

R290 ATW Heat Pump

GD Shenling Thermal Tech Co., Ltd

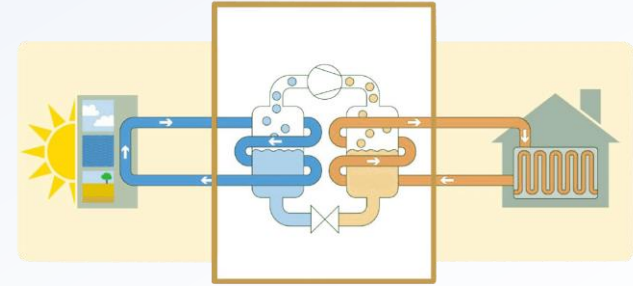


01

General Information

Working principle

Based on Air to Water heat pump technology, it captures heat energy from the ambient air and transfers it to heat the water that is used to warm your home and supply domestic hot water, it can even cool your home as required. Compared to other technologies, heat pump get a lot of heat from the air at a very low cost of electricity. So it has higher energy efficiency.



Preface

Basic Mode: Cooling/Heating/DHW

Terminal Type: Fan coil/Radiator/Underfloor Heating/DHW



Product Line-up

Line-up	Application	Energy label	Certification	Operation range
Standard Mono 1 ø 6/9/12/15kW 3 ø 12/15/18/22kW 		 Space Heating  	   MCS 	-25~43°C(Ambient) 25~75°C(Heating) 20~70°C(DHW) 5~25°C(Cooling)
Hydro Series 1 ø 9kW 3 ø 12/15kW 		 Space Heating  	   MCS 	
Commercial Series 3 ø 45kW 		 Space Heating  	To be acquired	

Note:

1.18/22kW can be up to A+++ at 55°C.

2.Hydro box is mainly for Germany market.

02

Standard Mono

Product Line-up

ThermaX R290 Mono(Standard)



6kW 1Ph



9kW 1Ph

12/15kW 1Ph/3Ph



18/22kW 3Ph



4inch 86×86×11mm

- Energy label: A+++ at 35°C A++ at 55°C

- Application:



Cooling



Heating



DHW



+



+



Auto

- Min operation ambient temp: -25°C
- Max water outlet temp: 75°C
- 4 inch Touch screen wire controller
- WIFI smart control and IOT&OTA function
- Smart weather curve control
- Smart Grid
- Disinfection



Bundesamt
für Wirtschaft und
Ausfuhrkontrolle



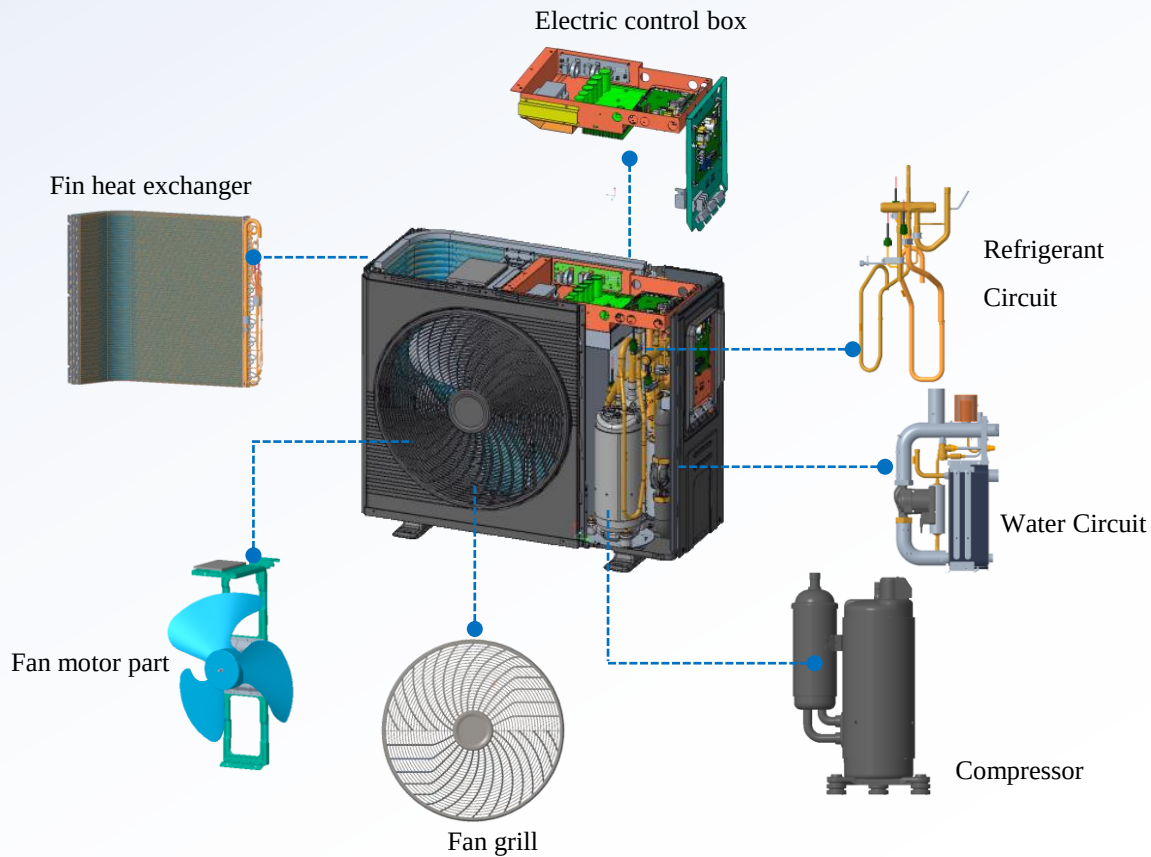
MCS



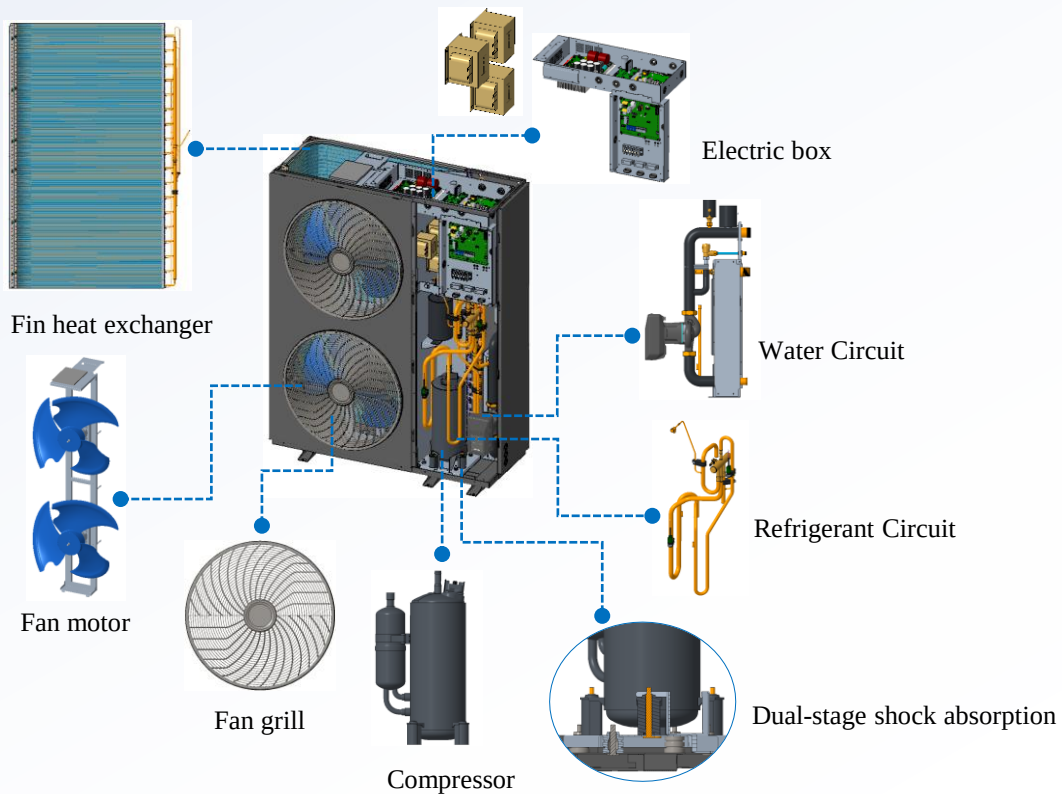
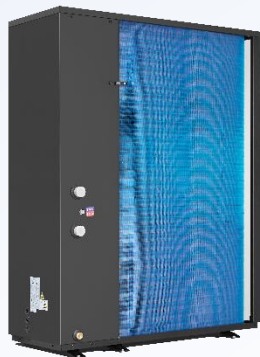
DC Inverter



R290 Mono (Standard)



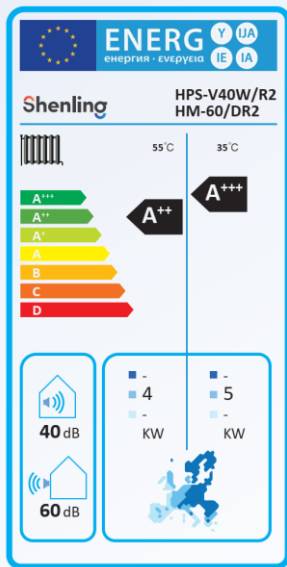
18/22kW Double fan



ErP directive

η_s : average up to **A+++** at 35°C

η_s : average up to **A++** at 55°C



Full Inverter



DC
Compressor

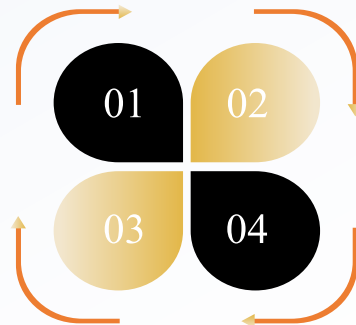


DC
Fan Motor

PHE



DC
Water Pump



Note: 18/22kW can be up to A+++ at 55°C.

