

1H202210



# Heat pump solution



## Midea Building Technologies Division Midea Group

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[mbt.midea.com](http://mbt.midea.com) [www.midea-group.com](http://www.midea-group.com) [tsp.midea.com](http://tsp.midea.com)



Note: Product specifications change from time to time as product improvements and developments are released and may vary from those in this document.

[mbt.midea.com](http://mbt.midea.com)

MAKE A BEAUTIFUL TOMORROW **2023**

# Midea MBT

Midea MBT (Midea Building Technologies) is a key division of the Midea Group, a leading provider of comprehensive solutions of intelligent building, involving energy sources, elevators, control systems, and heating, ventilation & air conditioning. Midea MBT has continued with the tradition of innovation upon which it was founded and emerged as a global leader in the HVAC and building management industry. A strong drive for advancement has resulted in an extensive R&D department that has placed Midea MBT at the forefront of a competitive edge. Through these independent projects and joint-cooperation with other global enterprises, Midea has supplied thousands of innovative solutions to customers worldwide.

3 businesses constitute the significant components of Midea intelligent building solutions



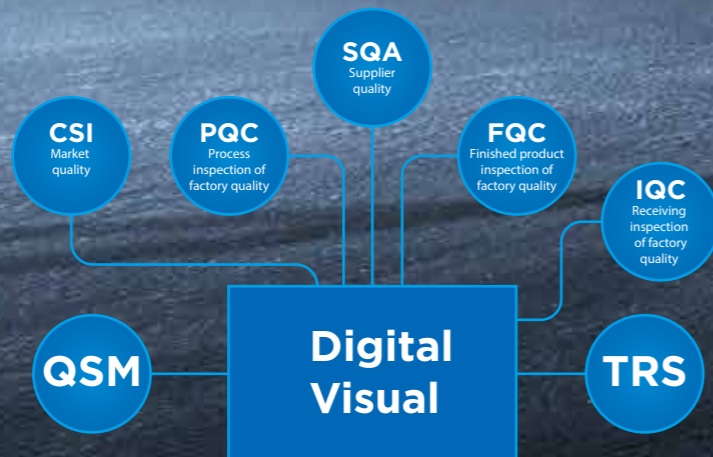
4 production bases can achieve fast delivery



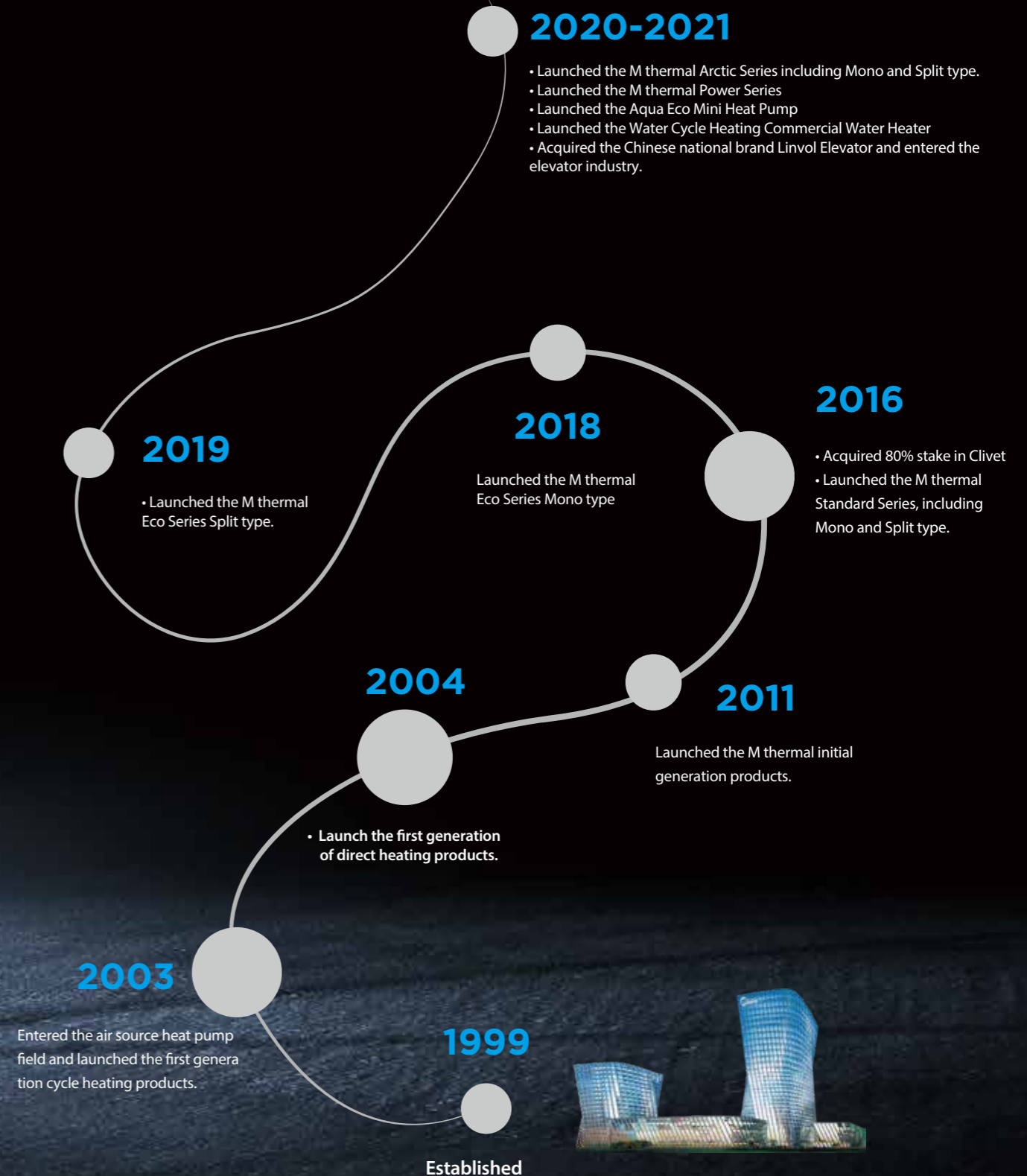
Over 100 testing labs cover all different real application sceneries



All products can be visualized and digitalized throughout entire process



## Heat Pump Solution



## Midea Global Spare Parts Center

The global spare parts center provides high quality and fast spare parts supply. Midea online system (<https://tsp.midea.com>) can query and purchase spare parts with one click, further shortening the supply time of spare parts.

The "2 (HQ Spare parts center) + 10 (Regional Spare parts center) + N (Country Spare parts inventory)" Spare Parts Layout can ensure the timely supply of global after-sales spare parts.



## Mobile Intelligence Service App (MISA)

MISA is the mobile terminal of TSP, with the same functions as TSP. The mobile service makes technical support more timely and convenient.

<https://link.midea.com>



FAQ



Complain



Technical Enquiry

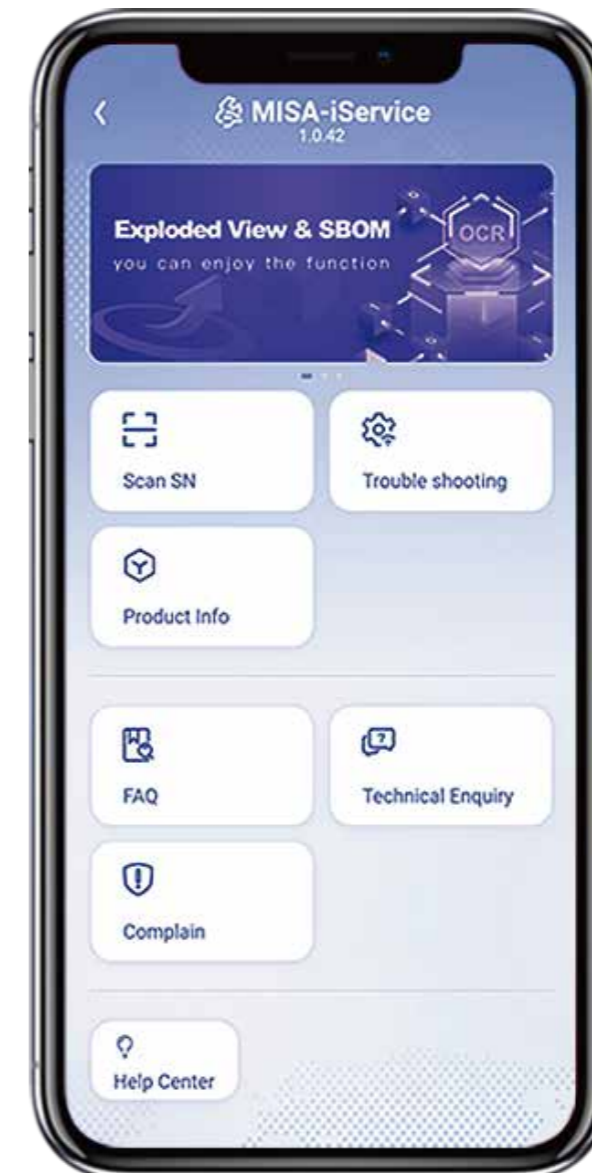


Trouble shooting

Download



Scan above to download the mobile app



Search product manuals



Spare Parts list

Feedback



Thank you very much for your attention and advice

## Technical Support Platform (TSP)

TSP is a platform for customers to provide professional technical support. Through TSP, you can inquire product information, documentation, spare parts and troubleshooting, initiate technical questions and quality complaint process, and also support self-service spare parts order.

Website address: <https://tsp.midea.com/>



### My order

Inquire spare parts from exploded view and place spare parts order directly in TSP.

### Document inquiry and download

View or download product technical documentation online, such as catalogs, images, training PPTs, etc.

### Technical inquiry & FAQ

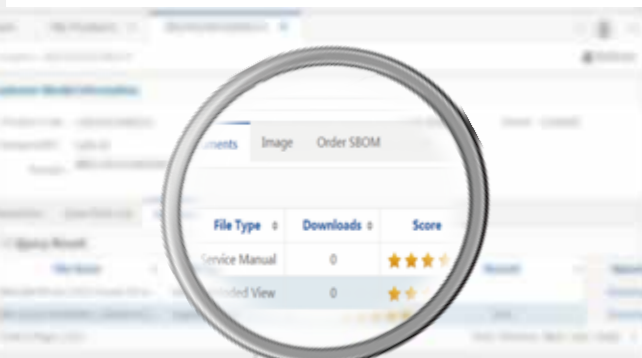
Initiate technical questions online, and our technicians answer them online in time. Find a quick solution in the FAQ.

### Troubleshooting

Query the error code and solution by SN, model name, error code or product type.

### Complain

Initiate the product quality complaint process online, and our after-sales engineers handle related complaints in time.





# MBT Learning Academy

## Objective

MBT Learning Academy aims to provide training to the sales personnel as well as technical personnel in order to increase the utilization for your MBT equipment. Once you have purchased equipment from MBT, taking care of the equipment is topmost priority. MBT Learning Academy offers training courses to learn firsthand from the manufacturer what it takes to get the best out of your MBT product. The goal of MBT Learning Academy is to provide product specific training, safe work procedures and expertise in carrying out the installation and maintenance of MBT products as well as teaching the main selling points in order to help the sales people sell the MBT products with ease.

## Training Centers

Our world class training centers provide knowledge and skills necessary to efficiently deploy MBT technologies. The training centers include dedicated laboratories to 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. Right now we operate our trainings from the below two locations:

### 1. MBT Training Center

**Address:** MBT Training Center, 2nd Floor, Building 6, Midea Global Innovation Center, Beijiao, Shunde, Foshan, China Pin-528311

The Midea MBT Training Center is situated 70 kilometers from Baiyun Guangzhou International Airport.

**Products:** VRF, M thermal

### 2. Chongqing Midea Training Center

**Address:** No. 15, Qiangwei Road, Nan'an District, Chongqing, China

Chongqing Midea Training Center is 35 kilometers from Chongqing International Airport.

**Products:** Centrifugal Chiller, Screw/Scroll Chiller and Terminals



VRF training



M thermal training



Chiller training

## Global Technical Trainings

The training courses by MBT Learning Academy are divided into the following two categories with different targeted audiences for each.

**Design and Application Trainings:** The design and application trainings for various products are basically for the sales personnel selling MBT products in order to give them basic understanding about the main features. The trainings are conducted on a global level inviting sales engineers, technical engineers, consultants and project designers from different parts of the world.

**After Sales- Service Trainings:** These trainings are dedicated for the After Sales/ Service personnel in order for them to better carry out the installation, commissioning and maintenance of MBT products. Technical person and engineers from different parts of the world are invited to take part in these trainings.

**Online Trainings:** The trainings to the Global customers can also be done online with the help of Team and Midea Meeting software. This way, the customers do not need to be physically present for the training. Amid the COVID-19 pandemic, MBT Learning Academy has conducted a lot of online trainings. The training videos are available on the TSP system and can be downloaded by using QR codes.

**Products:** VRF, M thermal, Chillers and Terminals

**Highly Skilled Trainers:** The trainers for various courses by MBT Learning Academy are expert people with vast experiences in their field. Most of them have a deep insight about the global HVAC market and help the attendees to better understand the MBT products.

**Training Certificates:**

The attendees for Global trainings are provided a training certificate highlighting the courses discussed in the training, signed by Mr. Henry Cheng, General Manager of MBT Overseas Sales Company.

**Registration:**

You can contact your respective Midea contact point to provide you with the complete schedule about the global technical trainings as well as how to register for these trainings.

For further enquiries about the Global Trainings conducted by MBT Learning Academy, please send email at the following email address: [peeyush@midea.com](mailto:peeyush@midea.com)



M thermal Arctic Series



M thermal Eco Series

# Reference projects



### Aston Kuta Bali Hotel (Five Star)

- 📍 Country: Indonesia
- 📍 City: Bali
- 📅 Completion Year: 2010
- 🏠 Unit: ATW heat pump



### Sheraton Bandara Resort Hotel (Five Star)

- 📍 Country: Indonesia
- 📍 City: Jakarta
- 📅 Completion Year: 2011
- 🏠 Unit: ATW heat pump



### Grand Aston Tunjungan (Five Star)

- 📍 Country: Indonesia
- 📍 City: Surabaya
- 📅 Completion Year: 2013
- 🏠 Unit: ATW heat pump



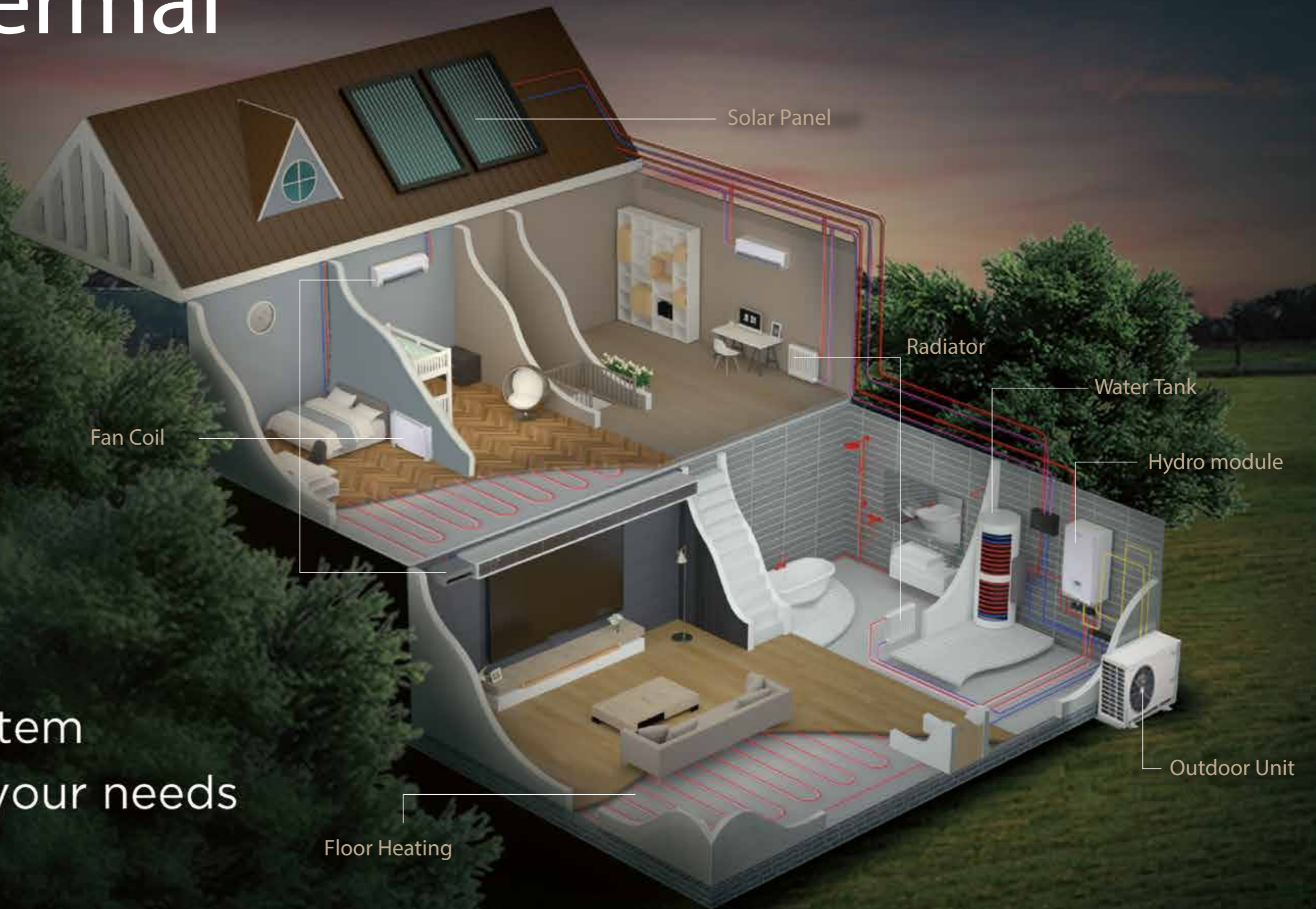
### The Royale Springhill Residences

- 📍 Country: Indonesia
- 📍 City: Jakarta
- 📅 Completion Year: 2010
- 🏠 Unit: ATW heat pump

# Contents

- ▶ 21 M thermal Arctic Series
- ▶ 41 M thermal Power Series
- ▶ 55 Aqua Eco Mini Heat Pump
- ▶ 66 M thermal Accessory(Optional)
- ▶ 67 Water Cycle Heating Commercial Water Heater
- ▶ 75 Direct Heating Commercial Water Heater

# M thermal



**ONE** system  
for **ALL** your needs



# Why is M thermal?

We are always working on it



## thermal

**2021**  
Power Series



**2020**  
Arctic Series



**2018**  
Eco Series



**2016**  
Standard Series



**2011**  
Initial generation



# What is M thermal?

M thermal is one kind of air source heat pump. It is capable of extracting heat from the surrounding air and transferring this heat indoors for space heating and domestic hot water.



