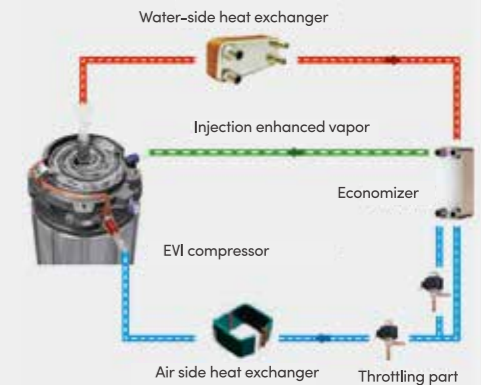
Through injection of the medium pressure vapor and remixing with the partially compressed refrigerant for recompression, Polestar EVI series can realize two-stage compression with a single compressor, which can increase the refrigerant flow in the condenser and the enthalpy difference of the main cycle circuit, and thus greatly improve the efficiency of the compressor.

### Efficient economizer

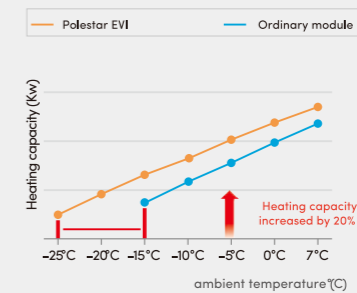
On the one hand, it can increase the degree of undercooling of the main circuit refrigerant in front of the valve; on the other hand, it can increase the degree of superheat of the auxiliary circuit refrigerant injection to the compressor, increase the system circulation and improve the performance of

### Auxiliary circuit electronic expansion valve control

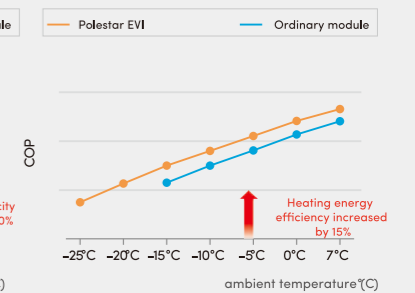
The auxiliary circuit is also controlled by high-precision electronic expansion valve, with advantages of wider adjustment range, higher precision, faster reaction speed and more stable system.



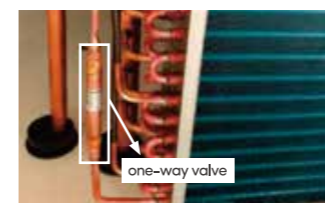
Comparison of heating capacity



Heating COP comparison

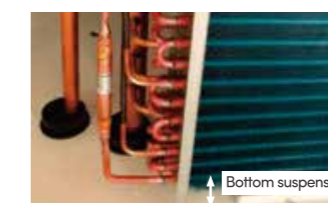


## 3 key design for reliable defrosting



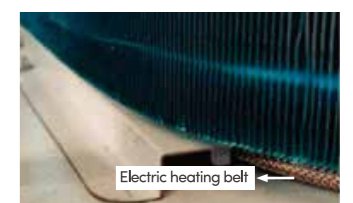
First design: One way-valve is set at the bottom of the heat exchanger

When heating, the one-way valve is closed without refrigerant passing to avoid frosting. When defrosting, the high-temperature refrigerant passes through the one way valve to defrost quickly.



Second design: Heat exchanger suspended from the bottom tray

Set a certain height distance difference between the bottom of the heat exchanger and the water tray to avoid ice accumulation, and quickly remove the condensed water during defrosting.



Third design: Water and electricity heating belt in heat exchange chassis

Automatically open at low temperature to prevent frost accumulation in water tray and ensure smooth drainage.

# Polestar EVI Pro series

- 32°C ultra-low ambient temp. heating
- IPLV(H) as high as 3.38
- Far beyond China energy efficiency Class-I
- 62°C ultra-high outlet water temp.
- Space heating/cooling /DHW

## New stable and reliable design

### Plum heat exchanger

- Unit 340 adopts plum pattern heat exchanger with air inlet from all sides. Heat exchange capacity is about 15% higher than that of two C-type units.

### U-tube dry shell-and-tube heat exchanger

- A new type of high-efficiency internal thread heat exchange tube with pure countercurrent is adopted, which has higher heat exchange efficiency. U-tube structure can reduce internal pressure loss, easy to clean and stronger anti-deposit ability.

### Ventilation column

- Ventilation column is adopted to increase ventilation and enhance heat exchange, and there is no dead angle in 360° for heat exchange.