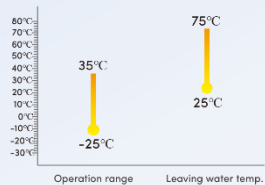


Wide Operation Range

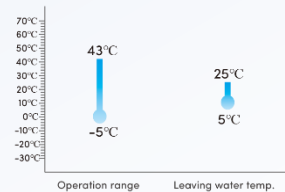


Space Heating

70°C water temperature at -15°C.

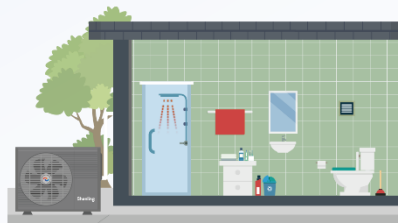
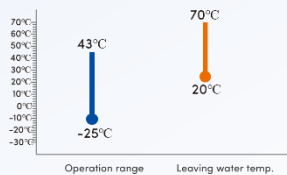


Space Cooling



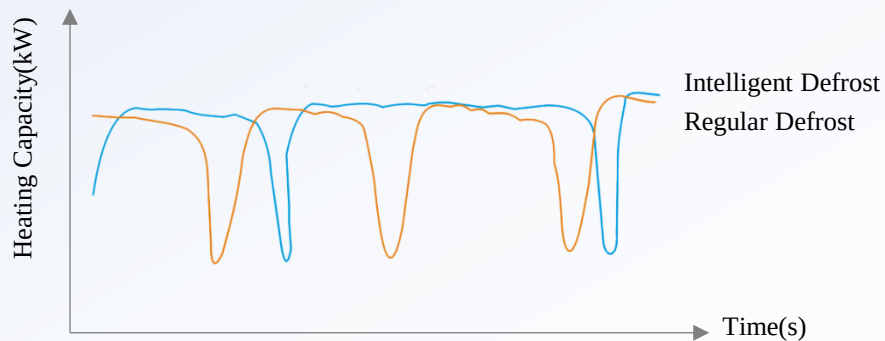
DHW

80°C water temperature with boost heater.



Intelligent defrost

ThermaX uses smart defrosting technology to figure out the exact defrosting time and start intelligent defrosting according to the real frosting condition, which reduces energy consumption under low temp. environment and prevents defrosting errors.



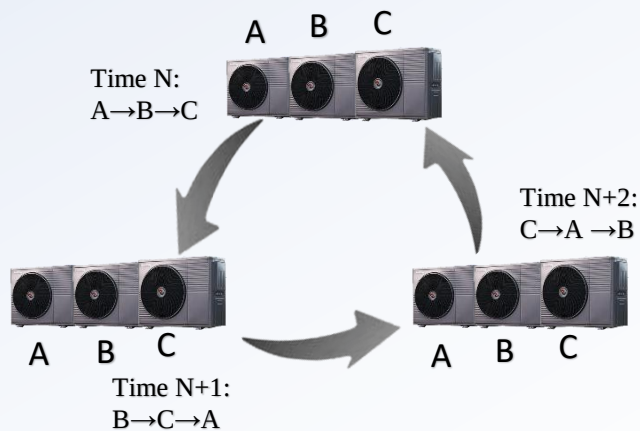
Anti freezing

ThermaX adopts 3 layers of anti-freeze protections. When low ambient temp. and water temp. detected, **water pump** started first. When situation staying unimproved, **electric booster heater** will be started (if equipped). If still unimproved, **heat pump** will be started.



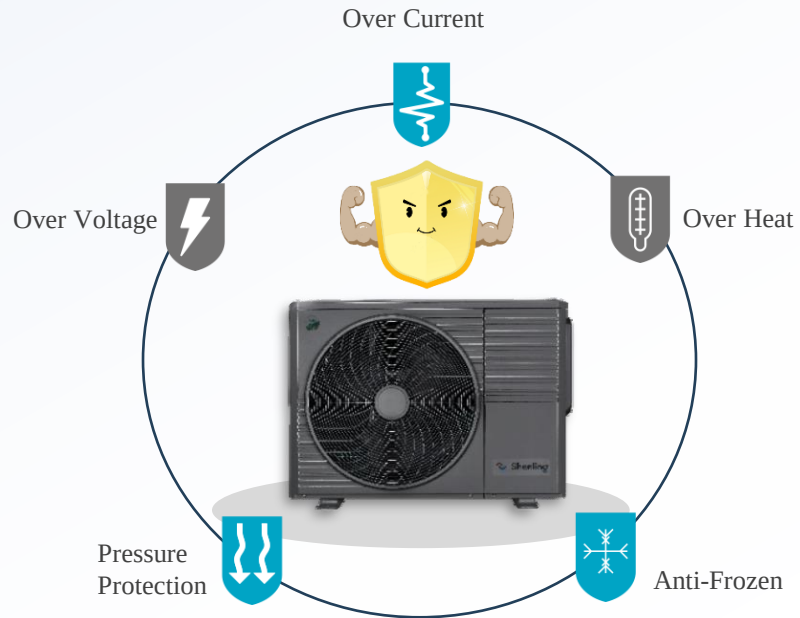
Rotating Operation

In one combination system, according to the accumulated operation time, all units operates as alternative in cycle, which increases reliability and balances units lifespan.



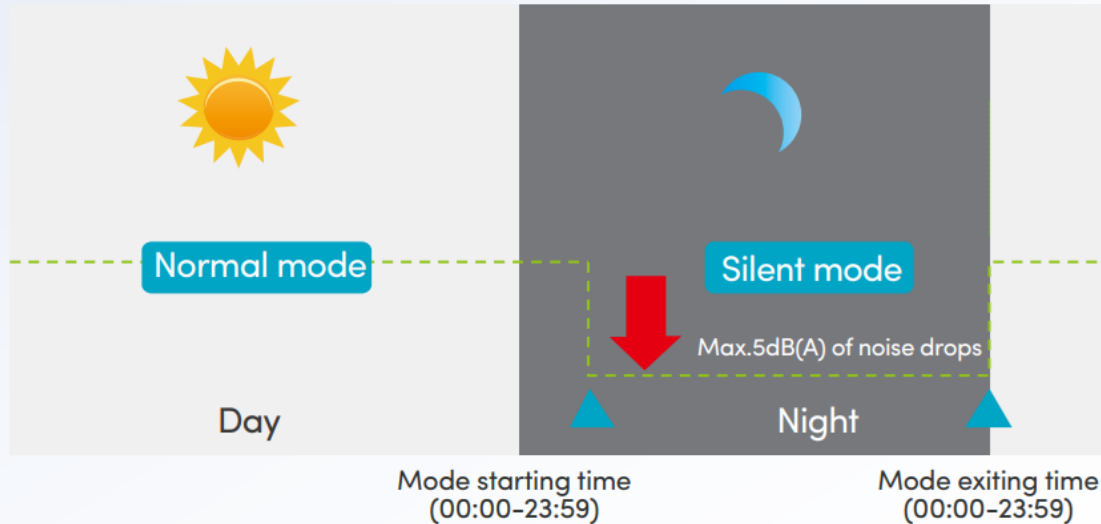
Multi Protection

There are various protections to ensure the stable and long term operation of the entire system.



Silent Mode

- Silent mode will decrease the noise by reducing the compressor and fan motor speed.
- User can set a timer for silent mode to meet the noise requirement for different time period.

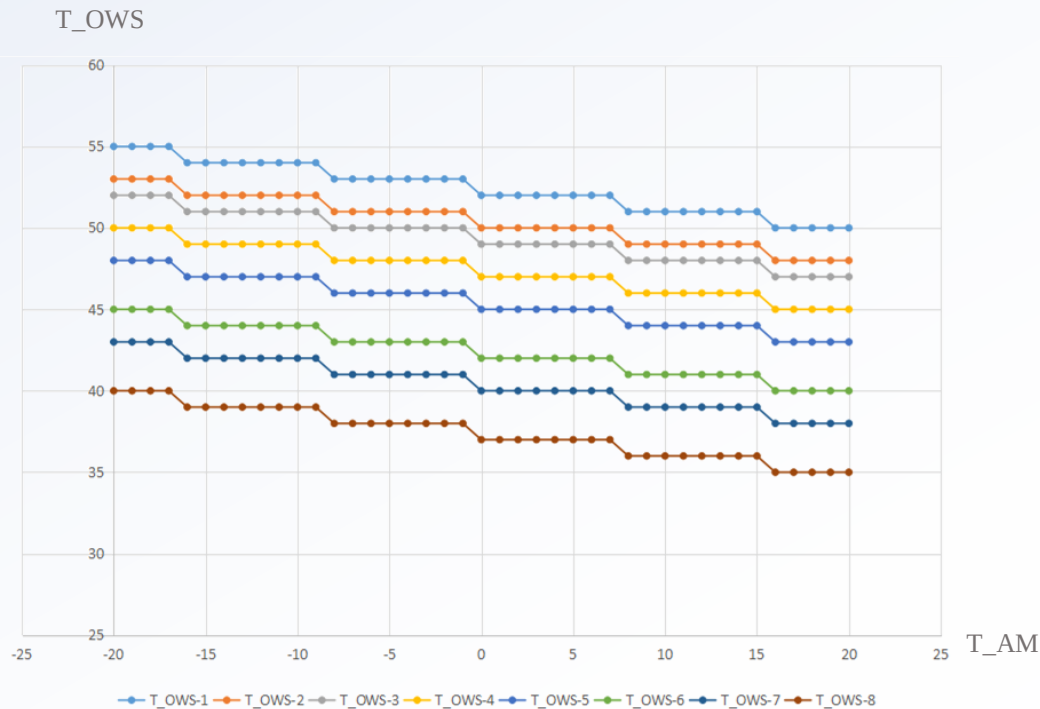


5dB(A) noise decrease

By entering night silent mode and defining mode starting and exiting times as desired.