## 1 Stage One

With the temperature of the refrigerant being lower than the ambient temperature, heat passes from the air flowing over the air side heat exchanger to the refrigerant and the refrigerant evaporates.

## 2 Stage Two

When the refrigerant vapor passes through the compressor, refrigerant pressure increases and temperature rises above that of the water in hydronic system.

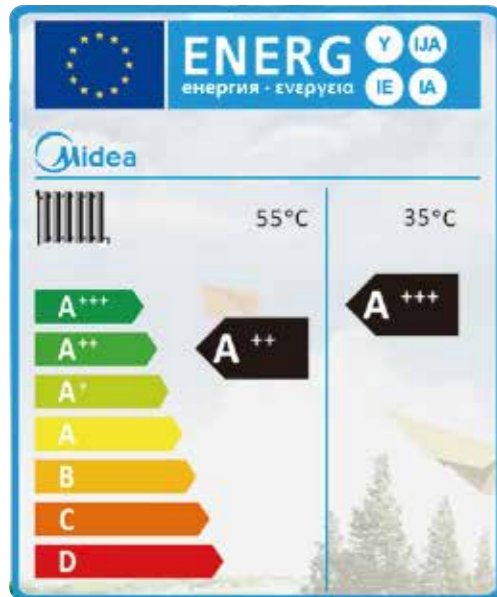
## 3 Stage Three

As the hot vapor refrigerant passes through the water side heat exchanger it heats the water in the hydronic system, which is then pumped indoors to the space heating terminals or hot water tank. The refrigerant cools and condenses and returns to the expansion valve to start the cycle again.

## 4 Stage Four

As the refrigerant passes through the expansion valve and expands, its temperature and pressure both drop.

# We are widely recognized



### ERP Directive\*

ηs. Seasonal space heating energy efficiency

ηs average up to **A<sup>+++</sup>** at 35°C

ηs average up to **A<sup>++</sup>** at 55°C

\*It indicates the highest possible grade for M thermal product lineup. For specific grade of different models, please refer to the specifications.



# We are friendly to environment

Eco friendly refrigerant R32  
 Lower GWP 675 (GWP: Global Warming Potential)  
 Zero impact on the ozone layer  
 Less carbon emission

Higher heat transfer coefficient  
 Better performance in poor conditions  
 Less pressure loss  
 No temperature glide

Easier to get  
 Less charged volume  
 Less cost



**R32**

## We are reliable

- ▶ **DC Inverter fan motor**
  - > CE/CCC certification
  - > BLDC fan motor with stepless control
  - > Quiet operation
  - > Low power consumption
  - > 8 poles
  - > Insulation grade E

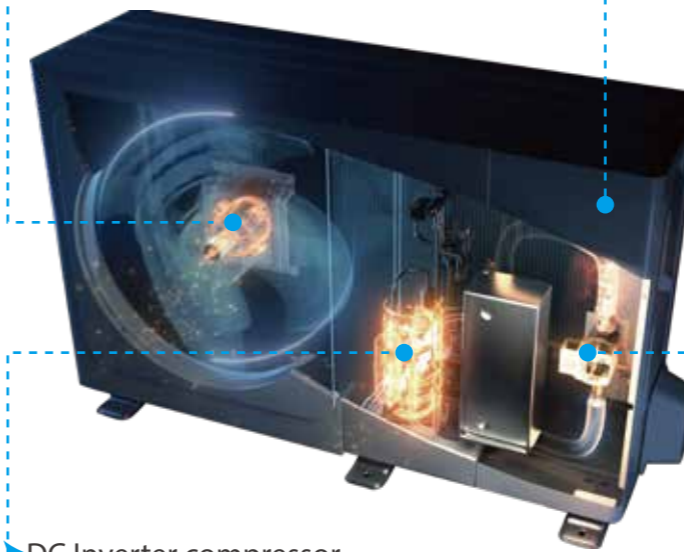
- ▶ **Heat exchanger aluminum foil**
  - > Standard products: 200h of neutral salt mist

- > Heavy anti-corrosion products: 1000h of neutral salt mist  
140h of acid salt mis

### Heat exchanger copper pipe

- > Standard products: 24h of neutral salt mist

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



- ▶ **DC Inverter compressor**
  - > CE certification

- ▶ **Hydraulic components from famous manufactures**
  - > Plate heat exchanger

- > Wide working frequency
  - High efficiency
  - Six poles
  - Insulation grade E

- > Expansion tank

- > Twin eccentric cams
  - 2 balance weights
  - Better balance
  - Low vibration

- > Water pump
  - DC Inverter design\*
  - CE certification
  - High efficiency
  - Big pump head
  - Insulation grade F
  - Level of protection IPX4D

\*For Arctic Series Mono(18~30kW), water pump has three speed options, but units only use one of them.

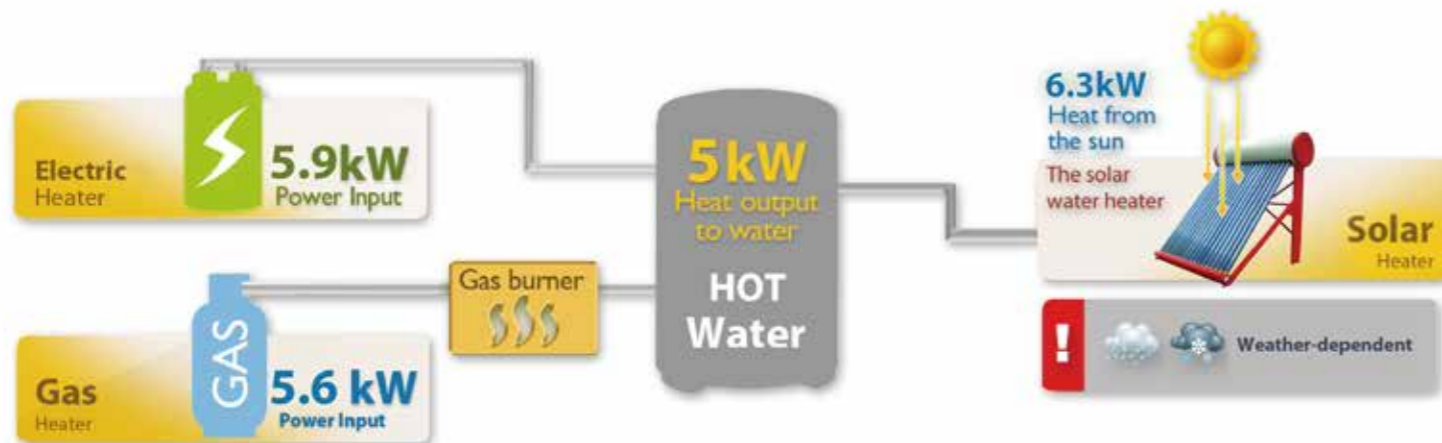
- > Spray liquid cooling control
  - Decrease discharge temperature
  - High reliability

- > Compact structure
  - Highly robust bearings
  - Highly stable moving parts

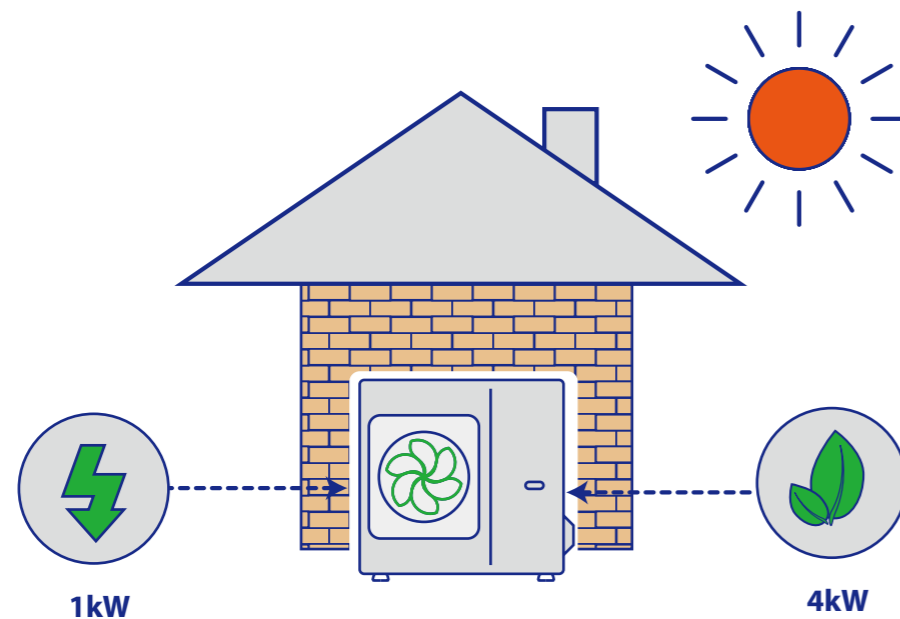
## We are energy efficient



Typically around 4kWh of energy can be captured for every 1kWh of electrical energy expended, giving almost 5kWh of heat energy for only 1kWh of electrical input and giving efficiency of almost 500%.



Note: The data above is just for reference only.

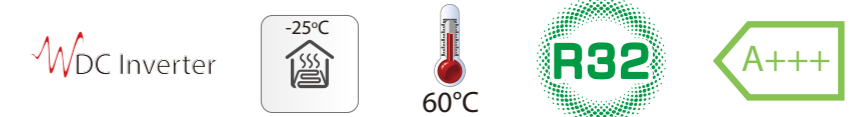


## Product lineup

Mono	Capacity (kW)	4	6	8	10	12	14	16	18	22	26	30
	220~240V-1N-50Hz	●	●	●	●	●	●	●				
	380~415V-3N-50Hz					●	●	●	●	●	●	●
Split Outdoor unit	Capacity (kW)	4	6	8	10	12	14	16				
	220~240V-1N-50Hz	●	●	●	●	●	●	●				
	380~415V-3N-50Hz							●	●	●	●	●
Split Hydronic box	Model	60			100			160				
	220~240V-1N-50Hz		●			●			●			
Split Hydronic Integrated Tank	Volume(L)	190				240						
	220~240V-1N-50Hz			●				●				

### Overview

Refrigerant R32 75% less impact on global warming  
 DC Inverter technology allows precise consumption on real load  
 Maximum water temperature up to 65°C by heat pump  
 Minimum operation ambient temperature down to -25°C  
 COP up to 5.20(Split 4/8kW model)  
 High energy efficiency level A+++ for energy saving (Water outlet temperature at 35°C)  
 Offers heating capacity of 100% at -7°C(Water outlet temperature at 35°C; Mono/Split 4kW model)  
 Provide space heating, cooling and domestic hot water, total heat solution  
 Compatible with other heat sources such as solar panels and boilers



### Compatible with different kinds of terminals

Fan coil unit



Radiator



Water tank



Floor heating loop



Split 4~16kW



Mono 4~30kW



## M thermal Arctic Series

## Focus on your comfort



## High reliability

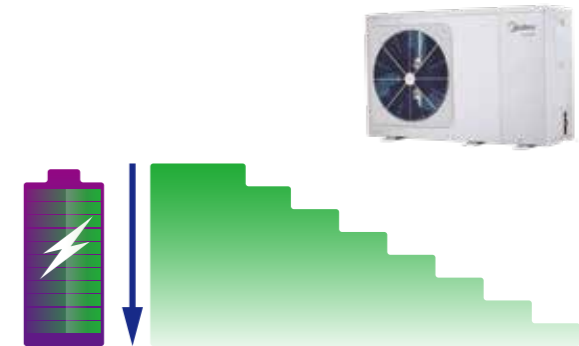
### Preheating and drying up for floor

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even ruptured during floor heating operation. We provide drying up mode which is used after the initial installation of floor loops and pre-heating mode for the first heating during seasonal heating in order to protect the floor. During the process, the water temperature would be increased gradually.



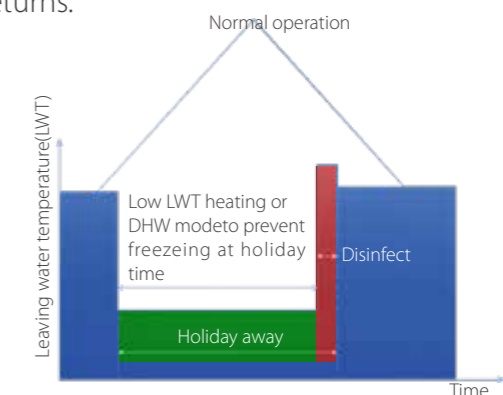
### Power limitation function

Power limitation function makes the machine suitable for a variety of current supplies. There are 8 configurations for user to choose according to the maximum allowable access current. Only easy setting on the wired controller is needed, the units can suit more application.



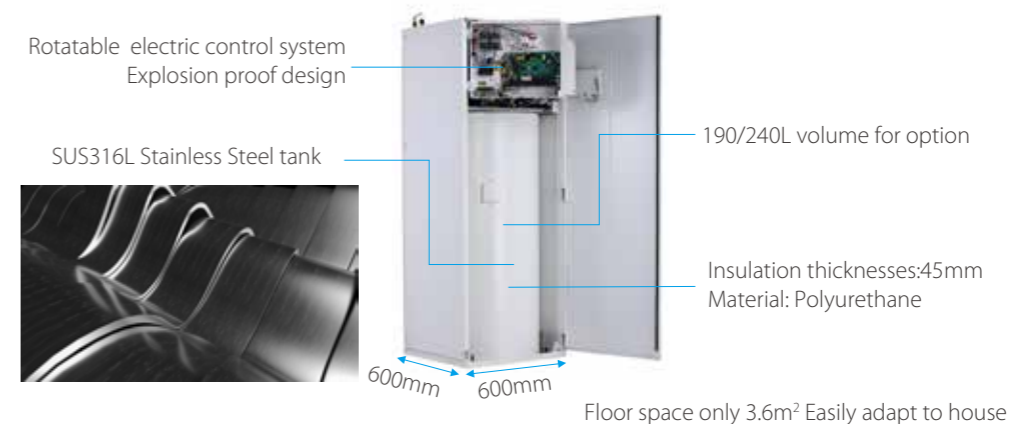
### Holiday away

Holiday away function is a mode for improving system reliability and saving energy. Unit operates in heating mode and/or DHW mode with low water temperature to prevent water from freezing in the winter during holiday outside. The user can pre-set, the disinfection mode before he returns home to make sure that germ free water is available to be used when he returns.



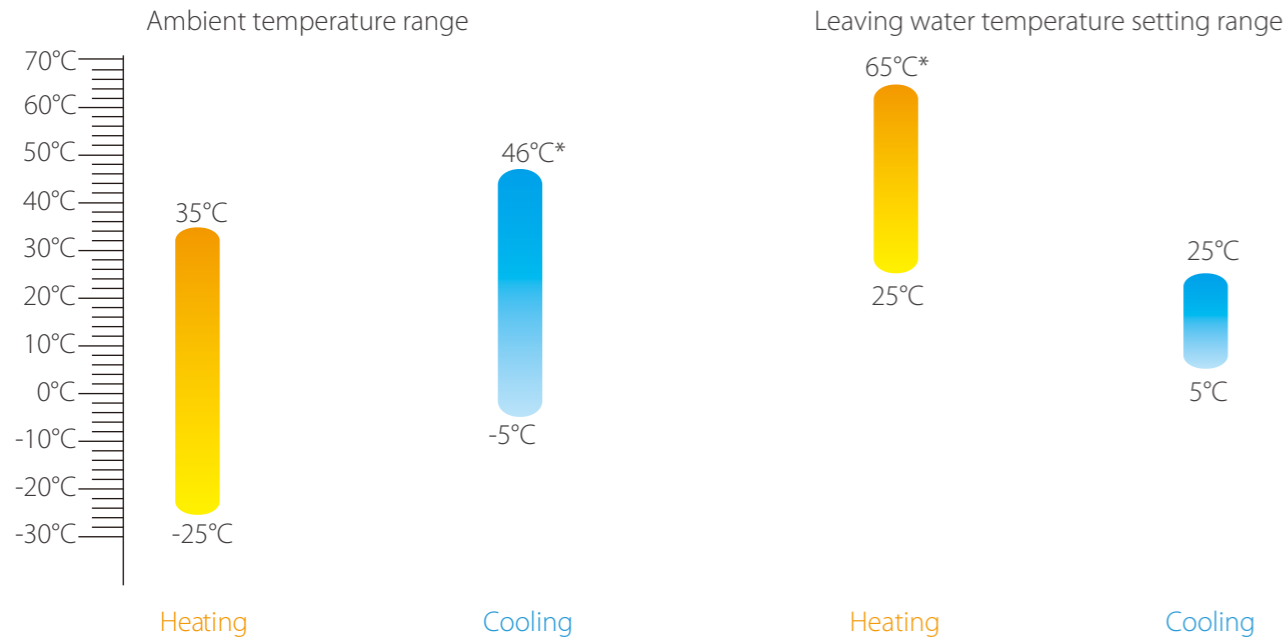
### Safety

The water tank is made of SUS316L stainless steel with excellent corrosion resistance to ensure long-term stable operation of the system. Rotatable electric control box with explosion proof design improves electric safety and maintenance convenience.



Floor space only 3.6m<sup>2</sup> Easily adapt to house

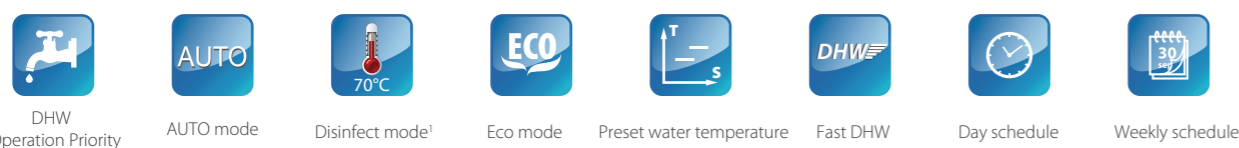
## Wide operation range



\* For Mono 4~16kW and Split models, the ambient temperature range for cooling mode is -5°C~43°C.  
For Mono 18~30kW models, the leaving water setting temperature range for heating mode is 25°C~60°C.