### 4 side removable panel

- Components are evenly arranged around the machine, and removable panels are used to facilitate after-sale maintenance, which can reduce the noise of the unit and prolong the life cycle components.

### Compact structure & small floor space

- Unit 340 covers only 4.84m<sup>2</sup>, which is only 76% of the floor space of two unit 170 combined and the installation cost is low.

## One-stop solution

In the system, space heating, cooling and domestic hot water can be realized

In heating mode, the outlet water temperature can cover 30-62°C, which can meet the needs of different terminals such as floor heating, fan coil and radiator.

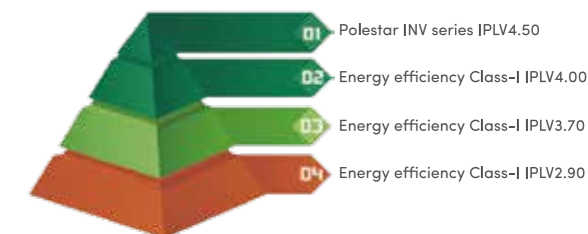


# Polestar INV series

- IPLV is as high as 4.50
- Constant water temperature
- Far beyond China national energy efficiency Class-I
- Stepless adjustment accurate control
- Fixed-variable mix control
- Low noise operation

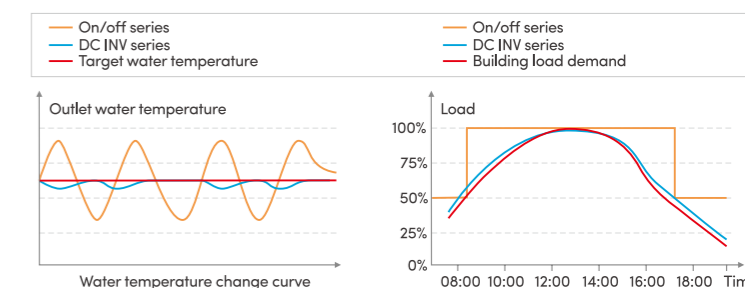
## Beyond China national energy efficiency Class-I

- Polestar INV series uses R410A environment friendly refrigerant.
- IPLV is as high as 4.50, exceeding China national energy efficiency Class-I by 12.5%.

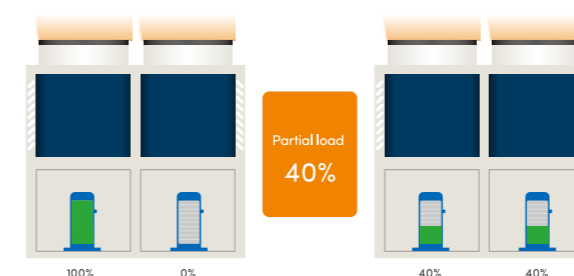


## Adaptive Requirements

DC inverter compression can adjust the operating frequency according to the actual load demand of the building to reduce energy consumption. Through frequency stepless adjustment, it can stabilize the outlet water temperature and keep more stable indoor temperature.



## Intelligent distribution and efficient operation



The unit carries out the capacity calculation and makes the optimal allocation according to the terminal load demand, so that each unit can be operated in the high efficiency area to reduce the loss during full-load operation which is efficient and can save energy.

## Low noise operation, better application experience

Low-noise components and safe control are adopted to optimize the structure of the unit, and realize low-nose operation of the unit. In the mute mode, the noise can be reduced by 6-10dB(A), providing customers a high-quality experience.

- Closed structure**  
Lower-half closed design, effectively isolate the noise transmission of the unit.
- Low noise axial fan**  
Optimal design of fan blade, restrain air turbulence, reduce noise.
- Mute mode**  
Mute optional mode, quiet operation without noise.
- Mute defrosting**  
Reduce compressor frequency to reduce reversing noise when defrosting.
- Low noise DC Inverter compressor**  
DC inverter compressor, vibration reduction design, sound-absorbing cotton design optional.