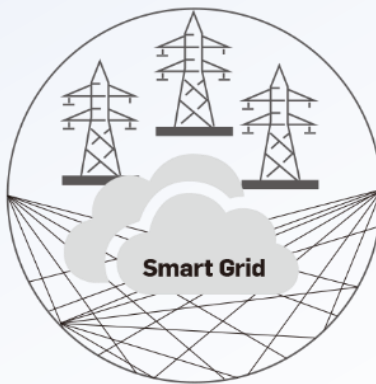
Weather Curve

ThermaX will vary the target water temperature based on outdoor ambient temperature automatically to realize the best way for energy saving and comfort.



Smart Grid

ThermaX heat pump can detect various electrical signals from the grid and make adjustments accordingly. By identifying peak and off-peak electricity prices, ThermaX prioritizes domestic hot water production during low-price periods and imposes a maximum output limit during high-price periods.



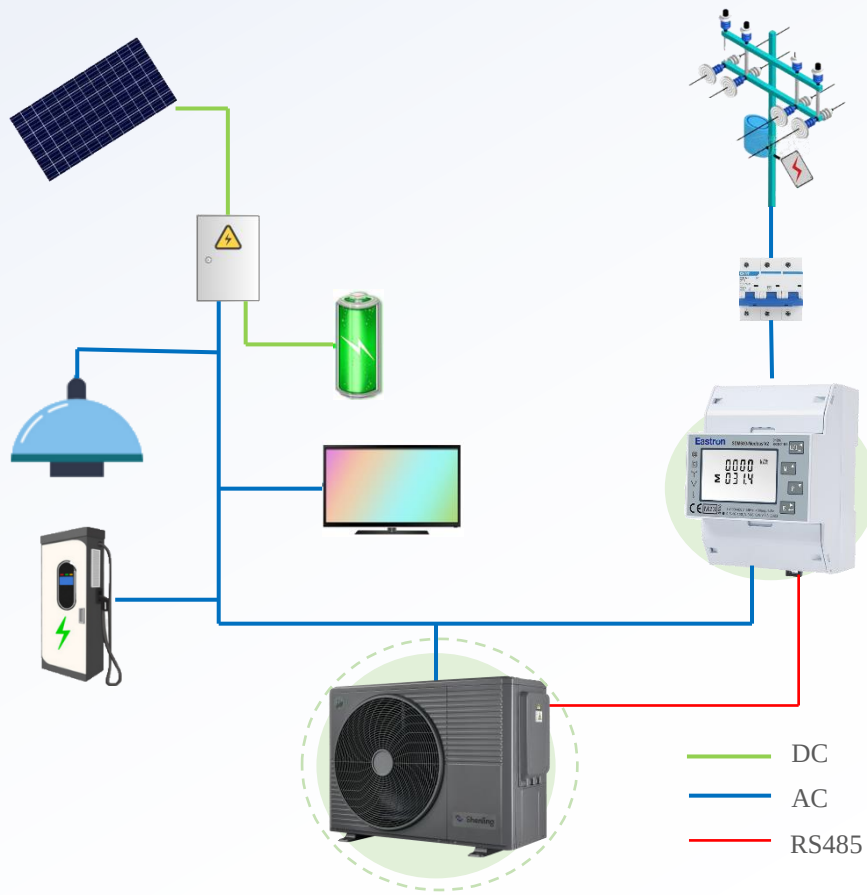
Energy States	Description	
	Smart Grid (contact)	
	Operation Mode	Power Supply Status
SG1	Operation Off	
SG2	Normal	
SG3	On Recommend	
SG4	On Command	

Main Function

Smart Meter

Shenling can provide the smart meter with heat pump. When PV power generation is sufficient, Smart meter will detect the power which will flow into the grid. and use it for heat pump, so as to maximize the internal utilization of PV generation to avoid selling the PV power to the grid at a lower price

Note: Smart meter is optional

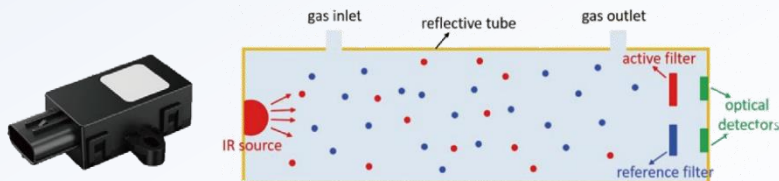


Main Function

Refrigerant leakage detect(Optional)

Shenling R290 Heat Pump equipped with the refrigerant leak sensor. When the system has R290 leakage, the unit will stop to make sure end users safe.

- Smart NDIR gas module
- High sensitivity
- Temperature compensation
- High resolution & Fast response
- Excellent linear output
- Anti-vapor interference



Chassis electric heating (Optional)

Shenling provide the chassis electric heating in case that the chassis get frozen cause of the poor drainage when the ambient temperature is very low in winter.

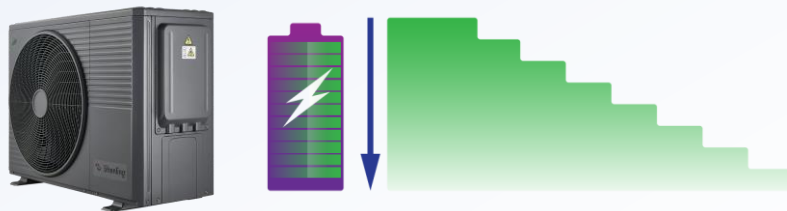




Main Function

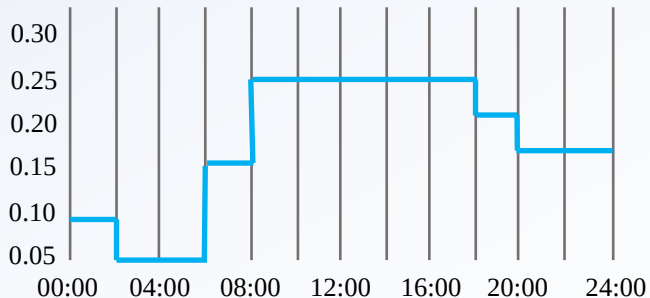
Power Limit Function

In the case of insufficient power, especially when using multiple electrical devices, users can select a predefined configuration (6 different levels) on the wired controller to limit the output of the heat pump and reduce the load on the power supply equipment.



Spot Price

USD/kWh



Spot Time Function

According to the spot price of the local power grid, a day can be roughly divided into 8 time periods. The user can set the mode, target temperature, maximum frequency limit and timer based on the spot price of the power grid.



Main Function

Holiday away

The Holiday Away mode is designed to enhance system reliability and energy efficiency. During this mode, the unit operates in heating mode or DHW mode with a low water outlet temperature to prevent freezing in the water circuit. Additionally, users have the option to pre-set the disinfection mode before returning home to ensure the water is free from bacteria when they use it.



Holiday home

The Holiday Home mode allows you to deviate from your normal schedule without the need to make adjustments during your time at home.



Main Function

Disinfection

The heat pump can activate booster heater, auxiliary or tank booster to heat the water in the tank and eliminate bacteria.



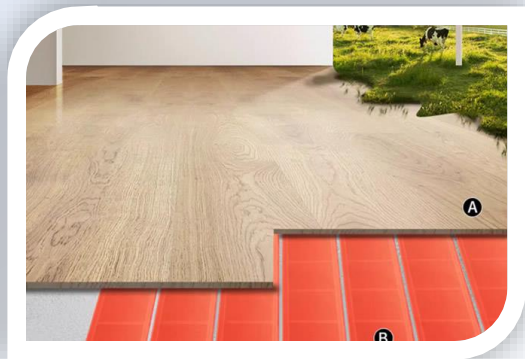
Auxiliary Heaters

There are multi auxiliary heat sources could be add to the heat pump system to meet an increased demand for hot water.





Main Function

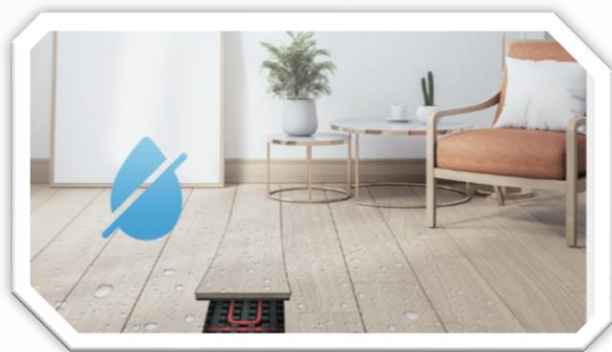


Floor Drying

Before initiating the floor heating, it's important to note that excess water on the floor surface can potentially cause warping or even rupturing during the heating process. To address this concern, we offer a drying function after the initial installation of the floor heating loop. During this process, the temperature gradually increases, remains at a certain level for a specified duration, and then gradually decreases.

Floor Preheating

To prevent the floor from cracking due to rapid water temperature increases, we recommend slowly raising the floor's water temperature within a range of 25°C to 35°C, with 25°C set as the default.



Main Function

Cascade System

The modular combination design is intended for capacity expansion in specific cases when there is a need for high cooling/heating capacity.

In a modular combination setup, one controller can manage up to 8 units within a group.