## Mlultiple function

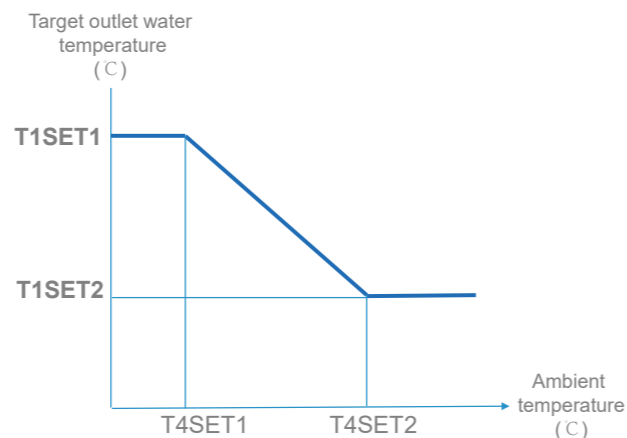


Note:  
1. Only when the immersion heater of tank is available can the disinfection water temperature reaches 70°C.

## Smart control

### Weather temperature curve

With the help of Weather temperature curve function, water temperature will automatically change as outside air temperature changes. When outdoor air temperature increases/decreases, the heating load will decrease/increase and water temperature will decrease/increase automatically. When outdoor air temperature decreases/increases, the cooling load will decrease/increase and water temperature will increase/decrease automatically. Totally 32 fixed Weather temperature curve and one custom curve is available, which meets the diversified requirements of temperature.

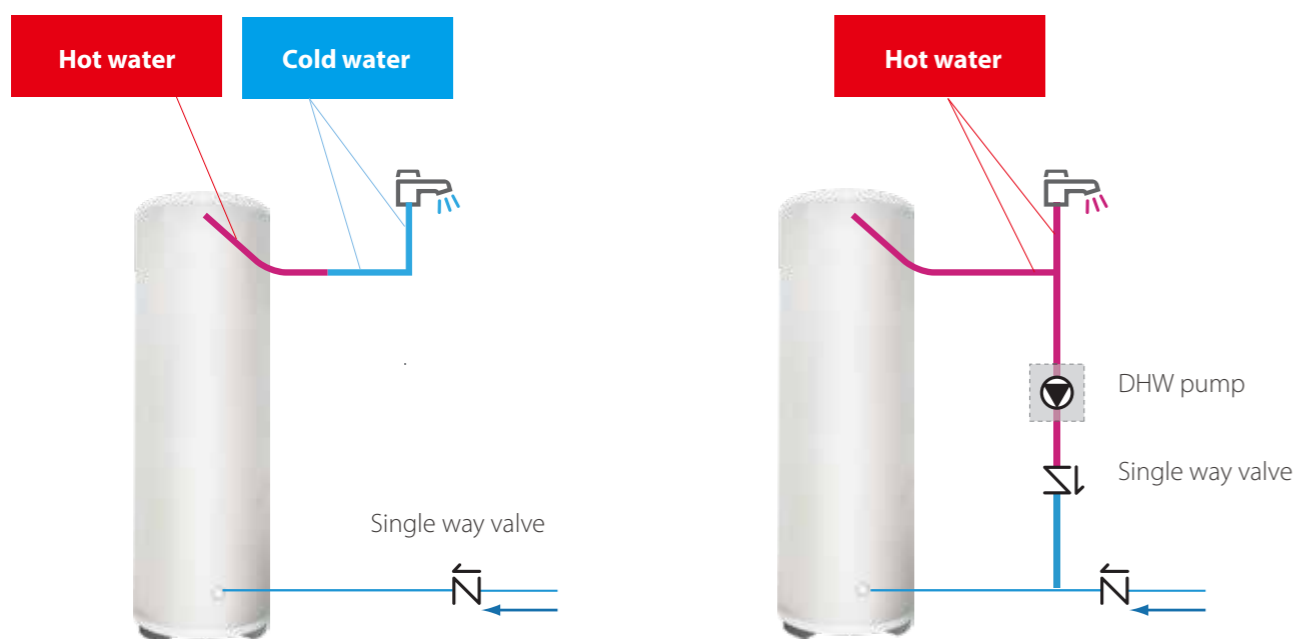


### Smart Grid

Heat pump adjusts the operation mode according to different electrical signals from the grid to realize energy saving. When the electric price is low or even free, heat pump takes DHW priority. When electric price is high, DHW related functions are limited. When the electric price is normal, heat pump operates according to users' requirement.

### DHW pump function

The DHW pump function is used to return water in the water pipe net to the hot water tank according to set timer. Total 12 timers for one day can be set, which allows users to set the DHW pump operation time according to using habit to guarantee using hot water without waiting for a long time.



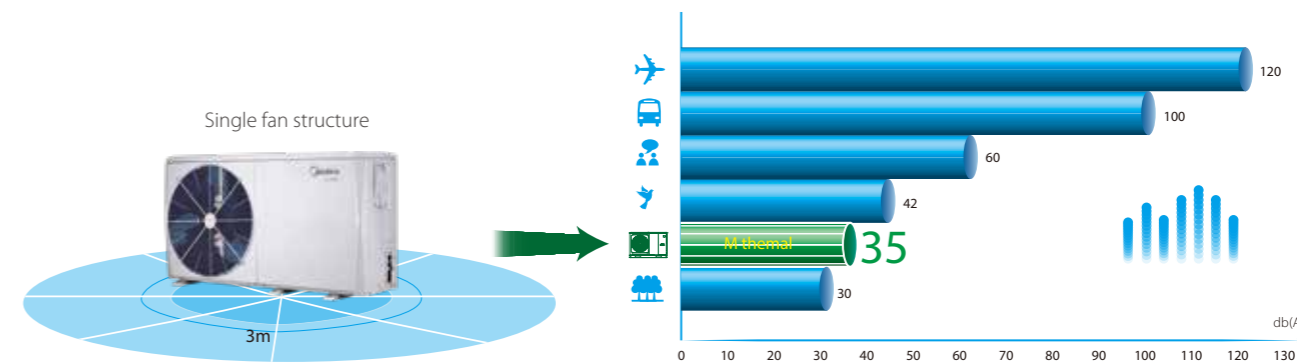
## Comfort

### Silent mode

Mono 4kW model produces 35dB(A) sound pressure level at 3 meters thanks to multiple optimization design.

Test condition:

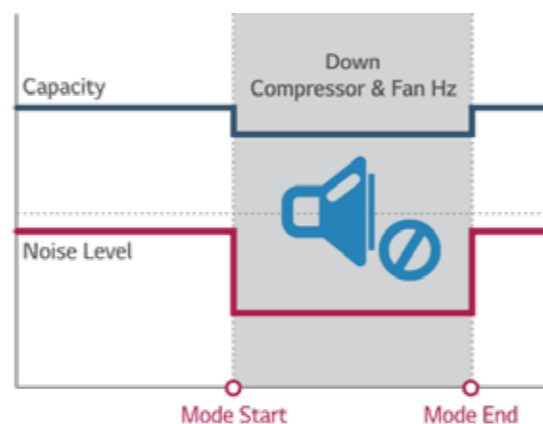
1. Outdoor air temperature 7 °C DB, 6 °C WB; Water inlet 30 °C , Water outlet 35 °C .
2. Outdoor air temperature 35 °C DB; Water inlet 23 °C , Water outlet 18 °C .



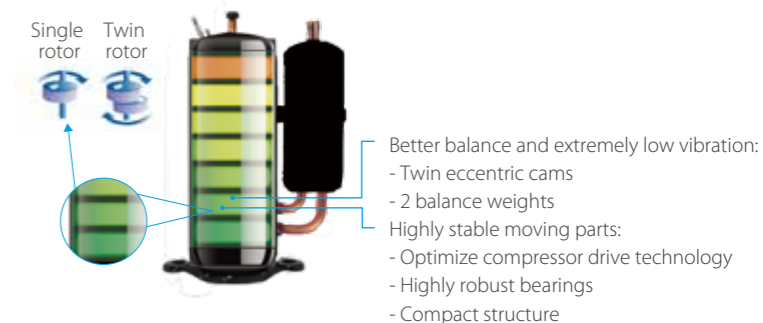
Multiple optimization design makes noise reduction:

### Triple noise reduction

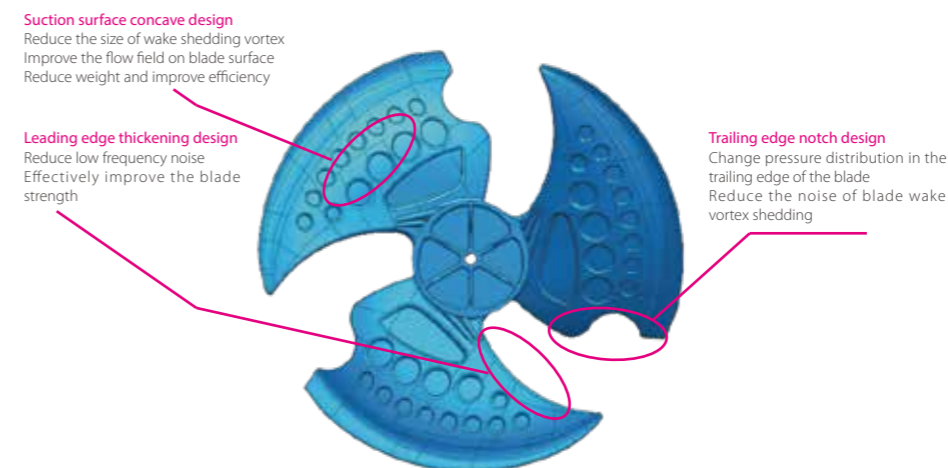
Silent mode decrease the sound effectively Level 2 is more silent than level 1.



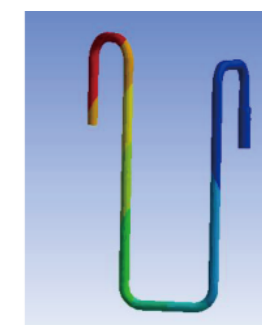
### Twin rotary compressor



### Bionic fan design



### Optimized piping distribution



# Convenient

## USB function

Convenient program upgrade

No need to carry any other heavy equipments but only USB can realize program upgrade of indoor unit and outdoor unit.

Parameter setting transmission between wired controllers

Installer can quickly copy the setting from one controller to another via USB, which save the time of on-site installation.

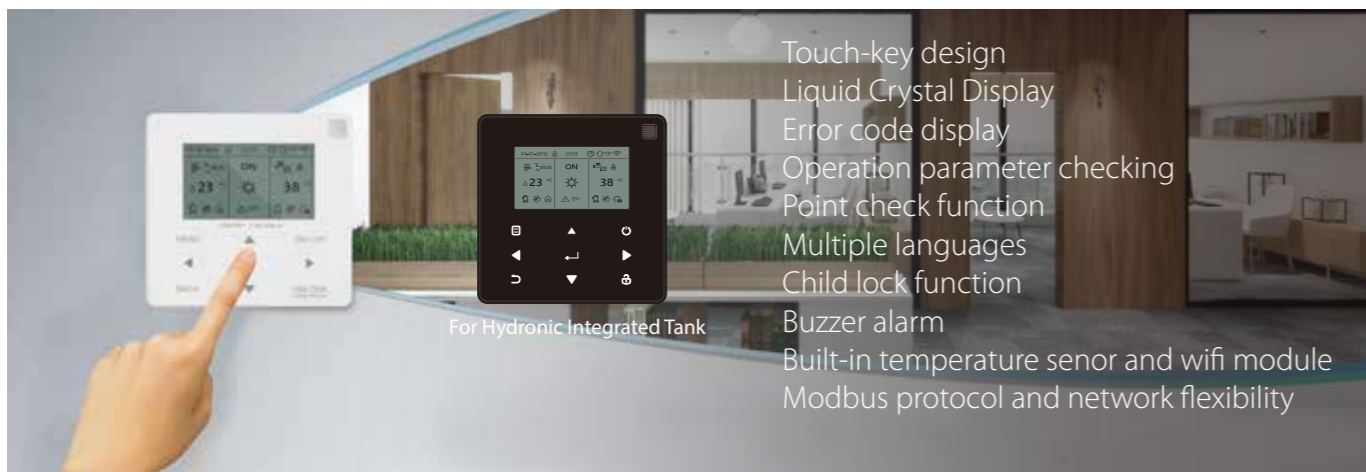


## Holiday home

Holiday home function is used to deviate from the normal schedules without having to change them during the holiday at home.



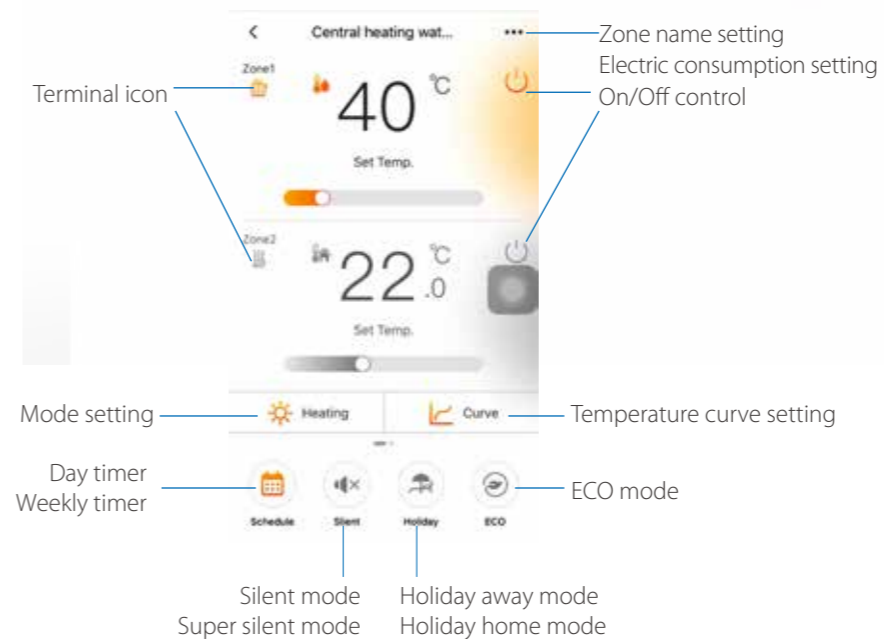
## Wifi controller



For Hydronic Integrated Tank

- Touch-key design
- Liquid Crystal Display
- Error code display
- Operation parameter checking
- Point check function
- Multiple languages
- Child lock function
- Buzzer alarm
- Built-in temperature sensor and wifi module
- Modbus protocol and network flexibility

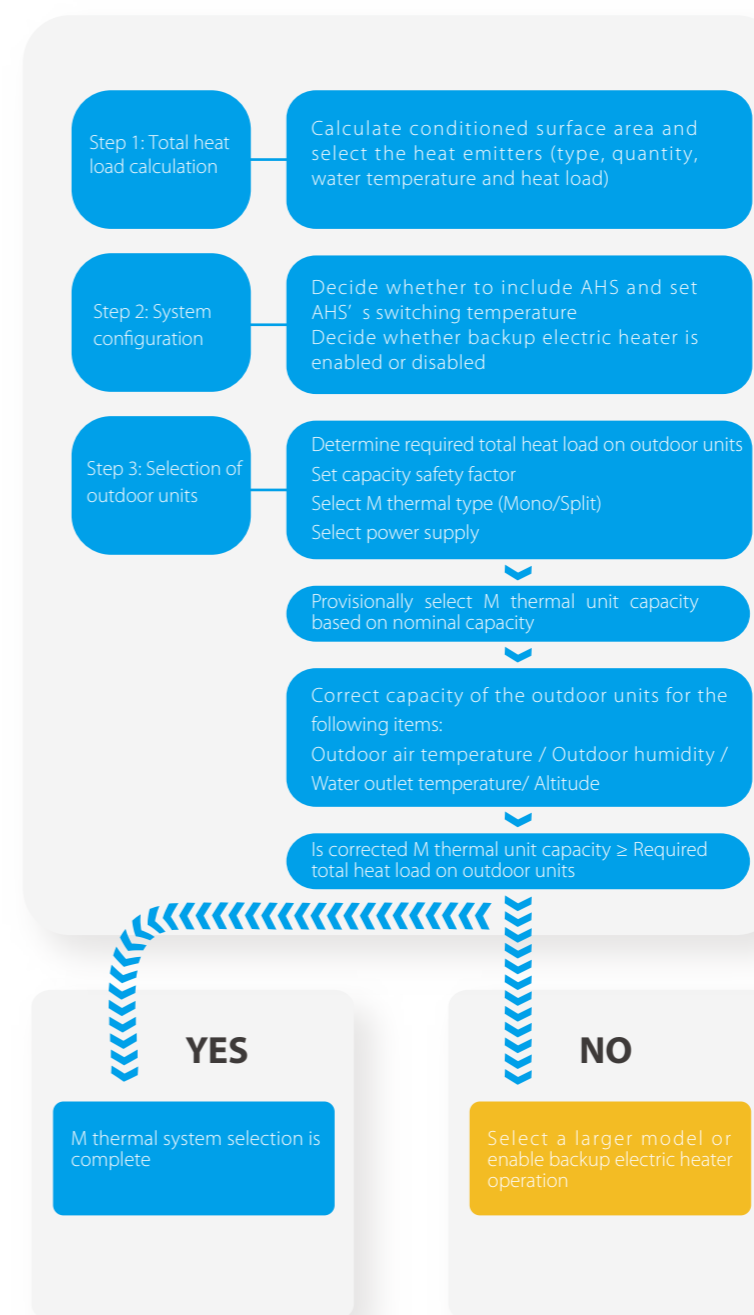
## APP control



- Easy setting
- Double zones control
- Monitor system status
- Know power consumption
- Convenient remote control
- Suggestion for energy saving
- Schedule function and timer setting

Note: APP interface changes from time to time as APP is updated and may change slightly vary from those in this document.

## Selection Procedure



## Leaving Water Temperature (LWT)

The recommended design LWT ranges for different types of heat emitter are:

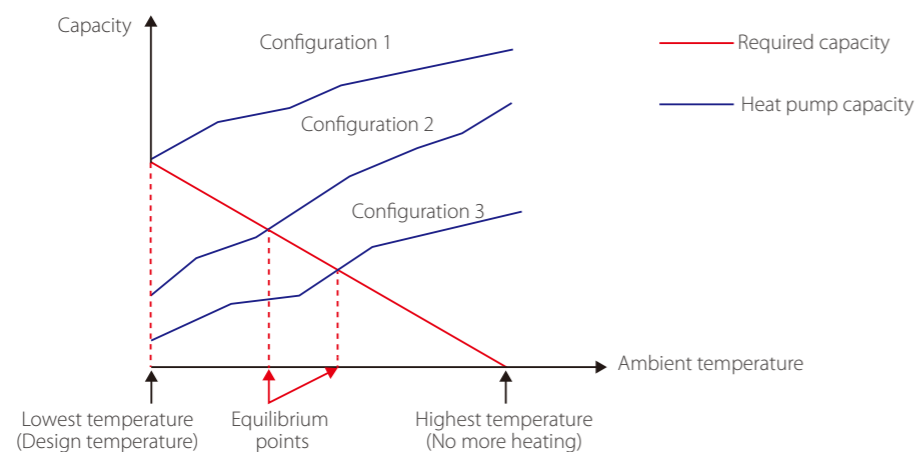
- ❖ For floor heating: 30°C to 35°C
- ❖ For fan coil units: 40°C to 45°C
- ❖ For low temperature radiators: 40°C to 50°C

# Typical Applications

## System configurations

M thermal system can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.