# Specification

Polestar E Series			LSQRF068PSE	LSQRF135PSE	LSQRF270PSE
Heating(nominal)	Capacity	kW	72	144	288
	Power input	kW	20.2	41.0	86.7
Cooling(nominal)	Capacity	kW	68	135	270
	Power input	kW	20.1	39.9	84.3
Power supply	/		380V/3N~/50Hz		
Maximum operating current	A		52	104	208
Refrigerant	/		R410A		
Throttling device	/		Electronic expansion valve		
Compressor	Type	/			
	Quantity		1	2	4
FAN	Type	/			
	Quantity		1	2	4
Water-side heat exchanger	Type	/			
	Water flow	m <sup>3</sup> /h	11.7	23.2	46.4
Unit water resistance	kPa		30	40	40
Water piping connection	inch		R 1-1/2"	R2-1/2"	R2-1/2"
Power cord	Live wire sectional area	mm <sup>2</sup>	≥16	≥35	≥95
	Live wire quantity	/	3	3	3
	Neutral wire sectional area	mm <sup>2</sup>	≥16	≥16	≥50
	Neutral wire quantity	/	1	1	1
	Earth wire sectional area	mm <sup>2</sup>	≥16	≥16	≥50
	Earth wire quantity	/	1	1	1
Net dimension	L x W x H	mm	1150x1100x2100	2200x1150x2100	24900x2210x2600
Net weight	kg		450	930	1800
Wired controller	/		PJAC-T-A301XY		
Container loading quantity(40HQ)	pcs		20	10	5
Heating	Ambient temp. range	°C	-15~30		
	Outlet water temp. range	°C	30~55		
Cooling	Ambient temp. range	°C	5~48		
	Outlet water temp. range	°C	5~20		

## Note

- Nominal cooling capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 7°C and outdoor ambient dry bulb temperature at 35°C.
- Nominal heating capacity test condition: rated water flow at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 45°C and outdoor ambient dry bulb/wet bulb temperature at 7/6°C.
- Low temperature heating capacity test condition: rated water flow at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 41°C and outdoor ambient dry bulb/wet bulb temperature at -12/-14°C.
- The performance may be adjusted due to product improvement without prior notice. Please refer to the nameplate for specific parameters.

Polestar EVI Series			LSQRF075PLH	LSQRF135PLH	LSQRF150PLH	LSQRF320PLH
Heating(nominal)	Capacity	kW	80	144	160	320
	Power input	kW	22.3	40.1	44.6	89.2
Heating(low ambient temp.)	Capacity	kW	59	104	118	236
	Power input	kW	21.8	38.4	43.5	87.0
Cooling(nominal)	Capacity	kW	76	135	152	304
	Power input	kW	21.9	38.9	43.8	87.6
Power supply	/		380V/3N~/50Hz			
Maximum operating current	A		54	94	100	200
Refrigerant	/		R410A			
Throttling device	/		Electronic expansion valve			
Compressor	Type	/				
	Quantity		1	2	2	4
Water-side heat exchanger	Type	/				
	Water flow	m <sup>3</sup> /h	13.1	23.2	26.1	52.3
Unit water resistance	kPa		45	40	48	40
Water piping connection	inch		R1-1/2"	R 2-1/2"	R 2-1/2"	R 3"
Power cord	Live wire sectional area	mm <sup>2</sup>	≥16	≥35	≥35	≥95
	Live wire quantity	/	3	3	3	3
	Neutral line sectional area	mm <sup>2</sup>	≥16	≥16	≥16	≥50
	Neutral line quantity	/	1	1	1	1
	Earth wire sectional area	mm <sup>2</sup>	≥16	≥16	≥16	≥50
	Earth wire quantity	/	1	1	1	1
Net dimension	L x W x H	mm	1150x1100x2300	2200x1150x2100	2200x1150x2300	2490x2210x2600
Net weight	kg		450	930	950	1900
Wired controller	/		PJAC-T-A301XY			
Container loading quantity(40HQ)	pcs		20	10	10	5
Heating	Ambient temp. range	°C	-26~30			
	Outlet water temp. range	°C	30~55			
Cooling	Ambient temp. range	°C	5~48			
	Outlet water temp. range	°C	5~20			

## Note

- Nominal cooling capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 7°C and outdoor ambient dry bulb temperature at 35°C.
- Nominal heating capacity test condition: rated water flow at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 45°C and outdoor ambient dry bulb/wet bulb temperature at 7/6°C.
- Low temperature heating capacity test condition: rated water flow at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 41°C and outdoor ambient dry bulb/wet bulb temperature at -12/-14°C.
- The performance may be adjusted due to product improvement without prior notice. Please refer to the nameplate for specific parameters.