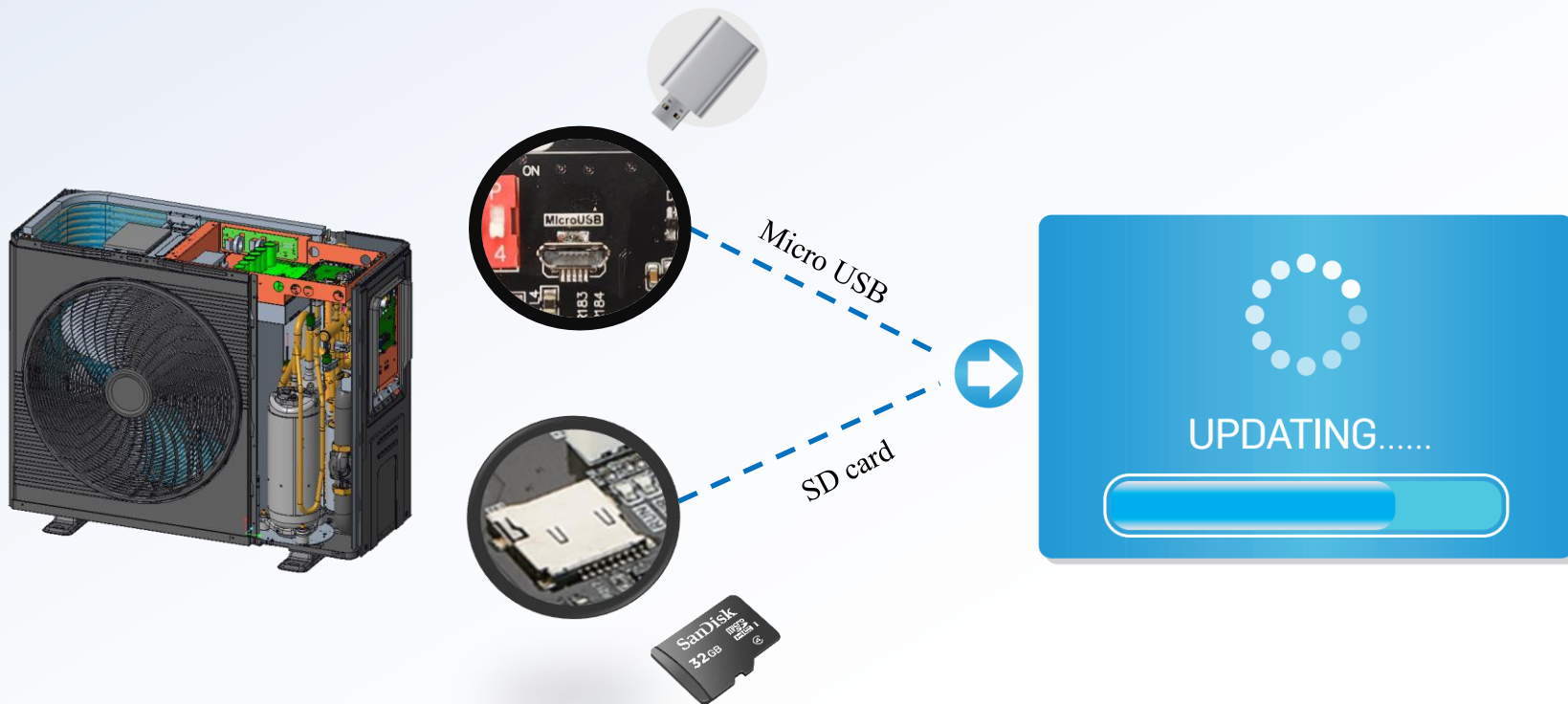
Max.8





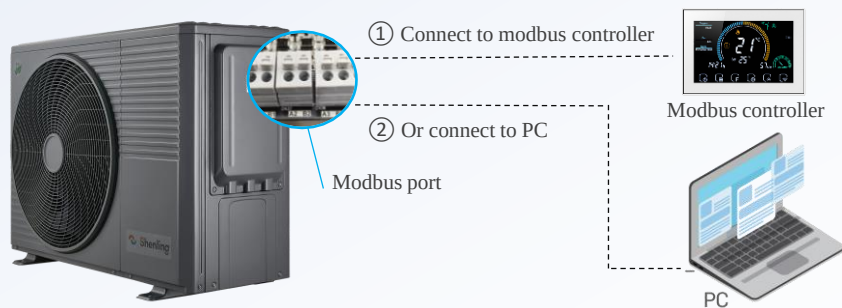
USB/SD card Update

Installer can finish the software upgrade only by one micro USB cable(or SD card) and one laptop.



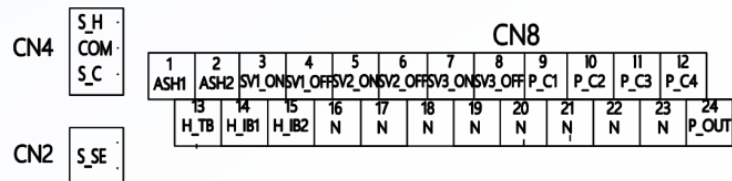
Modbus Communication

ThermaX Heat Pump provides a free Modbus port(CN37 A B), allowing users to connect it with third-party Building Management Systems (BMS).



Dry Contact

ThermaX Heat Pump provides many dry contact port that can connect with the AHS, Solar, E-heater and also Secondary water pump to achieve the intelligent control.



Wire Controller

The built-in WIFI module allows for easy remote control via your mobile phone when you are away from home.



86 Touch screen

- Mode control
- Daily/Weekly timer
- Weather Curve control
- Holiday Function
- Disinfection
- Force defrosting
- System update by WIFI or SD card

WIFI Control

1) APP

- Easy to read and set
- Dual temperature zone control
- weekly/daily timer
- Silent mode/holiday
- Remote monitor
- Fault alarm
- Multi language control
- Android & IOS version

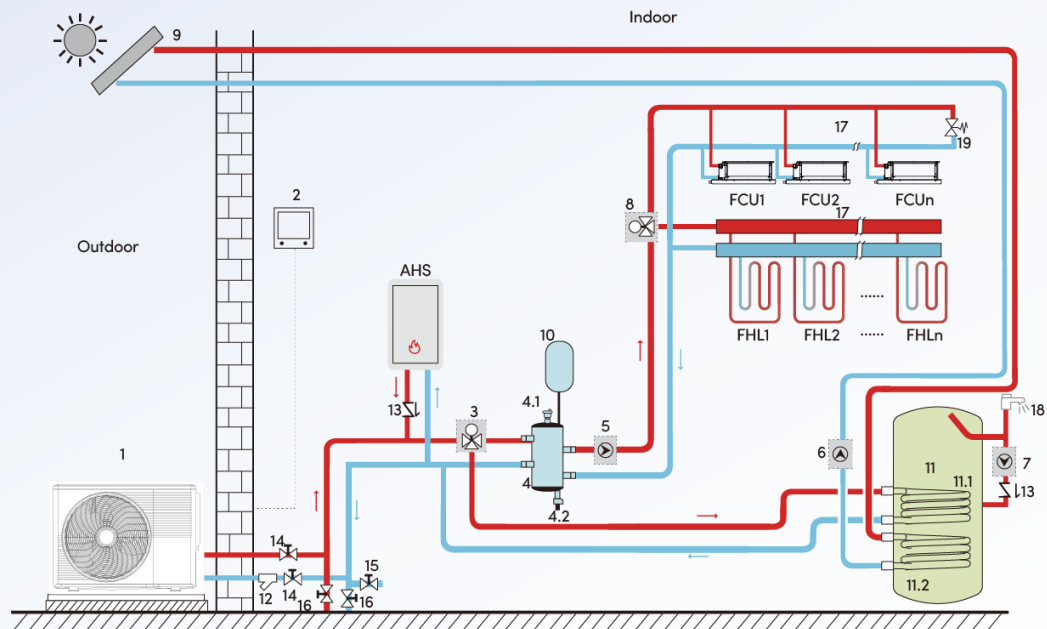
2) Web

- User&Device management
- Remote monitor
- Historical data curve
- Faulty alarm
- OTA remote upgrade(Super admin)