### Configuration 1: Heat pump only

- ❖ The heat pump covers the required capacity and no extra heating capacity is necessary.
- ❖ Requires selection of larger capacity heat pump and implies higher initial investment.
- ❖ Ideal for new construction in projects where energy efficiency is paramount.

### Configuration 2: Heat pump and backup electric heater

- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- ❖ Best balance between initial investment and running costs, results in lowest lifecycle cost.
- ❖ Ideal for new construction.

### Configuration 3: Heat pump with auxiliary heat source

- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- ❖ Enables selection of lower capacity heat pump.
- ❖ Ideal for refurbishments and upgrades.



## One-stop solution - Heating, cooling and domestic hot water in one system

M thermal is an integrated system that provides space heating and cooling as well as domestic hot water, offering a complete, all-year-round solution which can remove the need for traditional gas or oil boilers, or work together with them. M thermal can be combined with floor heating loops, fan coil units, radiators and domestic water tank. It can also be connected to solar collectors, gas furnace, boiler and other heat sources.



Smart Grid certification indicates M thermal can fully utilize electricity from different sources or different price levels, which means like photovoltaic, and the peak valley of urban electricity supply to satisfy different modes operation, which is benefit for cost saving.

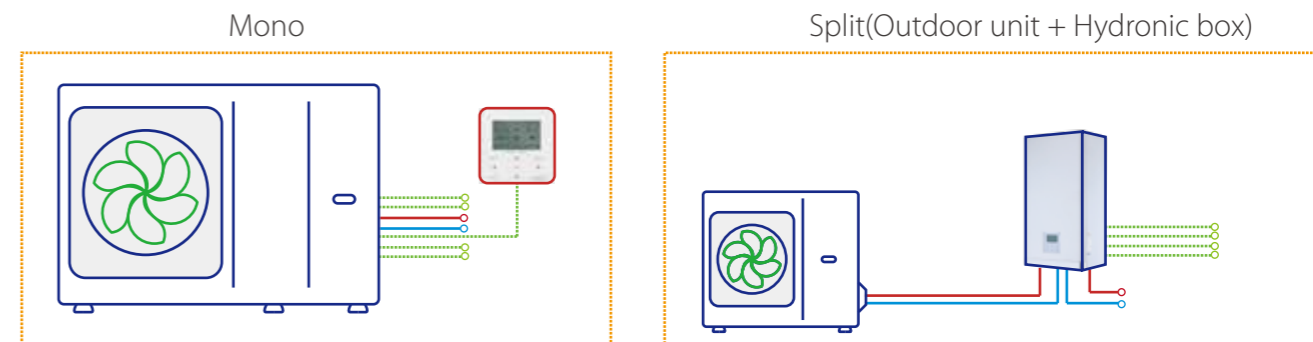


M thermal Mono outdoor unit



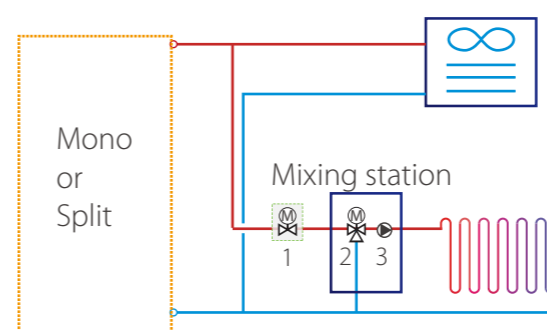
## Typical application

Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.



## Heating and cooling

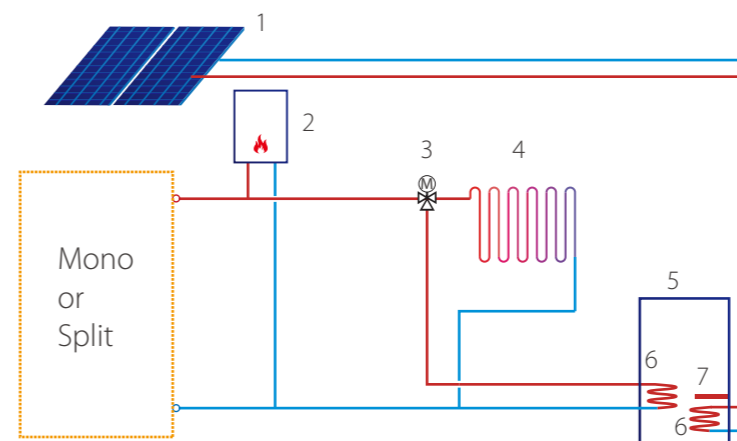
Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. To achieve these two temperature, a mixing station(field supplied) which consists of 3-way valve and water pump is used to adapt the water temperature according to requirements of the floor heating loops. The mixing station is controlled by the unit. For cooling mode, 2-way valve is used to prevent cool water from entering floor heating loops then result in condensation during cooling.



- Notes:
1. 2-way valve(field supplied)
  2. 3-way valve(field supplied)
  3. Water pump(field supplied)
  4. Fan coil unit(Midea can supply)
  5. Floor heating loop(field supplied)

## Heating, DHW and hybrid heat source

Backup electric heater(customized)\* and AHS provide additional heating to raise the water temperature for unit outlet temperature. TBH and solar system provide additional heating to raise the domestic hot water temperature. 3-way valve is used to switch between heating mode and DHW mode.



- Notes:
1. Solar panel(field supplied)
  2. AHS: Additional heating source(field supplied)
  3. 3-way valve(field supplied)
  4. Floor heating loop(field supplied)
  5. Water tank(field supplied)
  6. Heat exchanger coil(field supplied)
  7. TBH: Tank booster heater(field supplied)

\* For Split model, backup electric heater can be installed in the hydraulic box. For Mono 4~16kW models, backup electric heater can be installed in the unit.

### Double zones control

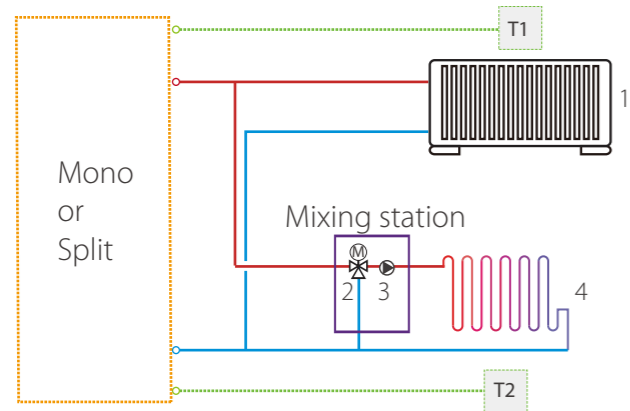
Double zones control is only available for heating mode. It can control different areas to reach different temperature to meet various needs of daily use.

1. Using wired controller only

Wired controller sets the mode, temperature and on/off. Zone 1 is controlled based on the leaving water temperature. Zone 2 is controlled based on the leaving water temperature or built-in sensor integrated in the wired controller.

2. Using wired controller and thermostat

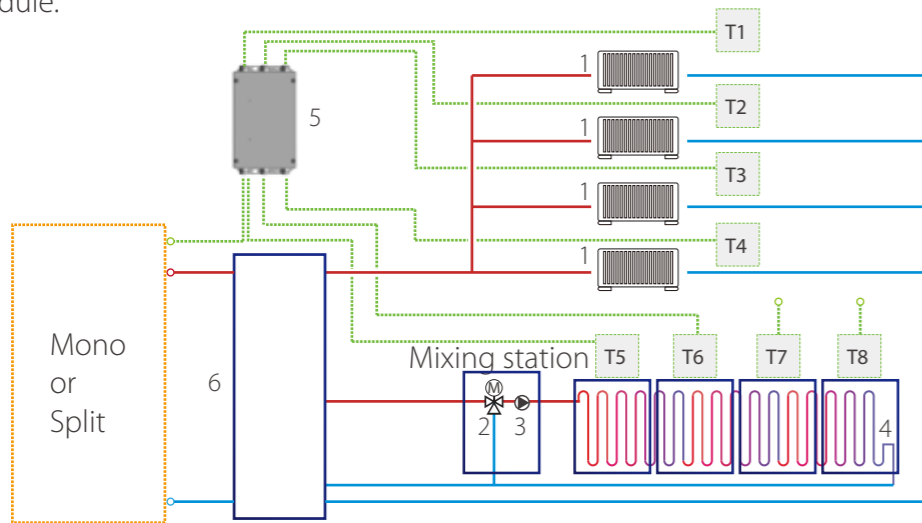
Wired controller sets the mode and water temperature. Both Zone 1 and Zone 2 are controlled by thermostat.



- Notes:
1. Radiator(field supplied)
  2. 3-way valve(field supplied)
  3. Water pump(field supplied)
  4. Floor heating loop(field supplied)
- Abbreviation  
T: Room thermostat(field supplied)

### Multiple rooms control

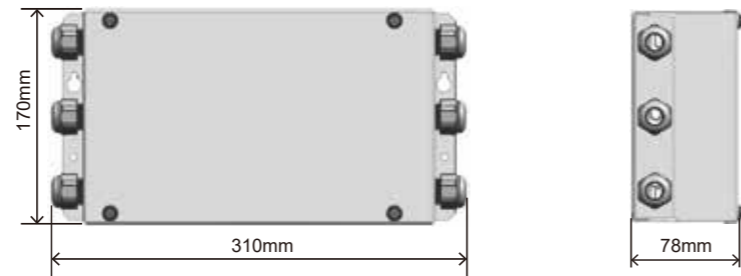
Maximum 6 room thermostats are available to be connected with M-kit and 2 thermostats are connected to hydraulic box, which realizes maximum 8 rooms can be controlled. M-kit is connected to the hydraulic module.



- Notes:
1. Radiator(field supplied)
  2. 3-way valve(field supplied)
  3. Water pump(field supplied)
  4. Floor heating loop
  5. M-kit(customized)
  6. Balance tank(field supplied)
- Abbreviation  
T: Room thermostat(field supplied)

### M-kit

- Wall-mounted
- Simple structure
- Mini size
- Flexible installation
- Connect up to maximum 6 thermostats

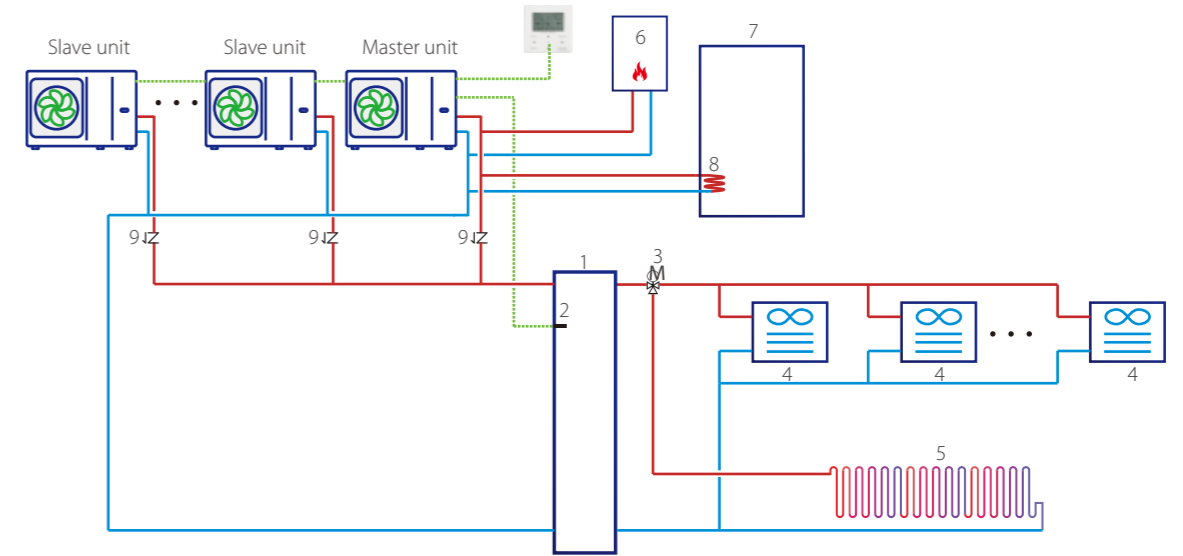


### Cascade system\*

Cascade system design is perfect when an extension of capacity becomes required as the building cooling/heating demand evolves. Maximum 6 units can be controlled in group with one controller. Balance tank temperature control makes water temperature more accurate.

Water tank can only be connected to the master unit water circuit through a three-way valve, and controlled by the master unit.

AHS can only be connected to the master waterway and controlled by the master unit.

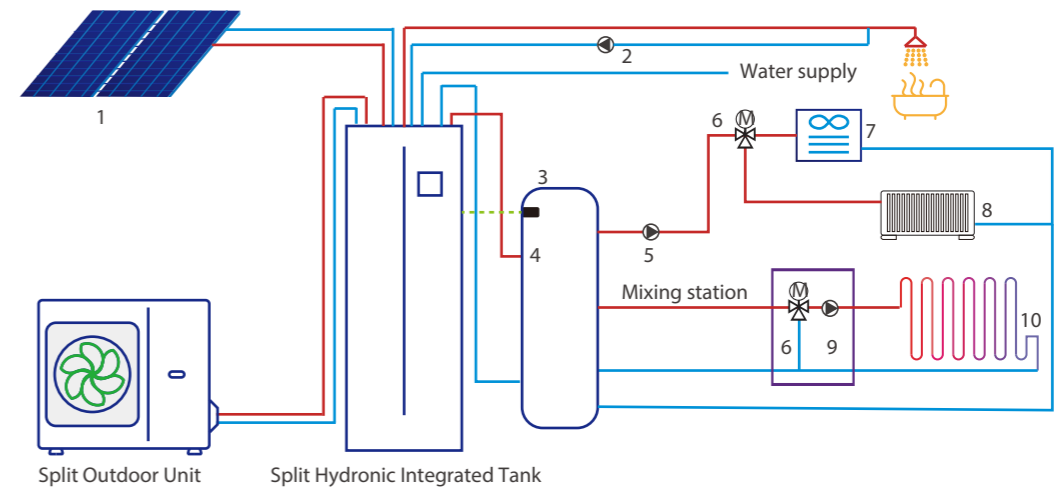


- Notes:
1. Balance tank(field supplied)
  2. Balance tank temperature sensor(Midea can supply)
  3. 3-way valve(field supplied)
  4. Fan coil unit(Midea can supply)
  5. Floor heating loop(field supplied)
  - 6.AHS: Additional heating source(field supplied)
  - 7.Water tank(field supplied)
  - 8.Heat exchanger coil(field supplied)
  - 9.Single way valve (field supplied)

\* 1. 4~16kW modes can only combine with each other to reach a larger system capacity from 4~96kW.  
2. 18~30kW models can only combine with each other to reach a larger system capacity from 18~180kW.

### Split(Outdoor unit + Hydronic Integrated tank)

The stainless water tank and 3-way valve that is used to change the water flow direction between heating mode and DHW mode are integrated design inside the Hydronic Integrated Tank indoor unit, which greatly save the installation and commissioning cost on site.



- Notes:
1. Solar panel (field supplied)
  2. DWH Circulation pump (field supplied)
  3. Balance tank (field supplied)
  4. Balance tank temperature pump (Midea can supply)
  5. Zone 1 circulation pump (field supplied)
  6. 3-way valve (field supplied)
  7. Fan coil unit (Midea can supply)
  8. Radiator (field supplied)
  9. Zone 2 circulation pump (field supplied)
  10. Floor heating loop (field supplied)

## Arctic Series Mono



Outdoor unit model			MHC-V4W/D2N8-B	MHC-V6W/D2N8-B	MHC-V8W/D2N8-B	MHC-V10W/D2N8-B	MHC-V12W/D2N8-B	MHC-V14W/D2N8-B	MHC-V16W/D2N8-B	MHC-V12W/D2RN8-B	MHC-V14W/D2RN8-B	MHC-V16W/D2RN8-B		
Power supply			220-240/1/50						380-415/3/50					
Heating <sup>1</sup>	Capacity	kW	4.20	6.35	8.40	10.0	12.1	14.5	15.9	12.1	14.5	15.9		
	Rated input	kW	0.82	1.28	1.63	2.02	2.44	3.15	3.53	2.44	3.15	3.53		
	COP		5.10	4.95	5.15	4.95	4.95	4.60	4.50	4.95	4.60	4.50		
Heating <sup>2</sup>	Capacity	kW	4.30	6.30	8.10	10.0	12.3	14.1	16.0	12.3	14.1	16.0		
	Rated input	kW	1.13	1.70	2.10	2.67	3.32	3.92	4.57	3.32	3.92	4.57		
	COP		3.80	3.70	3.85	3.75	3.70	3.60	3.50	3.70	3.60	3.50		
Heating <sup>3</sup>	Capacity	kW	4.40	6.00	7.50	9.50	11.9	13.8	16.0	11.9	13.8	16.0		
	Rated input	kW	1.49	2.03	2.36	3.06	3.90	4.68	5.61	3.90	4.68	5.61		
	COP		2.95	2.95	3.18	3.10	3.05	2.95	2.85	3.05	2.95	2.85		
Cooling <sup>4</sup>	Capacity	kW	4.50	6.50	8.30	9.90	12.00	13.50	14.90	12.00	13.50	14.90		
	Rated input	kW	0.82	1.35	1.64	2.18	3.04	3.74	4.38	3.04	3.74	4.38		
	EER		5.50	4.80	5.05	4.55	3.95	3.61	3.40	3.95	3.61	3.40		
Cooling <sup>5</sup>	Capacity	kW	4.70	7.00	7.45	8.20	11.5	12.4	14.0	11.5	12.4	14.0		
	Rated input	kW	1.36	2.33	2.22	2.52	4.18	4.96	5.60	4.18	4.96	5.60		
	EER		3.45	3.00	3.35	3.25	2.75	2.50	2.50	2.75	2.50	2.50		
Seasonal space heating energy efficiency class <sup>6</sup>	Water outlet at 35°C	class	A+++											
	Water outlet at 55°C	class	A++											
Refrigerant	Type(GWP)		R32(675)											
	Charged volume	kg	1.40			1.40			1.75					
Sound power level <sup>7</sup>	dB	55	58	59	60	65	65	68	65	65	65	68		
Net dimension (WxHxD)	mm	1295x718x429			1385x865x526									
Packing dimension (WxHxD)	mm	1375x885x475			1465x1035x560									
Net/Gross weight	kg	86/107			105/132			129/155			144/172			
Water pump	Max. pump head	9												
Water piping connection	mm	R1"			R5/4"									
Ambient temperature range	Cooling	°C	-5~43											
	Heating	°C	-25~35											
	DHW	°C	-25~43											
LWT setting range	Cooling	°C	5~25											
	Heating	°C	25~65											
	DHW	°C	30~60											
Backup E-heater <sup>8</sup>	Standard mounted	kW	/											
	Optional	kW	3	3	3/9	3/9	3/9	3/9	3/9	3/9	3/9	3/9		
	Capacity steps		1	1	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3		
Power supply	3kW	V/Ph/Hz	220-240/1/50											
	9kW		380-415/3/50											

## Notes:

- 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.
  - Backup electric heater is built into all models.
- For three phase type backup electric heater, 3/6kW can be achieved by changing DIP switch when heat pump is equipped with 9kW. In this case, three phase power supply is needed.
9. Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014.