# Specification

## Polestar EVI Pro Series

Model			SAH170AR1DST	SAH340AR1DST
Heating(nominal)	Capacity	kW	170	340
	Power input	kW	46	92
Heating(low ambient temp.)	Capacity	kW	110	220
	Power input	kW	40.5	81.0
Cooling(nominal)	Capacity	kW	150	300
	Power input	kW	44.6	89.2
IPLV(H)		/	3.38	3.38
Maximum operating current		A	112	224
Power supply		/	380V/3N~/50HZ	
Refrigerant		/	R410A	
Throttling device		/	Electronic expansion valve	
Compressor	Type	/	EVI enhanced vapor injection compressor	
	Quantity	/	2	4
Water-side heat exchanger	Type	/	Efficient shell-and-tube heat exchanger	
	Water flow	m <sup>3</sup> /h	25.8	51.6
Unit water resistance		kPa	45	45
Water piping connection		inch	R2-1/2"	R3"
Power cord	Live wire sectional area	mm <sup>2</sup>	≥35	≥95
	Live wire quantity	/	3	3
	Natural wire sectional area	mm <sup>2</sup>	≥16	≥50
	Natural wire quantity	/	1	1
	Earth wire sectional area	mm <sup>2</sup>	≥16	≥50
	Earth wire quantity	/	1	1
Net dimension	L × W × H	mm	2200x1150x2385	2490x2210x2600
Net weight		kg	1000	1900
Wired controller		/	PJAC-T-A301XY	
Container loading quantity(40HQ)		pcs	10	5
Heating	Ambient temp. range	°C	-32~30	
	Outlet water temp. range	°C	30~62	
Cooling	Ambient temp. range	°C	5~48	
	Outlet water temp. range	°C	5~20	

### Note

- Low ambient temp. heating capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outdoor ambient dry bulb/wet bulb temperature at -12/-14°C and outlet water temperature at 41°C.
- Nominal heating capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outdoor ambient dry bulb/wet bulb temperature at 7/6°C outlet water temperature at 45°C.
- Nominal cooling capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outdoor ambient dry bulb temperature at 35°C and outlet water temperature at 7°C.
- The performance may be adjusted due to product improvement without prior notice. Please refer to the nameplate for specific parameters.

## Polestar INV Series

Model			LSQRF075PLV	LSQRF150PLV
Heating(nominal)	Capacity	kW	80	160
	Power input	kW	23.4	46.8
Cooling(nominal)	Capacity	kW	75	150
	Power input	kW	22.7	45.4
Power supply		/	4.50	4.50
Maximum operating current		/	380V/3N~/50HZ	
Refrigerant		/	R410A	
Throttling device		/	Electronic expansion valve	
Compressor	Type	/	DC compressor	
	Quantity	/	1	2
Water-side heat exchanger	Type	/	Efficient vacuum brazing plate heat exchanger	
	Water flow	m <sup>3</sup> /h	12.9	25.8
Unit water resistance		kPa	45	48
Water piping connection		inch	R1-1/2"	R 2-1/2"
Power cord	Live wire sectional area	mm <sup>2</sup>	≥16	≥35
	Live wire quantity	/	3	3
	Natural wire sectional area	mm <sup>2</sup>	≥16	≥16
	Natural wire quantity	/	1	1
	Earth wire sectional area	mm <sup>2</sup>	≥16	≥16
Net dimension	L × W × H	mm	1150x1100x2300	2200x1150x2300
		kg	440	930
Wired controller		/	PJAC-T-A301XY	
Container loading quantity(40HQ)		pcs	20	10
Heating	Ambient temp. range	°C	-26~30	
	Outlet water temp. range	°C	30~55	
Cooling	Ambient temp. range	°C	5~48	
	Outlet water temp. range	°C	5~20	

### Note

- Nominal cooling capacity test condition: rated water flow rate at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 7°C and outdoor ambient dry bulb temperature at 35°C.
- Nominal heating capacity test working condition: rated water flow at 0.172m<sup>3</sup>/(h·kW), outlet water temperature at 45°C and outdoor ambient dry bulb/wet bulb temperature at 7/6°C.
- Unit water resistance include unit water pressure drop and attached Y-filter water pressure drop.
- The performance may be adjusted due to product improvement without prior notice. Please refer to the nameplate for specific parameters.





## What is Shenling looking forward to

Alongside air source heat pump, Shenling has been studying in the field of renewable energy and an independent energy system of "energy supply - energy storage - energy use", and will soon provide European and global users packaged green solution with clean heating, clean energy and energy management.



# In the future

## Shenling Smart Eco Energy System