Typical Application

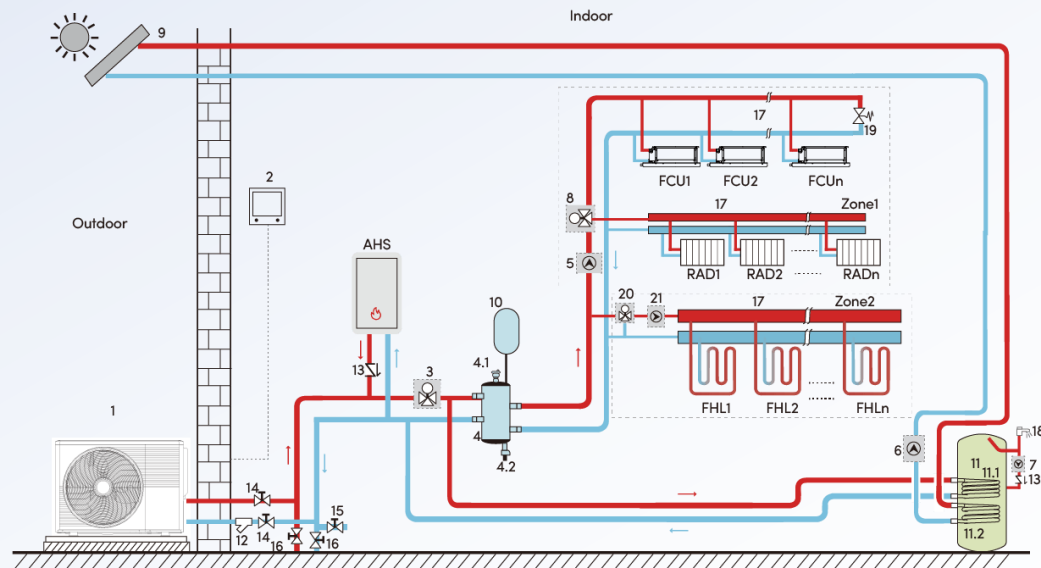
Single Zone



No.	Definition	Remark
1	ThermaX heat pump	
2	User interface	Accessory
3	SV1: DHW switch valve (3-way)	Field supply
4	Buffer tank	Field supply
4.1	Automatic air purge valve	
4.2	Drainage valve	
5	P_C1: Circulation pump	Field supply
6	P_C3: Circulation pump for solar panel	Field supply
7	P_C4: Circulation pump for DHW	Field supply
8	SV3: Heating/cooling switch valve (3-way)	Field supply
9	Solar panel	Field supply
10	Expansion vessel	Field supply
11	Domestic hot water tank	Field supply
11.1	Coil 1: heat exchanger for heat pump	
11.2	Coil 2: heat exchanger for solar thermal	
12	Y-shape filter	Accessory
13	Check valve	Field supply
14	Shut-off valve	Field supply
15	Water filling valve	Field supply
16	Drainage valve	Field supply
17	Water collector/distributor	Field supply
18	Hot water tap	Field supply
19	Bypass valve	Field supply
AHS	Auxiliary heat source	Field supply
FHL	Floor heating loop	Field supply
FCU	Fan coil unit	Field supply

Typical Application

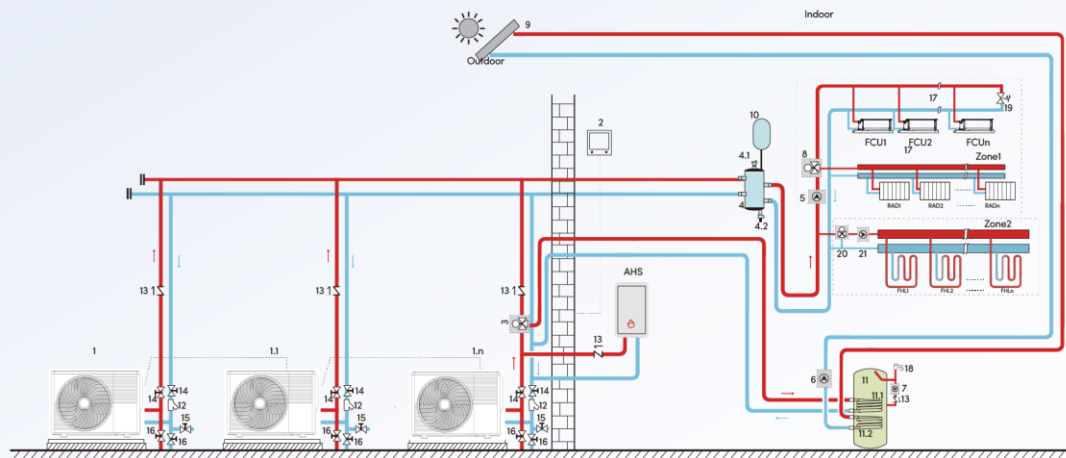
Double Zone



No.	Definition	Remark
1	ThermaX heat pump	
2	User interface	Assessory
3	SV1: DHW switch valve (3-way)	Field supply
4	Buffer tank	Field supply
4.1	Automatic air purge valve	
4.2	Drainage valve	
5	P_C1: Circulation pump for zone1	Field supply
6	P_C3: Circulation pump for solar panel	Field supply
7	P_C4: Circulation pump for DHW	Field supply
8	SV3: Heating/cooling switch valve (3-way)	Field supply
9	Solar panel	Field supply
10	Expansion vessel	Field supply
11	Domestic hot water tank	Field supply
11.1	Coil 1: heat exchanger for heat pump	
11.2	Coil 2: heat exchanger for solar thermal	
12	Y-shape filter	Assessory
13	Check valve	Field supply
14	Shut-off valve	Field supply
15	Water filling valve	Field supply
16	Drainage valve	Field supply
17	Water collector/distributor	Field supply
18	Hot water tap	Field supply
19	Bypass valve	Field supply
20	SV2: Mixing valve (floating-point)	Field supply
21	P_C2: Circulation pump for zone2	Field supply
AHS	Auxiliary heat source	Field supply
FHL	Floor heating loop	Field supply
FCU	Fan coil unit	Field supply
RAD	Radiator	Field supply

Typical Application

Cascade system



No.	Definition	Remark
1	ThermaX heat pump	
2	User interface	Assessory
3	SV1: DHW switch valve (3-way)	Field supply
4	Buffer tank	Field supply
4.1	Automatic air purge valve	
4.2	Drainage valve	
5	P_C1: Circulation pump for zone1	Field supply
6	P_C3: Circulation pump for solar panel	Field supply
7	P_C4: Circulation pump for DHW	Field supply
8	SV3: Heating/cooling switch valve (3-way)	Field supply
9	Solar panel	Field supply
10	Expansion vessel	Field supply
11	Domestic hot water tank	Field supply
11.1	Coil 1: heat exchanger for heat pump	
11.2	Coil 2: heat exchanger for solar thermal	
12	Y-shape filter	Assessory
13	Check valve	Field supply
14	Shut-off valve	Field supply
15	Water filling valve	Field supply
16	Drainage valve	Field supply
17	Water collector/distributor	Field supply
18	Hot water tap	Field supply
19	Bypass valve	Field supply
20	SV2: Mixing valve (floating-point)	Field supply
21	P_C2: Circulation pump for zone2	Field supply
AHS	Auxiliary heat source	Field supply
FHL	Floor heating loop	Field supply
FCU	Fan coil unit	Field supply
RAD	Radiator	Field supply

03

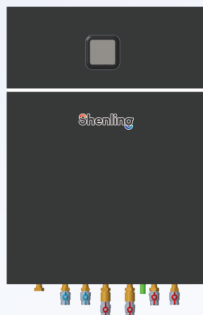
Hydro Series

Product Line-up

ThermaX R290 Mono + Hydro box



9kW 1Ph 12/15kW 3Ph

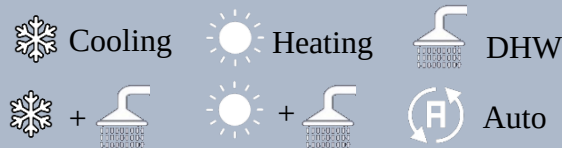


Hydro box

Note: F-gas license is not need*

- Energy label: A+++ at 35°C A++ at 55°C

- Application:



- Min operation ambient temp: -25°C
- Max water outlet temp: 75°C
- 4 inch Touch screen wire controller
- WIFI smart control and IOT&OTA function
- Smart weather curve control
- Smart Grid
- Disinfection



MCS



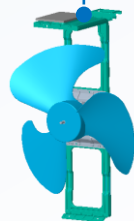
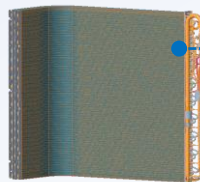
DC Inverter



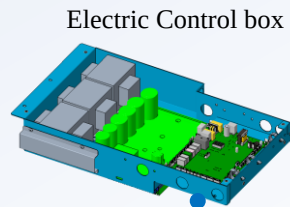
R290 Mono (Hydro Box and Combi Series)



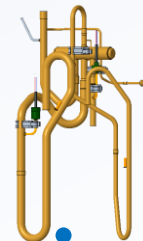
Fin Heat exchanger



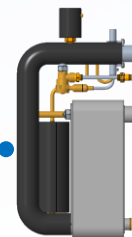
Fan motor part



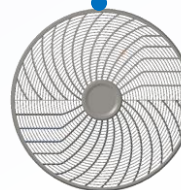
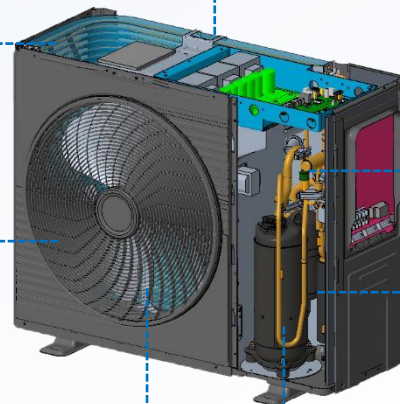
Electric Control box