## Arctic Series Mono



Model			MHC-V18W/D2RN8	MHC-V22W/D2RN8	MHC-V26W/D2RN8	MHC-V30W/D2RN8
Power supply		V/Ph/Hz	380-415/3/50			
Heating <sup>1</sup>	Capacity	kW	18.00	22.00	26.00	30.10
	Rated input	kW	3.83	5.00	6.37	7.70
	COP		4.70	4.40	4.08	3.91
Heating <sup>2</sup>	Capacity	kW	18.00	22.00	26.00	30.00
	Rated input	kW	5.14	6.47	8.39	10.35
	COP		3.50	3.40	3.10	2.90
Heating <sup>3</sup>	Capacity	kW	18.00	22.00	26.00	30.00
	Rated input	kW	6.55	8.30	10.61	13.04
	COP		2.75	2.65	2.45	2.30
Cooling <sup>4</sup>	Capacity	kW	18.50	23.00	27.00	31.00
	Rated input	kW	3.90	5.00	6.28	7.75
	EER		4.75	4.60	4.30	4.00
Cooling <sup>5</sup>	Capacity	kW	17.00	21.00	26.00	29.50
	Rated input	kW	5.57	7.12	9.63	11.57
	EER		3.05	2.95	2.70	2.55
Seasonal space heating energy efficiency class <sup>6</sup>	Water outlet at 35°C	class	A+++	A+++	A+++	A++
	Water outlet at 55°C	class	A++	A++	A+	A+
Refrigerant	Type(GWP)		R32(675)			
	Charged volume		5.0			
Sound power level <sup>7</sup>	dB	71	73	75	77	
Net dimension (WxHxD)	mm	1129x1558x440				
Packing dimension (WxHxD)	mm	1220x1735x565				
Net/Gross weight		177/206				
Water pump	Max. pump head	m	12.0	12.0	12.0	12.0
Water piping connection	inch	1-1/4" BSP	1-1/4" BSP	1-1/4" BSP	1-1/4" BSP	
Ambient temperature range	Cooling	°C	-5-46			
	Heating	°C	-25-35			
	DHW	°C	-25-43			
LWT setting range	Cooling	°C	5-25			
	Heating	°C	25-60			
	DHW	°C	30-60			

## Notes:

- 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.
- Testing standard: EN12102-1.
- Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014.

## Arctic Series Split

Outdoor unit model			MHA-V4W/D2N8-B	MHA-V6W/D2N8-B	MHA-V8W/D2N8-B	MHA-V10W/D2N8-B	MHA-V12W/D2N8-B	MHA-V14W/D2N8-B	MHA-V16W/D2N8-B	MHA-V12W/D2RN8-B	MHA-V14W/D2RN8-B	MHA-V16W/D2RN8-B
Hydronic box model			HB-A60/CGN8-B			HB-A100/CGN8-B			HB-A160/CGN8-B			
Heating <sup>1</sup>	Capacity	kW	4.25	6.20	8.30	10.0	12.1	14.5	16.0	12.1	14.5	16.0
	Rated input	kW	0.82	1.24	1.60	2.00	2.44	3.09	3.56	2.44	3.09	3.56
	COP		5.20	5.00	5.20	5.00	4.95	4.70	4.50	4.95	4.70	4.50
Heating <sup>2</sup>	Capacity	kW	4.35	6.35	8.20	10.0	12.3	14.2	16.0	12.3	14.2	16.0
	Rated input	kW	1.14	1.69	2.08	2.63	3.24	3.89	4.44	3.24	3.89	4.44
	COP		3.80	3.75	3.95	3.80	3.80	3.65	3.60	3.80	3.65	3.60
Heating <sup>3</sup>	Capacity	kW	4.40	6.00	7.50	9.50	12.0	13.8	16.0	12.0	13.8	16.0
	Rated input	kW	1.49	2.00	2.36	3.06	3.87	4.60	5.52	3.87	4.60	5.52
	COP		2.95	3.00	3.18	3.10	3.10	3.00	2.90	3.10	3.00	2.90
Cooling <sup>4</sup>	Capacity	kW	4.50	6.55	8.40	10.00	12.00	13.50	14.2	12.00	13.50	14.2
	Rated input	kW	0.81	1.34	1.66	2.08	3.00	3.74	3.93	3.00	3.74	3.93
	EER		5.55	4.90	5.05	4.80	4.00	3.61	3.61	4.00	3.61	3.61
Cooling <sup>5</sup>	Capacity	kW	4.70	7.00	7.40	8.20	11.6	12.7	14.0	11.6	12.7	14.0
	Rated input	kW	1.36	2.33	2.19	2.48	4.22	4.98	5.71	4.22	4.98	5.71
	EER		3.45	3.00	3.38	3.30	2.75	2.55	2.45	2.75	2.55	2.45
Seasonal space heating energy efficiency class <sup>6</sup>	Water outlet at 35°C	class	A+++									
	Water outlet at 55°C	class	A++									
Hydronic box sound power level <sup>7</sup>	dB		38		42						43	

Notes:

1. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 30 C, Water outlet 35 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 47 C, Water outlet 55 C.
4. Outdoor air temperature 35 C DB; Water inlet 23 C, Water outlet 18 C.
5. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
6. Seasonal space heating energy efficiency class testes in average climate general.
7. Testing standard: EN12102-1.
8. Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014.

Outdoor Unit Model			MHA-V4W/D2N8-B	MHA-V6W/D2N8-B	MHA-V8W/D2N8-B	MHA-V10W/D2N8-B	
Hydronic Integrated Tank Model			HBT-A100/190CD30GN8-B				
Domestic hot water	Tapping profile according EN16147		L				
	Water heating energy efficiency class <sup>1</sup>	Average climate	class	A+	A+	A+	A+
			COP	3.10	3.10	3.02	3.02
		Warm climate	class	A+	A+	A+	A+
			COP	3.80	3.80	3.66	3.66
		Cold climate	class	A	A	A	A
COP			2.50	2.50	2.61	2.61	
Heating <sup>1</sup>	Capacity	kW	4.25	6.20	8.30	10.00	
	Rated input	kW	0.82	1.24	1.60	2.00	
	COP		5.20	5.00	5.20	5.00	
Heating <sup>2</sup>	Capacity	kW	4.35	6.35	8.20	10.00	
	Rated input	kW	1.14	1.69	2.08	2.63	
	COP		3.80	3.75	3.95	3.80	
Cooling <sup>1</sup>	Capacity	kW	4.50	6.55	8.40	10.00	
	Rated input	kW	0.81	1.34	1.66	2.08	
	EER		5.55	4.90	5.05	4.80	
Cooling <sup>2</sup>	Capacity	kW	4.70	7.00	7.40	8.20	
	Rated input	kW	1.36	2.33	2.19	2.48	
	EER		3.45	3.00	3.38	3.30	
Space heating	Seasonal space heating energy efficiency class <sup>2</sup>	Water outlet at 35°C	class	A+++	A+++	A+++	A+++
		Water outlet at 55°C	class	A++	A++	A++	A++
Indoor unit sound power Level <sup>4</sup>	dB		38		40		

Notes:

1. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 30 C, Water outlet 35 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Outdoor air temperature 35 C DB; Water inlet 23 C, Water outlet 18 C.
4. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
5. Seasonal space heating energy efficiency class testes in average climate general.
6. Testing standard: EN12102-1.
7. Relevant EU standards and legislation: EN16147; (EU) No 812/2013

Outdoor Unit Model			MHA-V4W/D2N8-B	MHA-V6W/D2N8-B	MHA-V8W/D2N8-B	MHA-V10W/D2N8-B	
Hydronic Integrated Tank Model			HBT-A100/240CD30GN8-B				
Domestic hot water	Tapping profile according EN16147		XL				
	Water heating energy efficiency class <sup>1</sup>	Average climate	class	A+	A+	A+	A+
			COP	3.34	3.34	3.36	3.36
		Warm climate	class	A+	A+	A+	A+
			COP	4.24	4.24	4.18	4.18
		Cold climate	class	A	A	A	A
COP			2.63	2.63	2.72	2.72	
Heating	A7W35 <sup>2</sup>	Capacity	kW	4.25	6.20	8.30	10.00
		Rated input	kW	0.82	1.24	1.60	2.00
		COP		5.20	5.00	5.20	5.00
	A7W45 <sup>3</sup>	Capacity	kW	4.35	6.35	8.20	10.00
		Rated input	kW	1.14	1.69	2.08	2.63
		COP		3.80	3.75	3.95	3.80
Cooling	A35W18 <sup>4</sup>	Capacity	kW	4.50	6.55	8.40	10.00
		Rated input	kW	0.81	1.34	1.66	2.08
		EER		5.55	4.90	5.05	4.80
	A35W7 <sup>5</sup>	Capacity	kW	4.70	7.00	7.40	8.20
		Rated input	kW	1.36	2.33	2.19	2.48
		EER		3.45	3.00	3.38	3.30
Space heating	Seasonal space heating energy efficiency class	Water outlet at 35°C	class	A+++	A+++	A+++	A+++
		Water outlet at 55°C	class	A++	A++	A++	A++
Indoor unit sound power Level <sup>6</sup>	dB		38		40		

Notes:

1. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 30 C, Water outlet 35 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Outdoor air temperature 35 C DB; Water inlet 23 C, Water outlet 18 C.
4. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
5. Seasonal space heating energy efficiency class testes in average climate general.
6. Testing standard: EN12102-1.
7. Relevant EU standards and legislation: EN16147; (EU) No 812/2013

Outdoor Unit Model			MHA-V12W/D2N8-B	MHA-V14W/D2N8-B	MHA-V16W/D2N8-B	MHA-V12W/D2RN8-B	MHA-V14W/D2RN8-B	MHA-V16W/D2RN8-B	
Hydronic Integrated Tank Model			HBT-A160/240CD30GN8-B						
Domestic hot water	Tapping profile according EN16147		XL						
	Water heating energy efficiency class <sup>1</sup>	Average climate	class	A+	A+	A+	A+	A+	
			COP	3.00	3.00	3.00	3.00	3.00	
		Warm climate	class	A+	A+	A+	A+	A+	
			COP	3.73	3.73	3.73	3.73	3.73	
		Cold climate	class	A	A	A	A	A	
COP			2.24	2.24	2.24	2.24	2.24		
Heating	A7W35 <sup>2</sup>	Capacity	kW	12.10	14.50	16.00	12.10	14.50	16.00
		Rated input	kW	2.44	3.09	3.56	2.44	3.09	3.56
		COP		4.95	4.70	4.50	4.95	4.70	4.50
	A7W45 <sup>3</sup>	Capacity	kW	12.30	14.20	16.00	12.30	14.20	16.00
		Rated input	kW	3.24	3.89	4.44	3.24	3.89	4.44
		COP		3.80	3.65	3.60	3.80	3.65	3.60
Cooling	A35W18 <sup>4</sup>	Capacity	kW	12.00	13.50	14.2	12.00	13.50	14.2
		Rated input	kW	3.00	3.74	3.93	3.00	3.74	3.93
		EER		4.00	3.61	3.61	4.00	3.61	3.61
	A35W7 <sup>5</sup>	Capacity	kW	11.60	12.70	14.00	11.60	12.70	14.00
		Rated input	kW	4.22	4.98	5.71	4.22	4.98	5.71
		EER		2.75	2.55	2.45	2.75	2.55	2.45
Space heating	Seasonal space heating energy efficiency class	Water outlet at 35°C	class	A+++	A+++	A+++	A+++	A+++	
		Water outlet at 55°C	class	A++	A++	A++	A++	A++	
Indoor unit sound power Level <sup>6</sup>	dB		42		44		42	44	

Notes:

1. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 30 C, Water outlet 35 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Outdoor air temperature 35 C DB; Water inlet 23 C, Water outlet 18 C.
4. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
5. Seasonal space heating energy efficiency class testes in average climate general.
6. Testing standard: EN12102-1.
7. Relevant EU standards and legislation: EN16147; (EU) No 812/2013

## Arctic Series Split outdoor unit



Outdoor unit model		MHA-V4W/D2N8-B	MHA-V6W/D2N8-B	MHA-V8W/D2N8-B	MHA-V10W/D2N8-B	MHA-V12W/D2N8-B	MHA-V14W/D2N8-B	MHA-V16W/D2N8-B	MHA-V12W/D2RN8-B	MHA-V14W/D2RN8-B	MHA-V16W/D2RN8-B	
Power supply		220-240/1/50						380-415/3/50				
Refrigerant	Type(GWP)	R32(675)										
	Charged volume	1.50		1.65		1.84						
Sound power Level <sup>1</sup>	dB	56	58	59	60	64	65	68	64	65	68	
Net dimension (WxHxD)	mm	1008x712x426			1118x865x523							
Packing dimension (WxHxD)	mm	1065x810x485			1190x970x560							
Net/Gross weight	kg	58/63.5		77/89		97/110.5			112/125.5			
Pipe size O.D.	Liquid	6.35			9.52							
	Gas	15.88			15.88							
Connection method		Flared										
Between indoor and outdoor unit	Height difference	Max.20										
	Pipe length	2-30										
Additional refrigerant	Chargment	20		38								
	Max. pipe length for no additional refrigerant	15										
Ambient temperature range	Cooling	-5~43										
	Heating	-25~35										
	DHW	-25~43										

Note: 1. Testing standard: EN12102-1.

## Arctic Series Split hydronic box



Hydronic box model		HB-A60/CGN8-B	HB-A100/CGN8-B	HB-A160/CGN8-B
Power supply		220-240/1/50		
Unit dimension (WxHxD)		420x790x270		
Packing dimension (WxHxD)		525x1050x360		
Net/Gross weight		37/43	37/43	39/45
Water pump	Max. pump head	9		
	Water side	R1*		
Connection	Refrigerant liquid	6.35	9.52	
	Refrigerant gas	15.88	15.88	
Backup E-heater <sup>2</sup>	Standard mounted	/		
	Optional	3/9	3/9	3/9
	Capacity steps	1/3	1/3	1/3
	Power supply	3kW	220-240/1/50	
9kW		380-415/3/50		
LWT setting range	Cooling	5~25		
	Heating	25~65		
	DHW	30~60		

Note: 1. Testing standard: EN12102-1.

2. For three phase type backup electric heater, 3/6kW can be achieved by changing DIP switch when hydronic box is equipped with 9kW.

## Arctic Series Split Hydronic Integrated Tank




Hydronic box model		HBT-A100/190CD30GN8-B	HBT-A100/240CD30GN8-B	HBT-A160/240CD30GN8-B
Power supply		220-240/1/50		
Unit dimension (WxHxD)		600x1683x600	600x1943x600	
Packing dimension (WxHxD)		730x1920x730	730x2180x730	
Net/Gross weight		140/161	157/178	159/180
Water pump	Max. pump head	9		
	Water side	R1*		
Connection	Refrigerant liquid	6.35	9.52	
	Refrigerant gas	15.88	15.88	
Backup E-heater <sup>1</sup>	Standard mounted	3		
	Optional	6/9	6/9	6/9
	Capacity steps	2/3	2/3	2/3
	Power supply	6kW	220-240/1/50	
9kW		380-415/3/50		
LWT setting range	Cooling	5~25		
	Heating	25~65		
	DHW	30~60		

Note:

1. For three phase type backup electric heater, 3/6kW can be achieved by changing DIP switch when hydronic box is equipped with 9kW.