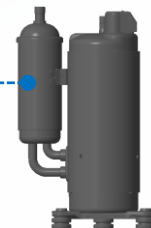
Refrigerant
Circuit



Water Circuit



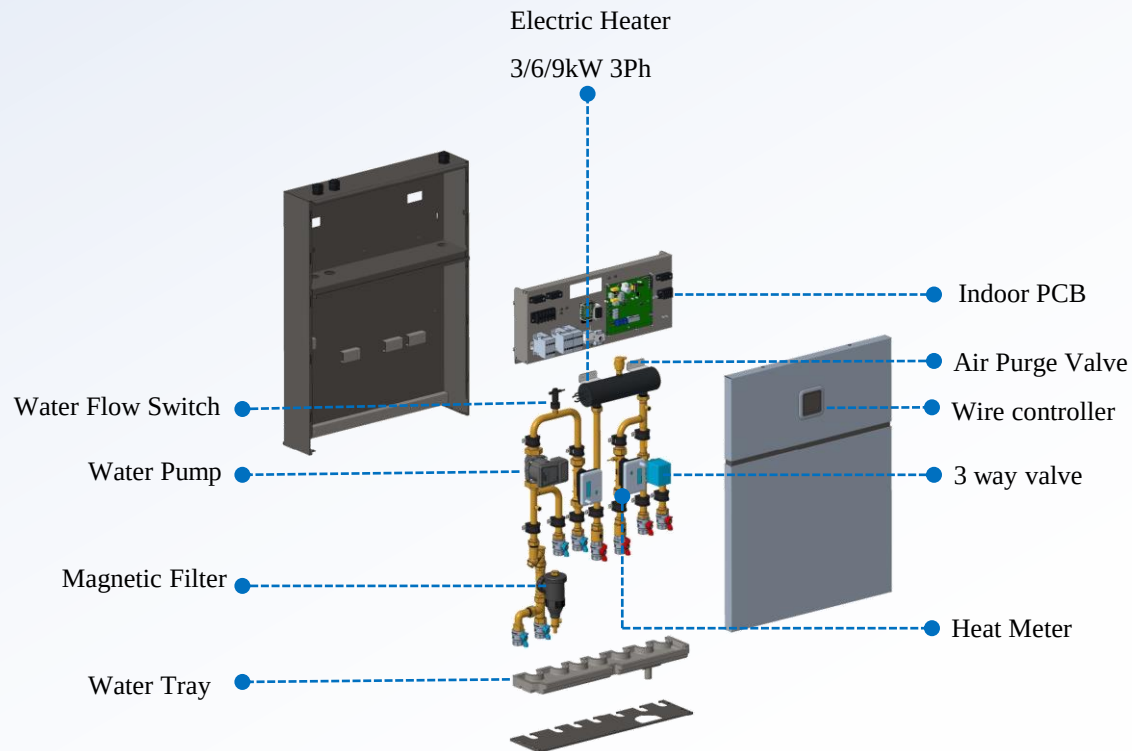
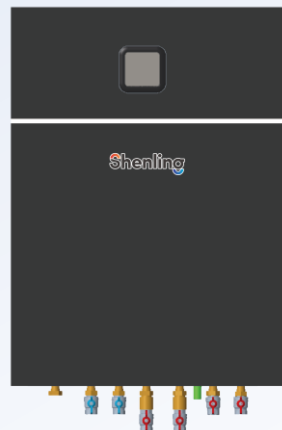
Fan grill



Compressor



Hydro Box



04

Commercial Series

Product Line-up

Polestar R290 Commercial



45kW 3Ph



8inch 209×130×16mm

- Energy label: A+++ at 35°C A++ at 55°C

- Application:



Cooling



Heating



DHW



+



+



Auto

- Min operation ambient temp: -25°C
- Max water outlet temp: 75°C
- 8 inch Touch screen wire controller
- WIFI smart control and IOT&OTA function
- Smart weather curve control
- Room management
- DHW management



Bundesamt
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Ausfuhrkontrolle



MOS

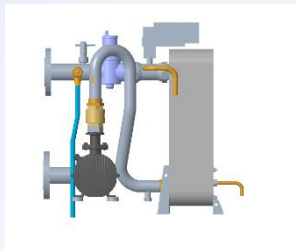


DC Inverter





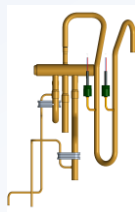
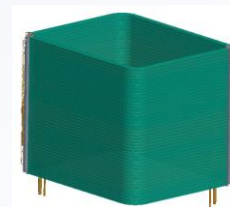
Water circuit part



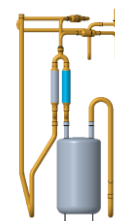
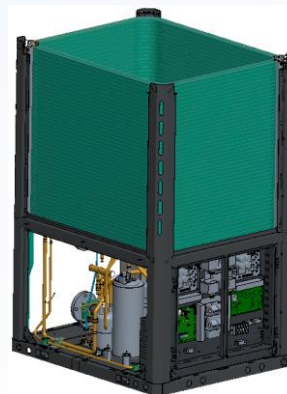
EC fan motor



Fin Heat Exchanger



Refrigerant circuit



Gas-Liquid separator



Reservoir

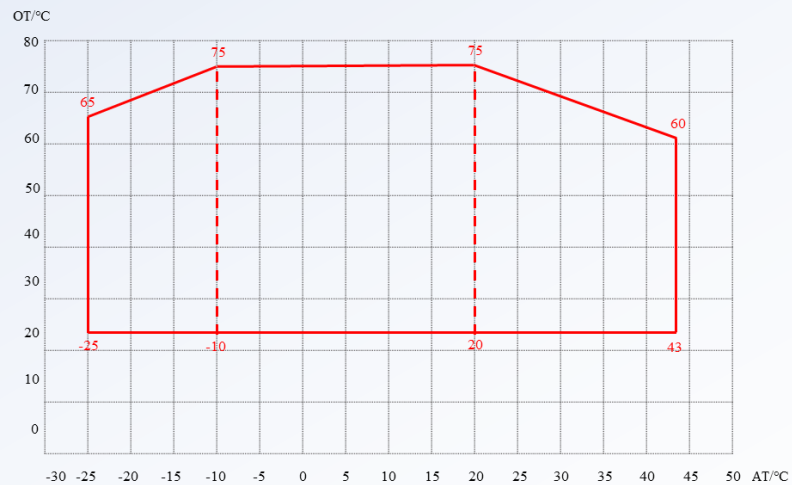


Compressor

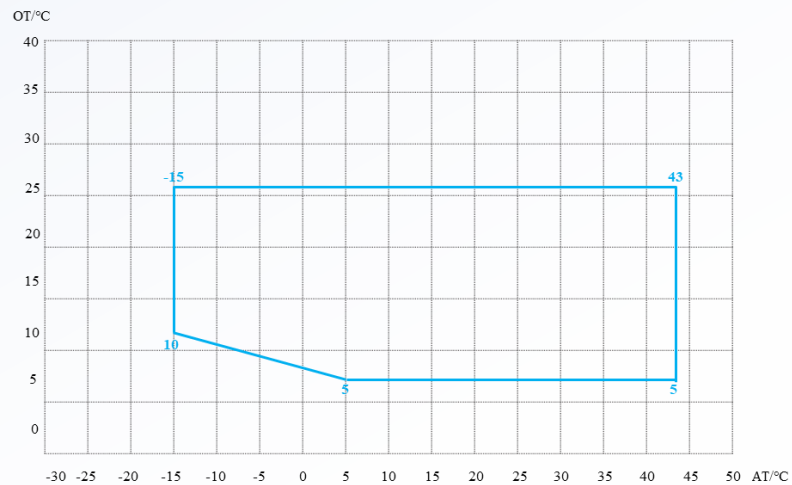


Electric control part

Heating

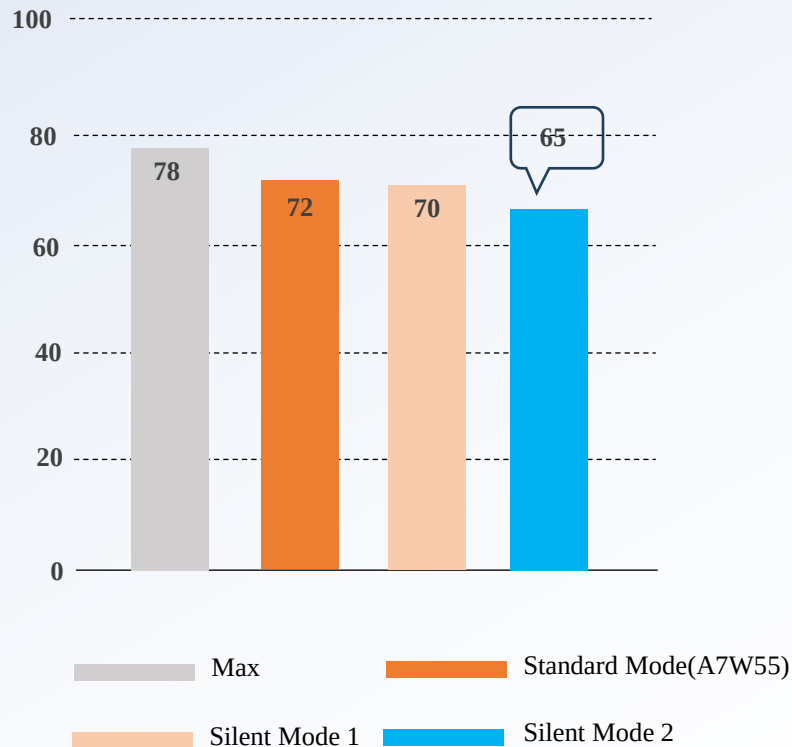


Cooling

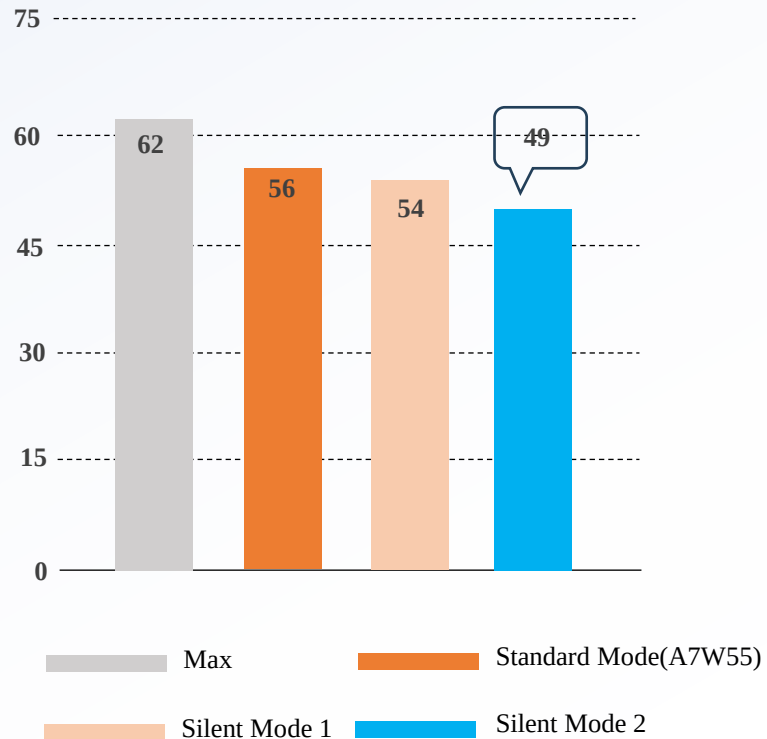


Quite Operation

Sound Power Level dB(A)



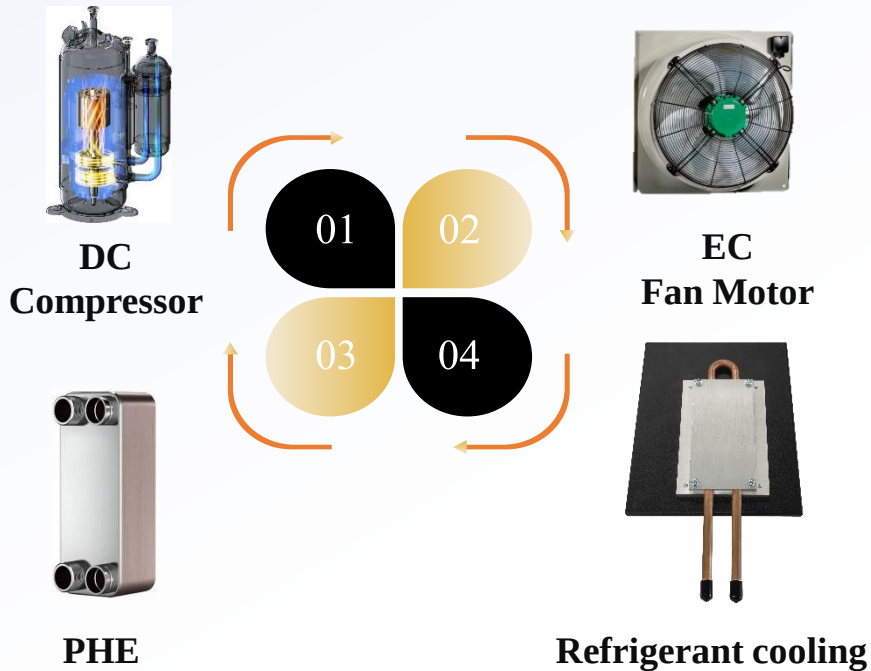
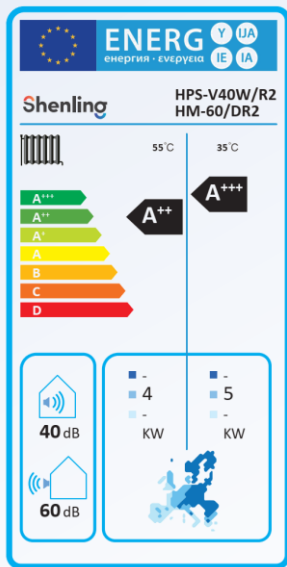
Sound Pressure Level dB 1m



ErP directive

η_s : average up to **A+++** at 35°C

η_s : average up to **A++** at 55°C



Easy Installation

Water Pump

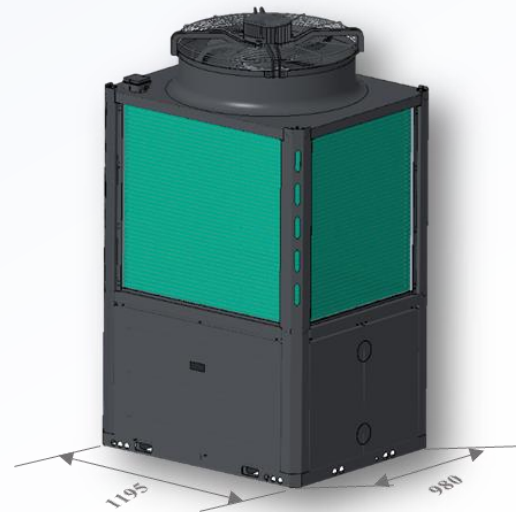
Polestar heat pump equipped with built-in inverter water pump to reduce the installation cost. And also inverter water pump can adjust the water flow precisely.



Note: If no need the built-in inverter pump can connect the fixed speed water pump outside, can customize to remove it.

Covered Area

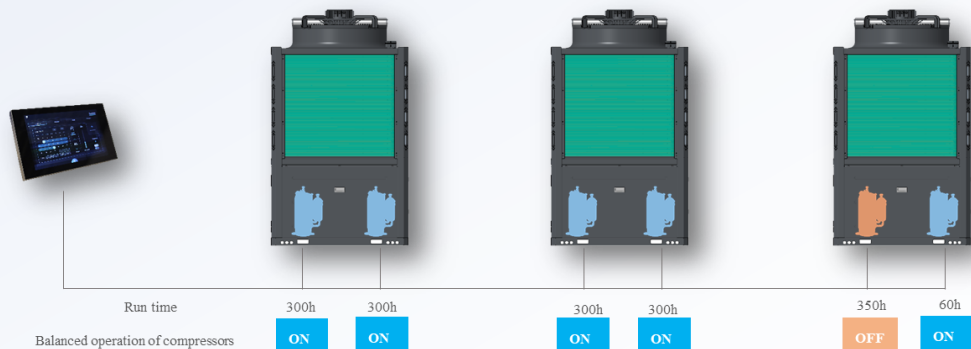
Polestar single heat pump only covered 1.2m² that greatly saves installation space.



High Reliability

Cycle operation

In one combination system, according to the accumulated operation time, all units operates as alternative in cycle, which increases reliability and balances units lifespan.



Backup function

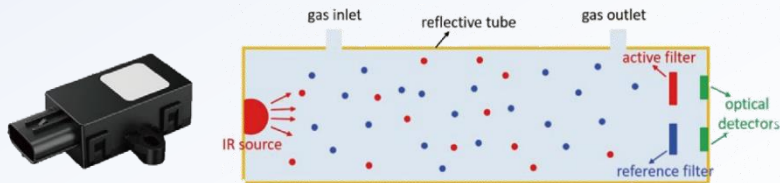
Polestar heat pump have the backup function, even if one of the compressor damaged, another one can still work normally.



Refrigerant leakage detect

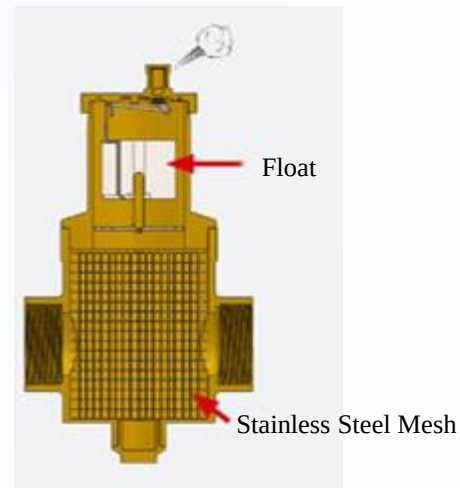
Polestar heat pump equipped with the refrigerant leak sensor. When the system has R290 leakage, the unit will stop to make sure end users safe.

- Smart NDIR gas module
- High sensitivity
- Temperature compensation
- High resolution & Fast response
- Excellent linear output
- Anti-vapor interference



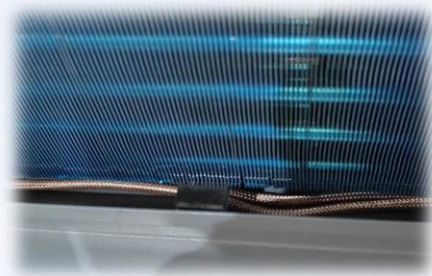
Gas separator

Polestar heat pump equipped with the gas separator that can change the water flow status by the stainless steel mesh to separate the R290 from the water high efficiency when the leakage happen to the plate heat exchanger.

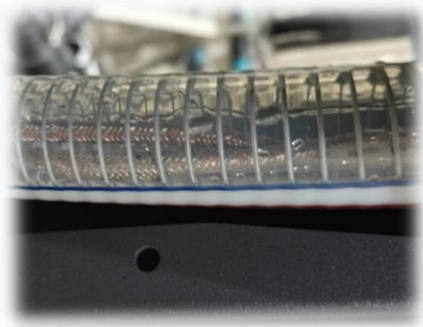


Electric heating

Polestar heat pump have equipped with the electric heating for the water tray and drain pipe to avoid condensate water frozen in winter