## Product lineup

### Mono

Capacity(KW)	5	7	9	12	14	16
Appearance						
220~240-1Ph	●	●	●	●	●	●
380~415-3Ph				●	●	●



Mini size(0.4 m<sup>3</sup>) for container-carrying capacity optimization  
(For reference: 76 units within one 40HQ container)  
Smaller floor space(0.4M<sup>2</sup>) for flexible installation



Heating, cooling, hot water, one-stop solution



Maximum 65 °C leaving water temperature



Solar hot water, Photovoltaic application for green energy-saving




Cascade function for bigger system application



USB function for convenient data transformation

### External electric heater (Optional)

3~9kW external electric heater enhances low ambient heating capacity (Optional)

Capacity(KW)	3	4.5	6	9
Appearance				
220~240-1Ph	●	●		
380~415-3Ph		●	●	●



## M thermal Power Series

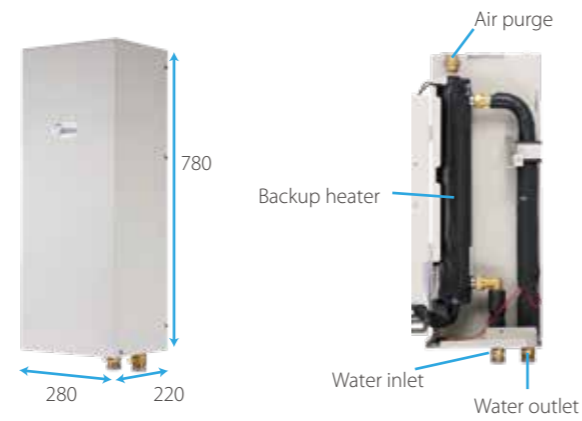
### Mini size with big energy



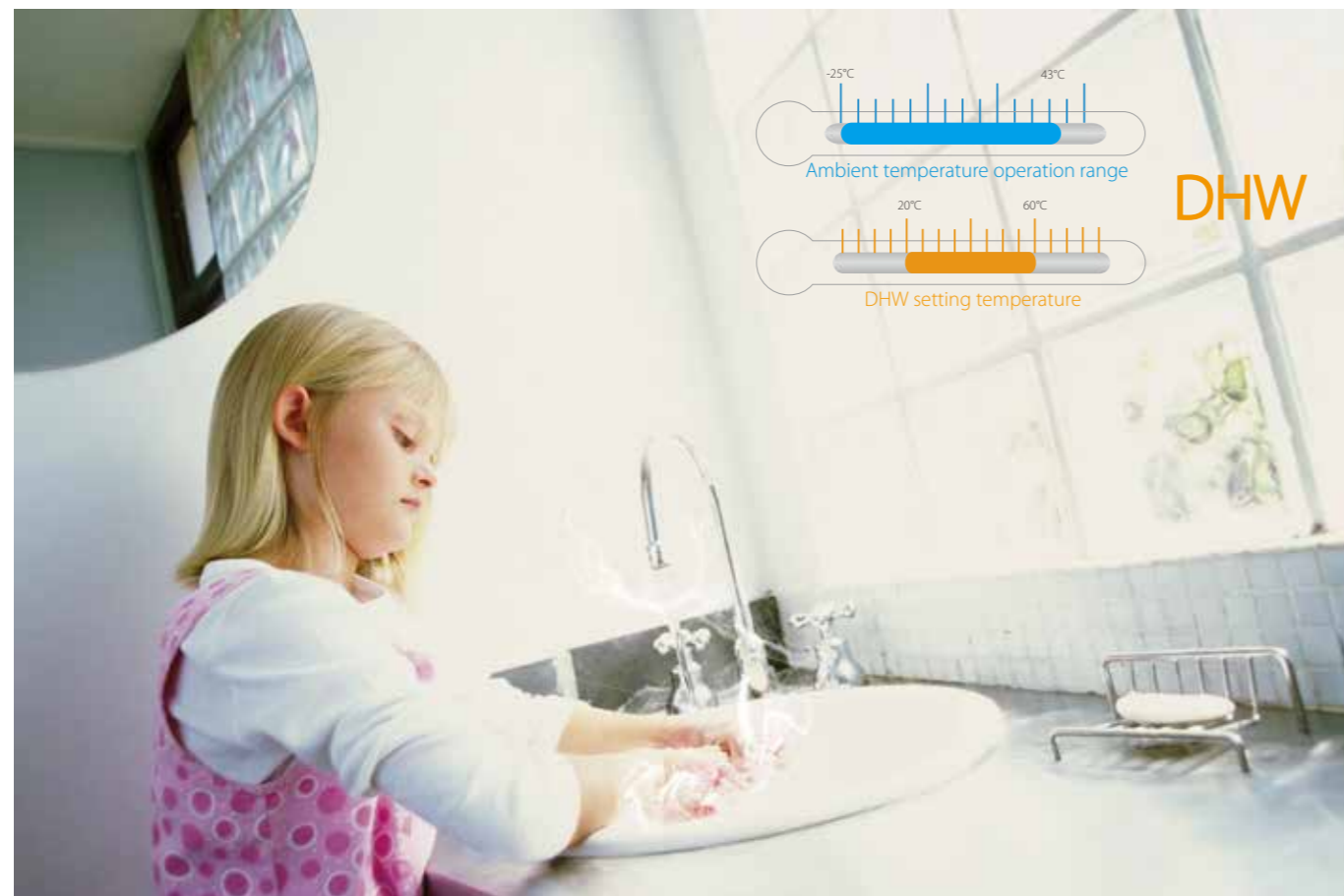
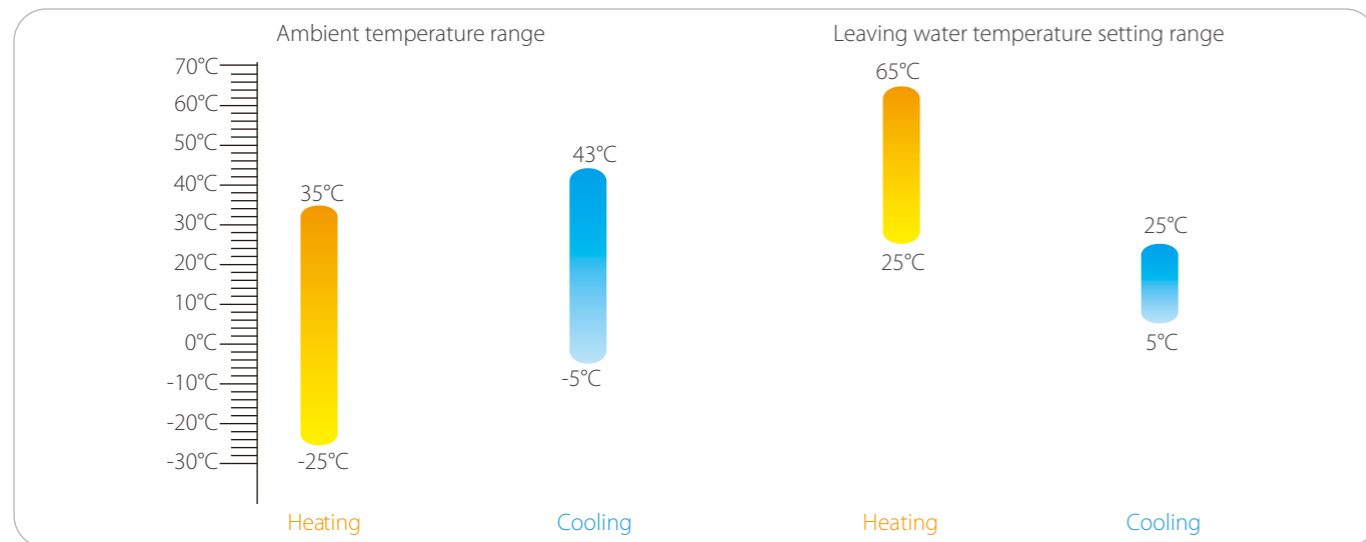
Mono 5~16kW

### External backup electric heater kit(Optional)

- Features:
- Easy installation;
- Compact structure;
- No fuel tubes and storage;
- Supply additional heating capacity;
- Complete isolation between water and electricity;



### Wide operation range



### Mini size

#### Smaller size

Container-carrying capacity optimization  
 (For reference: 76 units within one 40HQ container)  
 Transportation cost saving



#### Lighter

Easier for human transport



#### Smaller floor space

Flexible installation  
 Idea for hotels or replacement project



# High reliability

## Manual defrost

During heating/DHW mode, frost is generated and attached to the fins, which affects the heating performance. In order to recover heating capacity, heat pump enters defrost mode automatically in time. Manual defrost is also suitable for quickly defrosting according to user's demand.



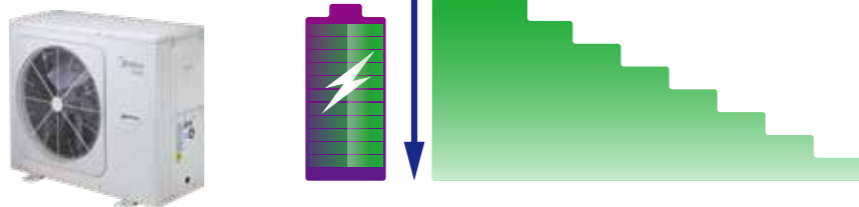
## Preheating and drying up for floor

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even ruptured during floor heating operation. We provide drying up mode which is used after the initial installation of floor loops and preheating mode for the first heating during seasonal heating in order to protect the floor. During the process, the water temperature would be increased gradually.



## Power limitation function

Power limitation function makes the machine suitable for a variety of current supplies. There are 8 configurations for user to choose according to the maximum allowable access current. Only easy setting on the wired controller is needed, the units can suit more application.



## Holiday function

### Holiday away

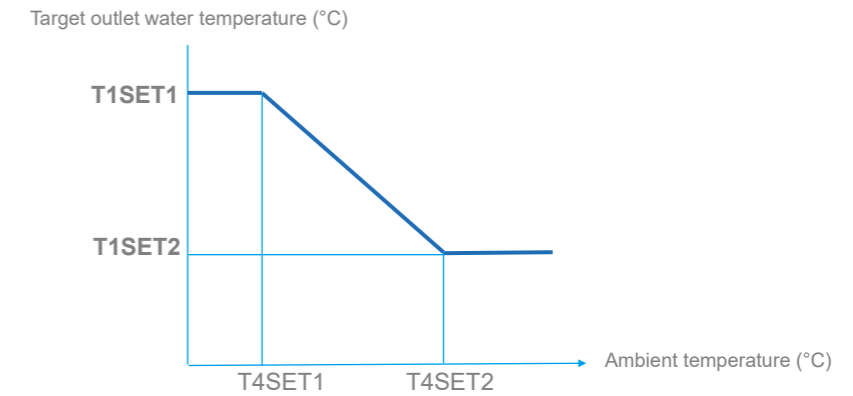
Holiday away function is a mode for improving system reliability and saving energy. Unit operates in heating mode and/or DHW mode with low water temperature to prevent water from freezing in the winter during holiday outside. The user can pre-set, the disinfection mode before he returns home to make sure that germ free water is available to be used when he returns.



# Smart control

## Weather temperature curve

With the help of Weather temperature curve function, water temperature will automatically change as outside air temperature changes, which is energy saving while satisfying comfort. Totally 32 fixed Weather temperature curve that can be manually set temperature offset and one personalized curve is available



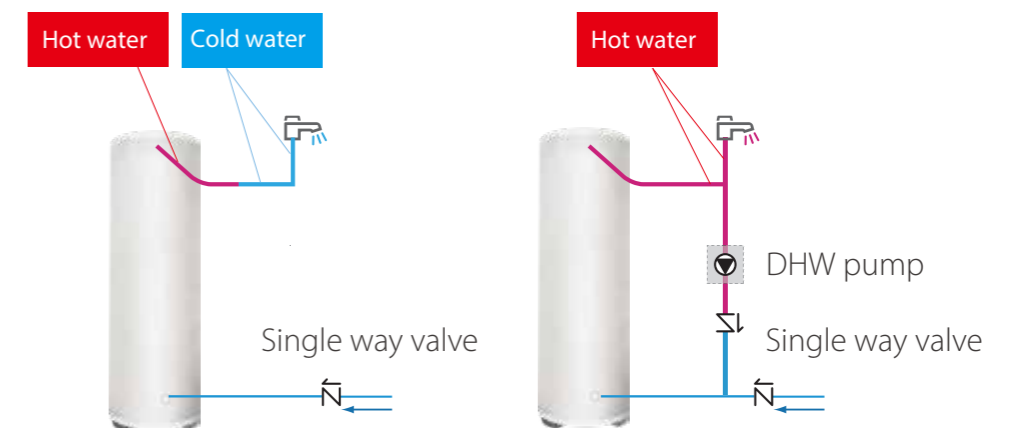
## Smart Grid

Heat pump adjusts the operation mode according to different electrical signals from the grid to realize energy saving. When the electric price is low or even free, heat pump takes DHW priority. When electric price is high, DHW related functions are limited. When the electric price is normal, heat pump operates according to users' requirement.



## DHW pump function

The DHW pump function is used to return water in the water pipe net to the hot water tank according to set timer. Total 12 timers for one day can be set, which allows users to set the DHW pump operation time according to using habit to guarantee using hot water without waiting for a long time.

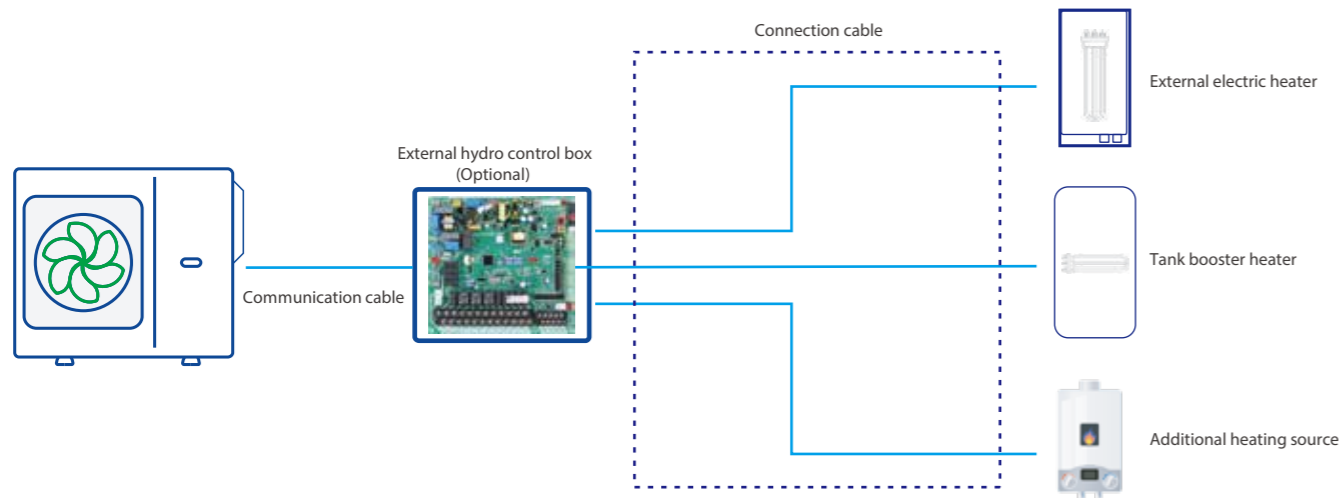




# High reliability

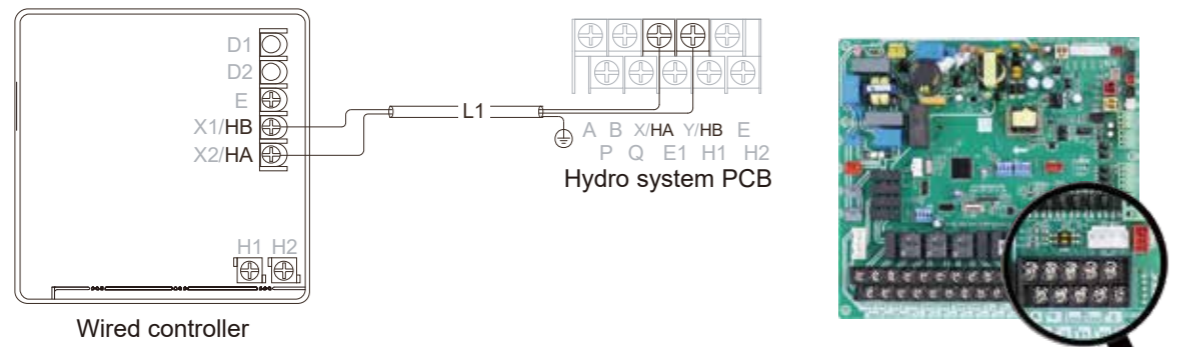
## External control box

Shorten the field connection cable length between hydro system PCB and external equipments, such as electric heater, TBH, AHS, etc., which makes the installation more flexible.



## Wired controller

Homebus protocol is applied for the wired controller. And two core shielded twisted pair cable with nonpolar installation provides strong support for reducing the risk of wrong connections.



# Convenient

## USB function

Convenient program upgrade  
 No need to carry any other heavy equipments but only USB can realize program upgrade of indoor unit and outdoor unit.  
 Parameter setting transmission between wired controllers  
 Installer can quickly copy the setting from one controller to another via USB, which save the time of on-site installation.



## Holiday home

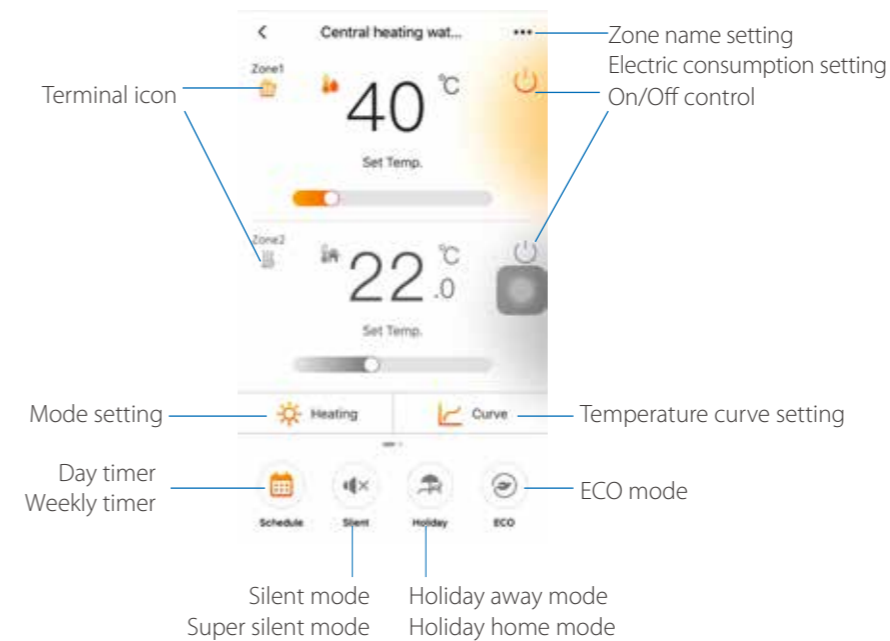
Holiday home function is used to deviate from the normal schedules without having to change them during the holiday at home.



## APP control



- Touch-key design
- Liquid Crystal Display
- Error code display
- Operation parameter checking
- Point check function
- Multiple languages
- Child lock function
- Buzzer alarm
- Built-in temperature sensor and wifi module
- Modbus protocol and network flexibility



- Easy setting
- Double zones control
- Monitor system status
- Know power consumption
- Convenient remote control
- Suggestion for energy saving
- Schedule function and timer setting

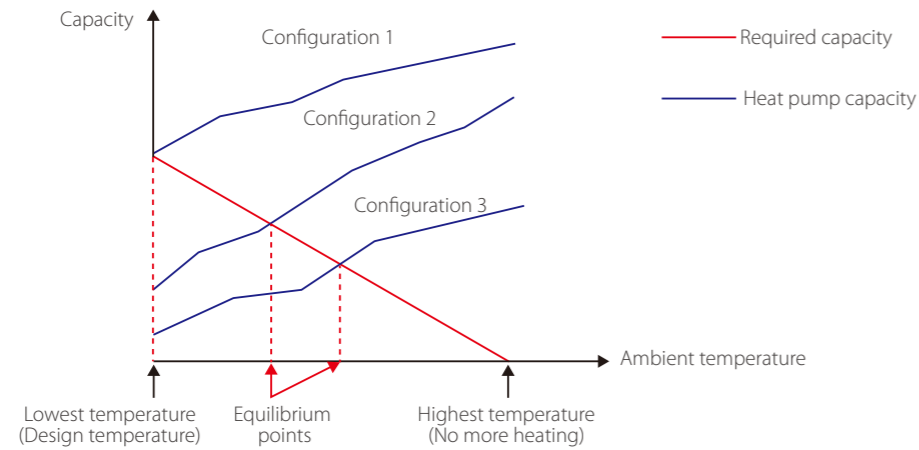
Note: APP interface changes from time to time as APP is updated and may change slightly vary from those in this document.