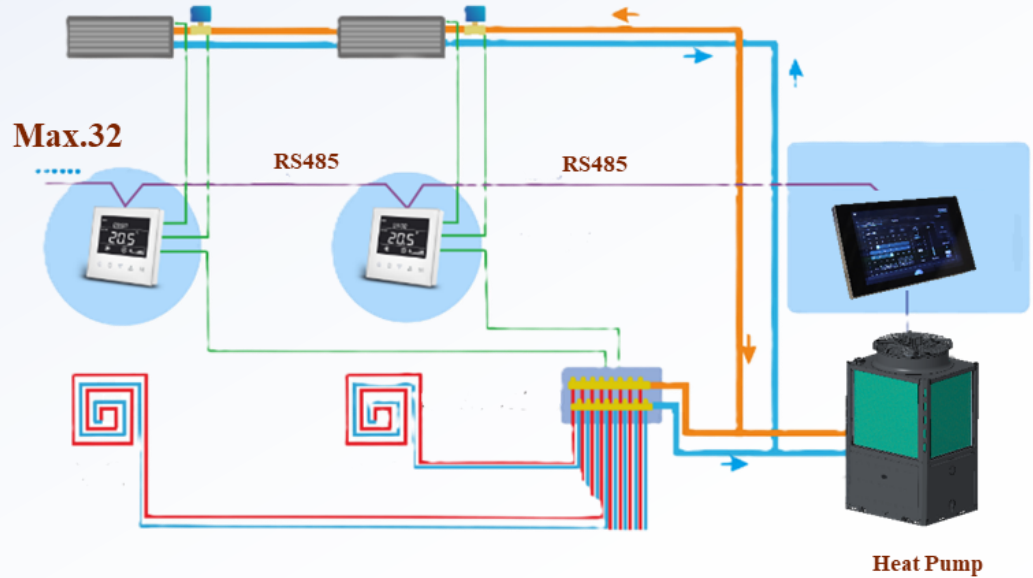
Water tray electric heating

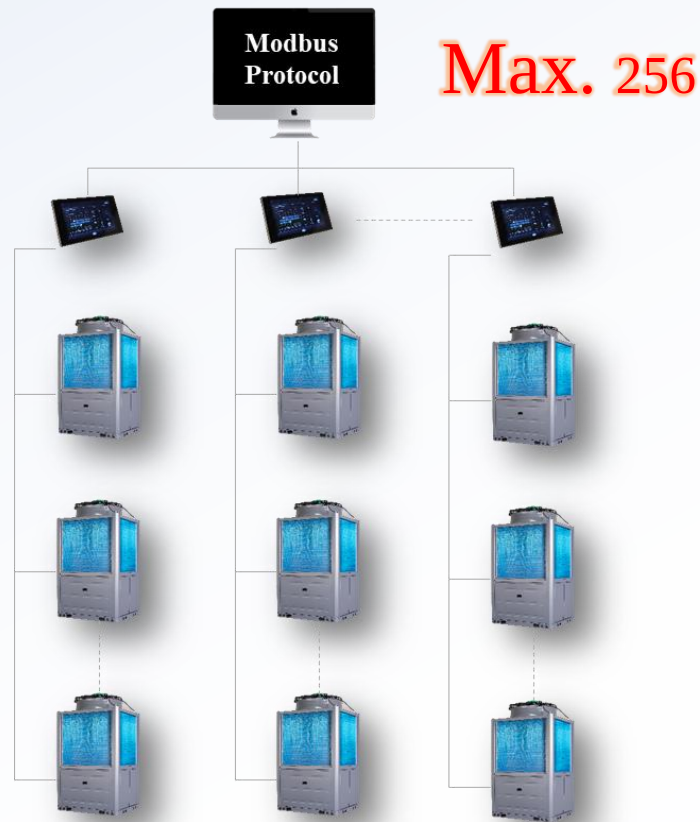


Drain Pipe electric heating

Room Management

- Control max 32 room thermostats
- Group control max 8 zones
- One click button





Note: Max 16 systems, 256 units can be connected with BMS system by Modbus protocol.

Wire Controller



209*130*16mm



- Easy to read and set
- Smart Weather Curve
- weekly/daily schedule
- Silent mode/Eco mode
- Remote monitor
- Fault alarm
- Multi language
- Room management
- Support OTA
- WIFI Function

WIFI Control

1) APP

- Easy to read and set
- Dual temperature zone control
- weekly/daily timer
- Silent mode/holiday
- Remote monitor
- Fault alarm
- Multi language control
- Android & IOS version

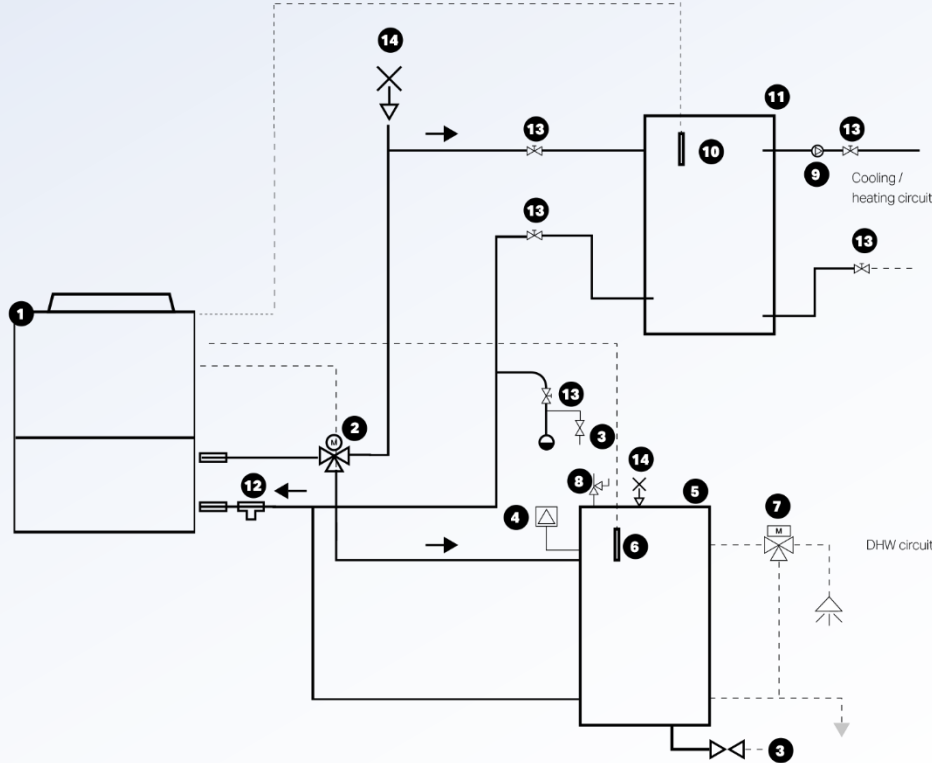
2) Web

- User&Device management
- Remote monitor
- Historical data curve
- Faulty alarm
- OTA remote upgrade(by WIFI or 4G Dtu)



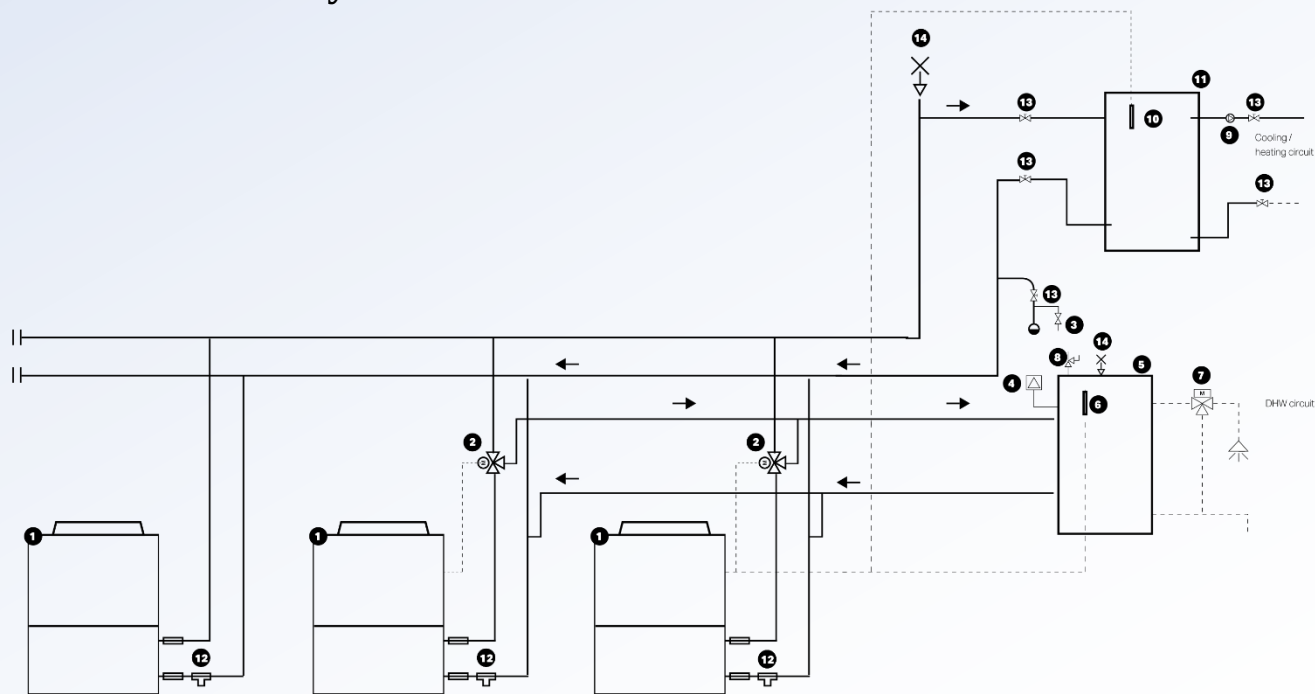
Typical Application

Single Unit



1. Heat Pump
2. 3 way valve
3. Drain Valve
4. Expansion vessel
5. Domestic Hot water tank
6. Domestic Hot water tank sensor
7. Thermostatic valve
8. Safety valve
9. Central heating/cooling water pump
10. Buffer tank sensor
11. Buffer tank
12. Water Filter
13. Shut off valve
14. Vent valve

Cascade system



1. Heat Pump
2. 3 way valve
3. Drain Valve
4. Expansion vessel
5. Domestic Hot water tank
6. Domestic Hot water tank sensor
7. Thermostatic valve
8. Safety valve
9. Central heating/cooling water pump
10. Buffer tank sensor
11. Buffer tank
12. Water Filter
13. Shut off valve
14. Vent valve

Note: The unit qty for DHW production can be set from the wire controller.

THANK YOU

Green the comfort

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