# Typical Applications

## System configurations

M thermal system can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.



### Configuration 1: Heat pump only

- ❖ The heat pump covers the required capacity and no extra heating capacity is necessary.
- ❖ Requires selection of larger capacity heat pump and implies higher initial investment.
- ❖ Ideal for new construction in projects where energy efficiency is paramount.

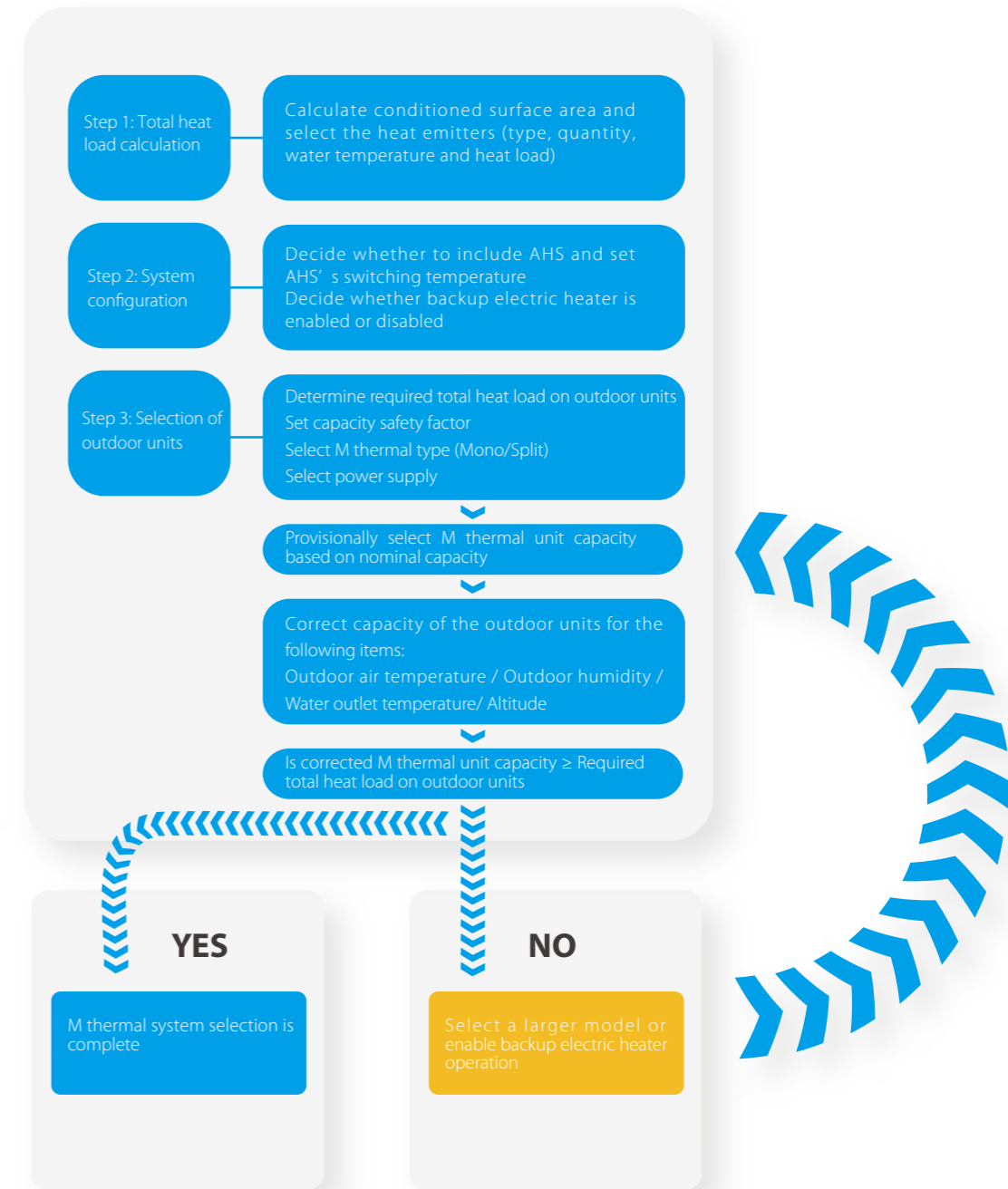
### Configuration 2: Heat pump and backup electric heater

- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- ❖ Best balance between initial investment and running costs, results in lowest lifecycle cost.
- ❖ Ideal for new construction.

### Configuration 3: Heat pump with auxiliary heat source

- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- ❖ Enables selection of lower capacity heat pump.
- ❖ Ideal for refurbishments and upgrades.

## Selection Procedure



## Leaving Water Temperature (LWT)

The recommended design LWT ranges for different types of heat emitter are:

- ❖ For floor heating: 30°C to 35°C
- ❖ For fan coil units: 40°C to 45°C
- ❖ For low temperature radiators: 40°C to 50°C

## One-stop solution - Heating, cooling and domestic hot water in one system

M thermal is an integrated system that provides space heating and cooling as well as domestic hot water, offering a complete, all-year-round solution which can remove the need for traditional gas or oil boilers, or work together with them. M thermal can be combined with floor heating loops, fan coil units, radiators and domestic water tank. It can also be connected to solar collectors, gas furnace, boiler and other heat sources.



Smart Grid certification indicates M thermal can fully utilize electricity from different sources or different price levels, which means like photovoltaic, and the peak valley of urban electricity supply to satisfy different modes operation, which is benefit for cost saving.

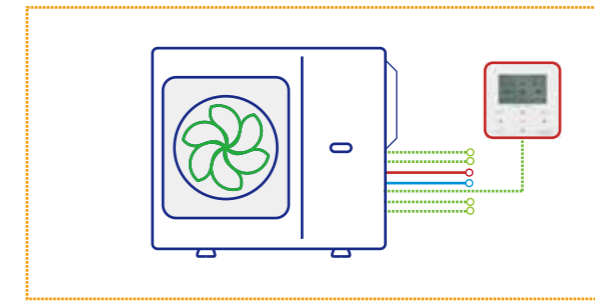


M thermal Mono outdoor unit

## Typical application

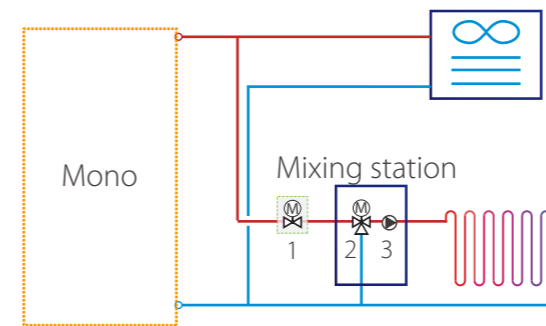
Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.

Mono



## Heating and cooling

Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. To achieve these two temperature, a mixing station (field supplied) which consists of 3-way valve and water pump is used to adapt the water temperature according to requirements of the floor heating loops. The mixing station is controlled by the unit. For cooling mode, 2-way valve is used to prevent cool water from entering floor heating loops then result in condensation during cooling.

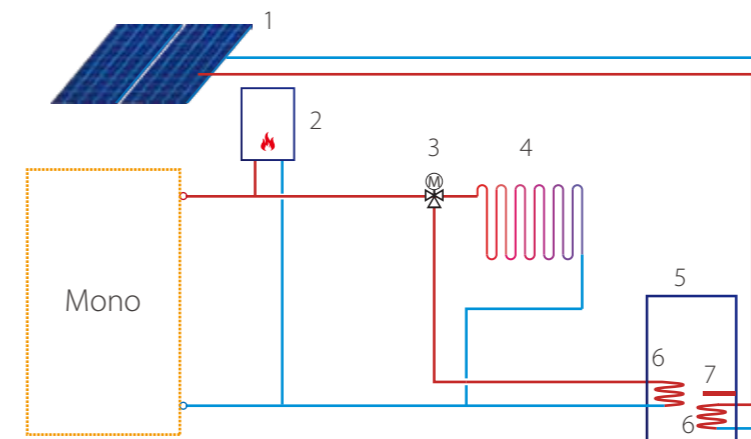


Notes:

1. 2-way valve (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)

## Heating, DHW and hybrid heat source

Backup electric heater (customized)\* and AHS provide additional heating to raise the water temperature for unit outlet temperature. TBH and solar system provide additional heating to raise the domestic hot water temperature. 3-way valve is used to switch between heating mode and DHW mode.



Notes:

1. Solar panel (field supplied)
2. AHS: Additional heating source (field supplied)
3. 3-way valve (field supplied)
4. Floor heating loop (field supplied)
5. Water tank (field supplied)
6. Heat exchanger coil (field supplied)
7. TBH: Tank booster heater (field supplied)

\* For Split model, backup electric heater can be installed in the hydraulic box.  
For Mono 4~16kW models, backup electric heater can be installed in the unit.



## Double zones control

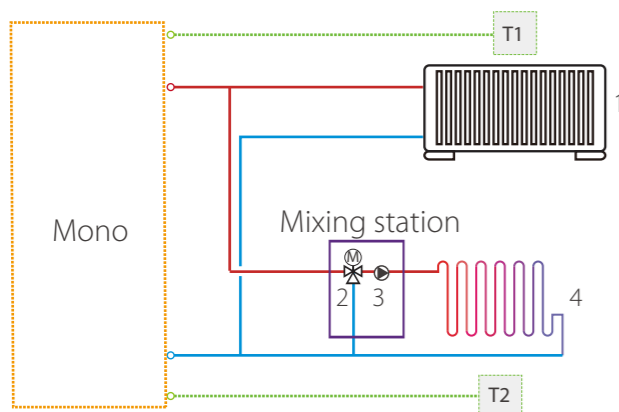
Double zones control is only available for heating mode. It can control different areas to reach different temperature to meet various needs of daily use.

1. Using wired controller only

Wired controller sets the mode, temperature and on/off. Zone 1 is controlled based on the leaving water temperature. Zone 2 is controlled based on the leaving water temperature or built-in sensor integrated in the wired controller.

2. Using wired controller and thermostat

Wired controller sets the mode and water temperature. Both Zone 1 and Zone 2 are controlled by thermostat.



Notes:

1. Radiator (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Floor heating loop (field supplied)

Abbreviation

T: Room thermostat (field supplied)

## Specifications

### Power Series Mono



Outdoor unit model		MHC-V5W D2N8-C	MHC-V7W D2N8-C	MHC-V9W D2N8-C	MHC-V12W D2N8-C	MHC-V14W D2N8-C	MHC-V16W D2N8-C	MHC-V12W D2RN8-C	MHC-V14W D2RN8-C	MHC-V16W D2RN8-C	
Heating <sup>1</sup>	Capacity	W	6500	8400	10000	12200	14100	16000	12200	14100	16000
	Rated input	W	1226	1663	2128	2490	3000	3556	2490	3000	3556
	COP		5.30	5.05	4.70	4.90	4.70	4.50	4.90	4.70	4.50
Heating <sup>2</sup>	Capacity	W	6600	8500	10200	12500	14500	16200	12500	14500	16200
	Rated input	W	1650	2237	2795	3378	4085	4696	3378	4085	4696
	COP		4.00	3.80	3.65	3.70	3.55	3.45	3.70	3.55	3.45
Heating <sup>3</sup>	Capacity	W	6300	8200	9400	12000	14000	16000	12000	14000	16000
	Rated input	W	1969	2603	3032	4000	4746	5614	4000	4746	5614
	COP		3.20	3.15	3.10	3.00	2.95	2.85	3.00	2.95	2.85
Cooling <sup>4</sup>	Capacity	W	6500	8300	10000	12200	13900	15400	12200	13900	15400
	Rated input	W	1275	1711	2326	2652	3159	3667	2652	3159	3667
	EER		5.10	4.85	4.30	4.60	4.40	4.20	4.60	4.40	4.20
Cooling <sup>5</sup>	Capacity	W	5500	7400	9000	11600	13400	14000	11600	13400	14000
	Rated input	W	1692	2349	3103	3742	4573	4828	3742	4573	4828
	EER		3.25	3.15	2.90	3.10	2.93	2.90	3.10	2.93	2.90
Seasonal space heating energy efficiency class <sup>6</sup>	Water outlet at 35°C	class	A+++								
	Water outlet at 55°C	class	A++								
Refrigerant	Type(GWP)		R32(675)								
	Charged volume	kg	1.25			1.8					
Sound power Level <sup>7</sup>	dB	60	63	65	70	72	72	70	72	72	
Net dimension (HxWxD)	mm	865x1040x410									
Packing dimension (HxWxD)	mm	970x1190x560									
Net/Gross weight	kg	87/103			106/122			120/136			
Water pump	Max. pump head	m	9								
Water piping connection	mm	G1" BSP			G5/4" BSP						
Ambient temperature range	Cooling	°C	-5 ~ 43								
	Heating	°C	-25 ~ 35								
	DHW	°C	-25 ~ 43								
LWT setting range	Cooling	°C	5 ~ 25								
	Heating	°C	25 ~ 65								
	DHW	°C	20 ~ 60								
Backup E-heater <sup>8</sup> (Optional)	Standard mounted	kW	/								
		kW	3/4.5/6/9								
	Capacity steps		1/1/2/3								
		3	220-240/1/50								
		4.5	220-240/1/50								
		4.5	380-415/3/50								
Power supply	4.5	380-415/3/50									
	6	380-415/3/50									
	9	380-415/3/50									

Notes:

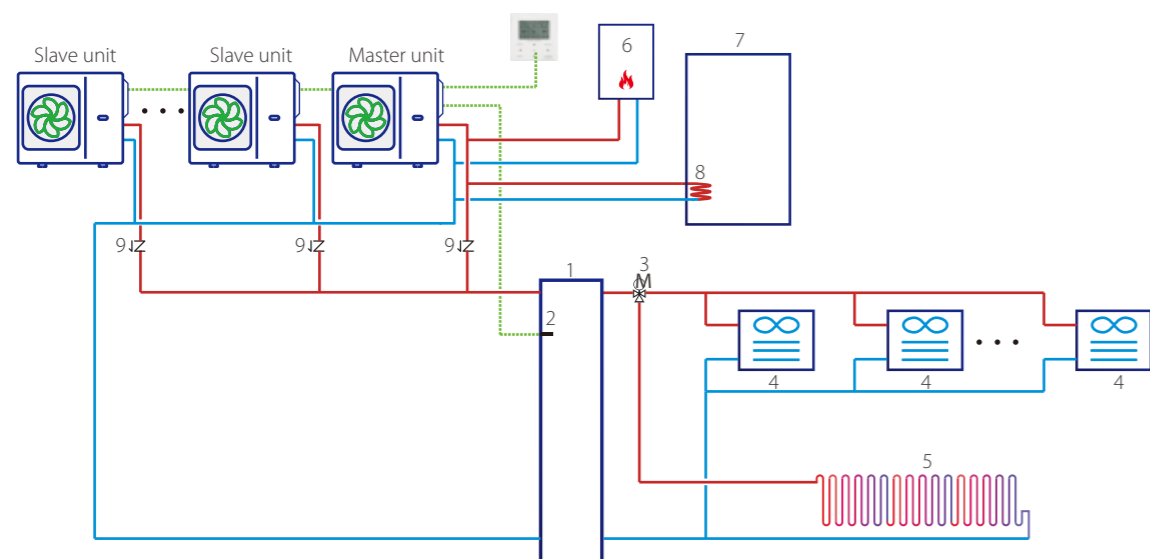
1. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 30 C, Water outlet 35 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 47 C, Water outlet 55 C.
4. Outdoor air temperature 35 C DB; Water inlet 23 C, Water outlet 18 C.
5. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
6. Seasonal space heating energy efficiency class testes in average climate general conditions.
7. Testing standard: EN12102-1.
8. Backup electric heater is external installation.
9. Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014

## Cascade system

Cascade system design is perfect when an extension of capacity becomes required as the building cooling/heating demand evolves. Maximum 6 units can be controlled in group with one controller. Balance tank temperature control makes water temperature more accurate.

Water tank can only be connected to the master unit water circuit through a three-way valve, and controlled by the master unit.

AHS can only be connected to the master waterway and controlled by the master unit.








Notes:





1. Balance tank (field supplied)
2. Balance tank temperature sensor (Midea can supply)
3. 3-way valve (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)
6. AHS: Additional heating source (field supplied)
7. Water tank (field supplied)
8. Heat exchanger coil (field supplied)
9. Single way valve (field supplied)

## Product lineup

### Aqua Eco Mini Heat Pump


Capacity(KW)	5	7	9	12	14	16
Appearance						
220~240-1Ph	●	●	●	●	●	●
380~415-3Ph				●	●	●

-  Mini size (0.4 m<sup>3</sup>) for container-carrying capacity optimization (For reference: 76 units within one 40HQ container) Smaller floor space (0.4M<sup>2</sup>) for flexible installation
-  Heating, cooling, hot water, one-stop solution
-  -5°C low ambient cooling function
-  R32 eco-friendly refrigerant with low carbon emission

-  All DC inverter design, high efficiency
-  Solar hot water, Photovoltaic application for green energy-saving
-  Cascade function for bigger system application
-  USB function for convenient data transformation

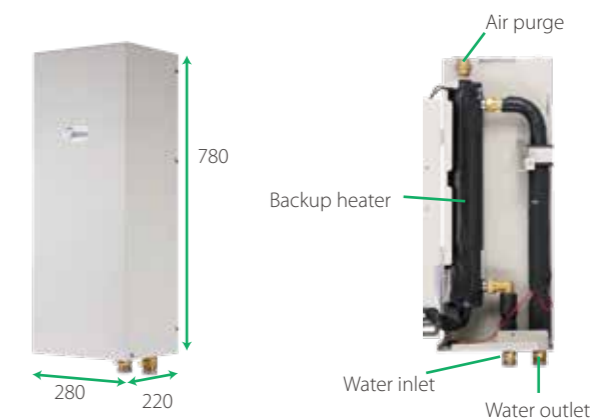
### External electric heater (Optional)

3~9kW external electric heater enhances low ambient heating capacity (Optional)

Capacity (KW)	3	4.5	6	9
Appearance				
220~240-1Ph	●	●		
380~415-3Ph		●	●	●

### External backup electric heater kit(Optional)

- Features:
- Easy installation;
  - Compact structure;
  - No fuel tubes and storage;
  - Supply additional heating capacity;
  - Complete isolation between water and electricity;



5~16kW

## Aqua Eco Mini Heat Pump Low-carbon lifestyle



## High reliability

### Manual defrost

During heating/DHW mode, frost is generated and attached to the fins, which affects the heating performance. In order to recover heating capacity, heat pump enters defrost mode automatically in time. Manual defrost is also suitable for quickly defrosting according to user's demand.



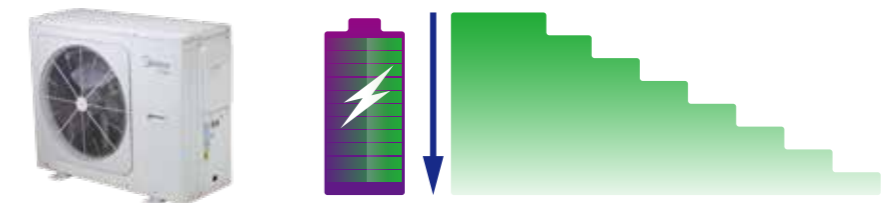
### Preheating and drying up for floor

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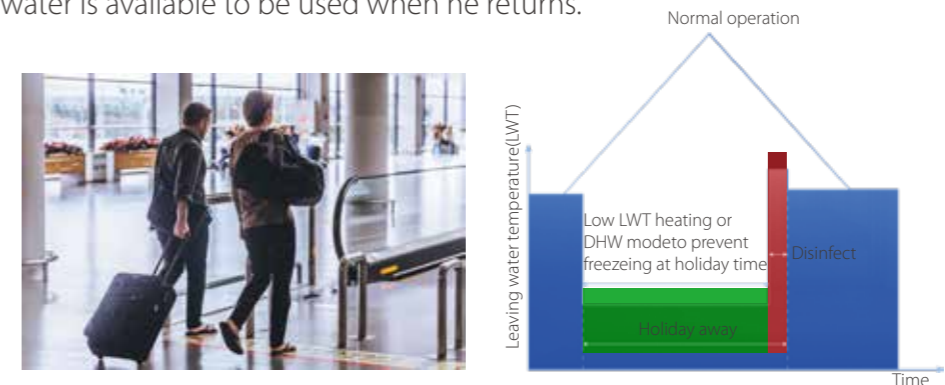
### Power limitation function

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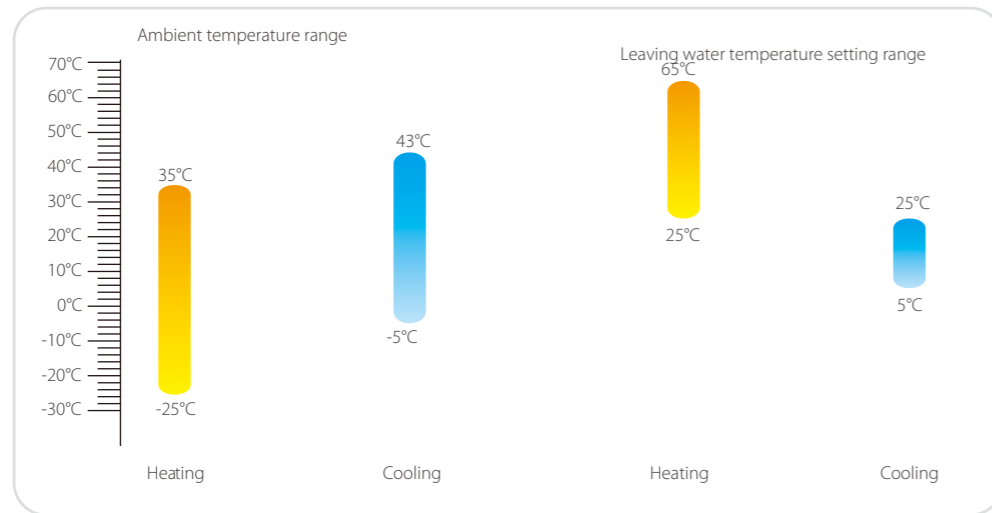


### Holiday away

Holiday away function is a mode for improving system reliability and saving energy. Unit operates in heating mode and/or DHW mode with low water temperature to prevent water from freezing in the winter during holiday outside. The user can pre-set the disinfection mode before he returns home to make sure that germ free water is available to be used when he returns.



## Wide operation range



## Mini size

### Smaller size

- ❖ Container-carrying capacity optimization (For reference: 76 units within one 40HQ container)
- ❖ Transportation cost saving



### Lighter

- ❖ Easier for human transport



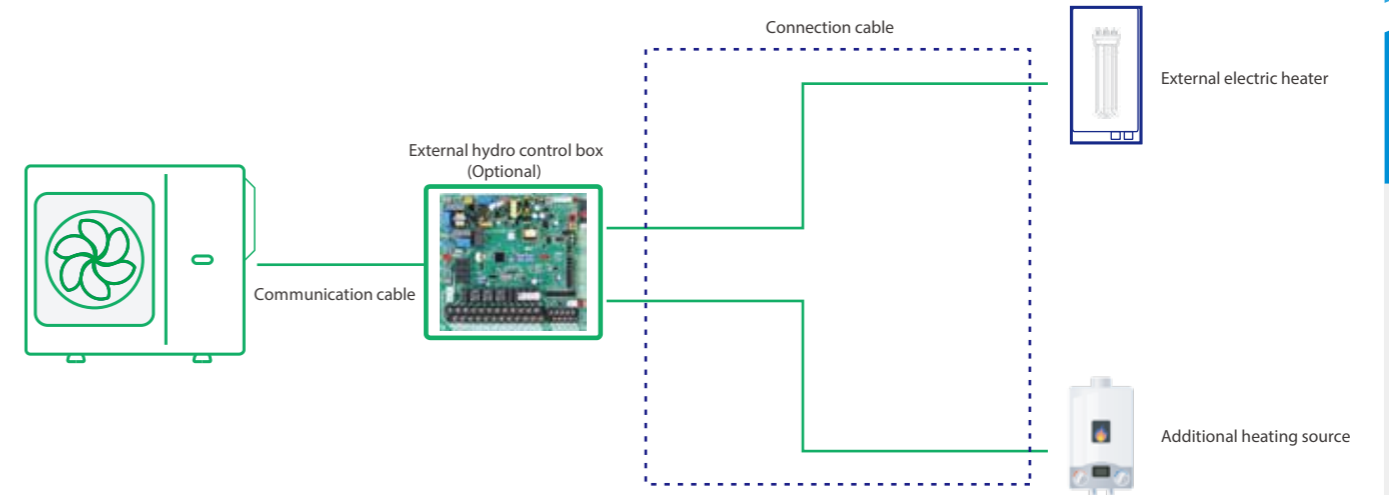
### Smaller floor space

- ❖ Flexible installation
- ❖ Idea for hotels or replacement project



### External control box

Shorten the field connection cable length between hydro system PCB and external equipments, such as electric heater, AHS, etc. , which makes the installation more flexible.



### Convenient

#### USB function

Convenient program upgrade

No need to carry any other heavy equipments but only USB can realize program upgrade of indoor unit and outdoor unit.

Parameter setting transmission between wired controllers

Installer can quickly copy the setting from one controller to another via USB, which save the time of on-site installation.



#### Holiday home

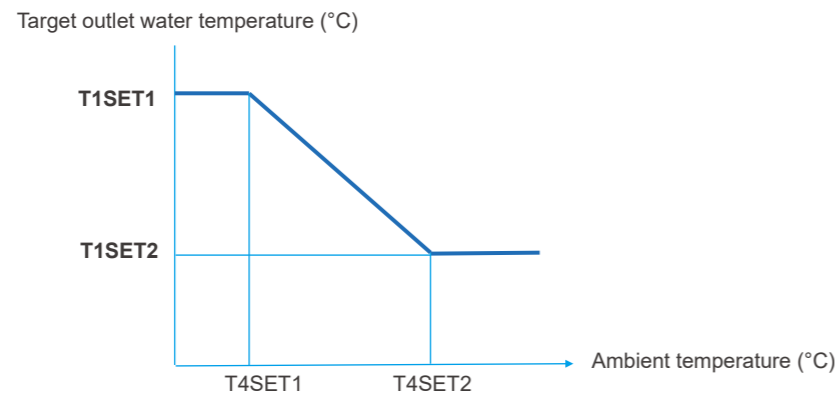
Holiday home function is used to deviate from the normal schedules without having to change them during the holiday at home.



## Smart control

### Weather temperature curve

With the help of Weather temperature curve function, water temperature will automatically change as outside air temperature changes, which is energy saving while satisfying comfort. Totally 32 fixed Weather temperature curve that can be manually set temperature offset and one personalized curve is available, which meets the diversified comfort requirement.



### Smart Grid

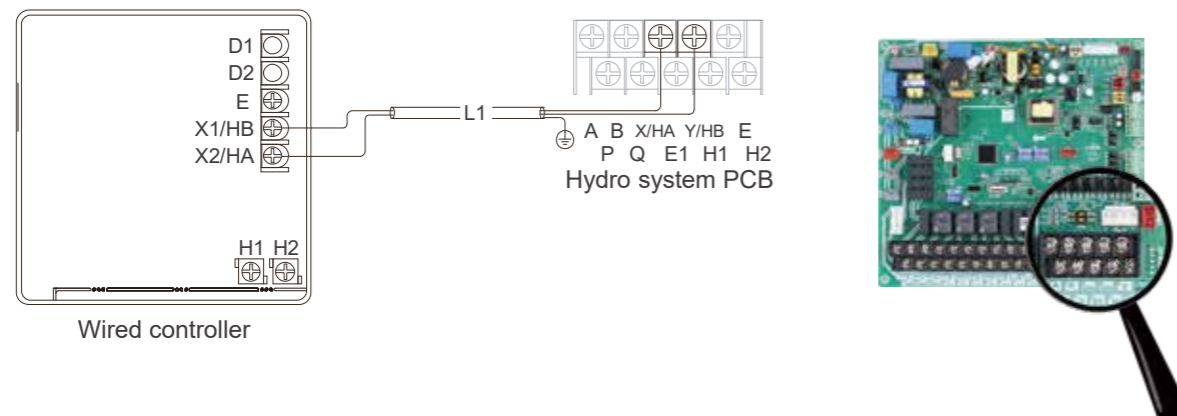
Heat pump adjusts the operation mode according to different electrical signals from the grid to realize energy saving. When the electric price is low or even free, heat pump takes DHW priority. When electric price is high, DHW related functions are limited. When the electric price is normal, heat pump operates according to users' requirement.



## Easy installation

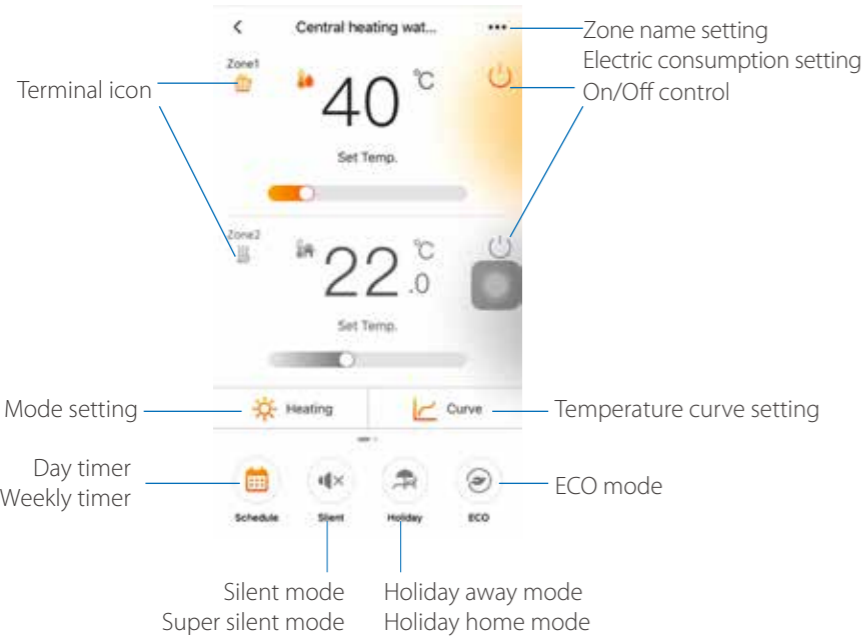
### Wired controller

Homebus protocol is applied for the wired controller. And two core shielded twisted pair cable with nonpolar installation provides strong support for reducing the risk of wrong connections.



## APP control

- Touch-key design
- Liquid Crystal Display
- Error code display
- Operation parameter checking
- Point check function
- Multiple languages
- Child lock function
- Buzzer alarm
- Built-in temperature sensor and wifi module
- Modbus protocol and network flexibility



- Easy setting
- Double zones control
- Monitor system status
- Know power consumption
- Convenient remote control
- Suggestion for energy saving
- Schedule function and timer setting

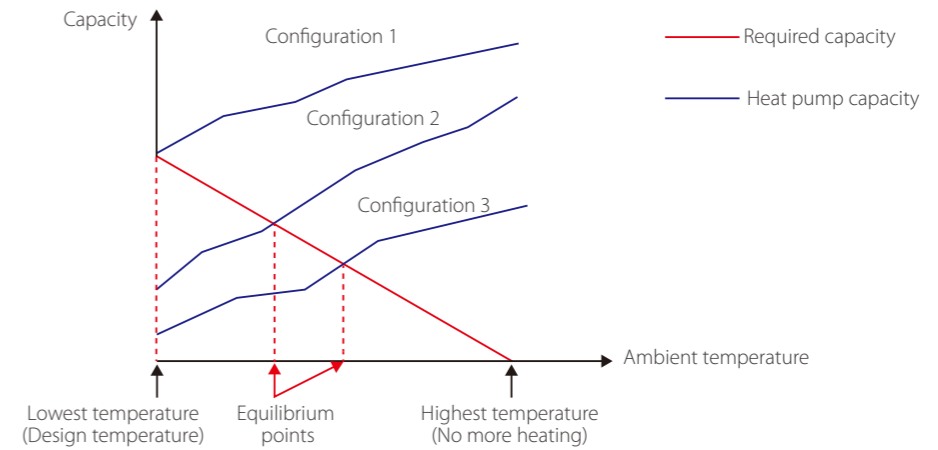
Note: APP interface changes from time to time as APP is updated and may change slightly vary from those in this document.

## Typical Applications

### System configurations

M thermal system can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.



#### Configuration 1: Heat pump only

- ❖ The heat pump covers the required capacity and no extra heating capacity is necessary.
- ❖ Requires selection of larger capacity heat pump and implies higher initial investment.
- ❖ Ideal for new construction in projects where energy efficiency is paramount.

#### Configuration 2: Heat pump and backup electric heater

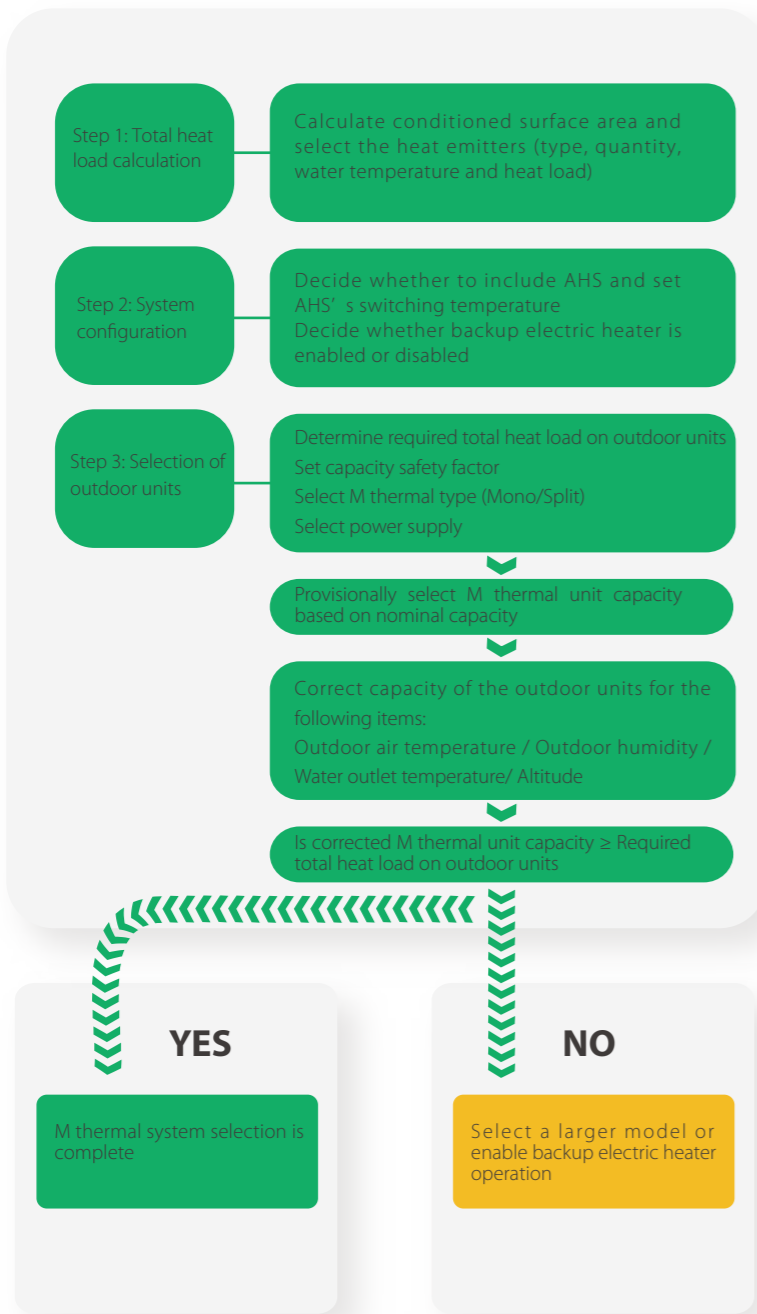
- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- ❖ Best balance between initial investment and running costs, results in lowest lifecycle cost.
- ❖ Ideal for new construction.

#### Configuration 3: Heat pump with auxiliary heat source

- ❖ Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- ❖ Enables selection of lower capacity heat pump.
- ❖ Ideal for refurbishments and upgrades.



## Selection Procedure

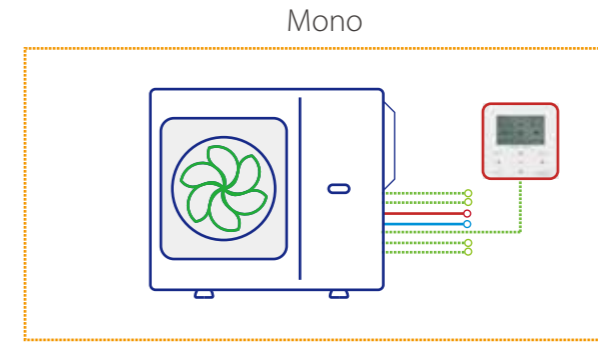


## Leaving Water Temperature (LWT)

- The recommended design LWT ranges for different types of heat emitter are:
- ❖ For floor heating: 30°C to 35°C
  - ❖ For fan coil units: 40°C to 45°C
  - ❖ For low temperature radiators: 40°C to 50°C

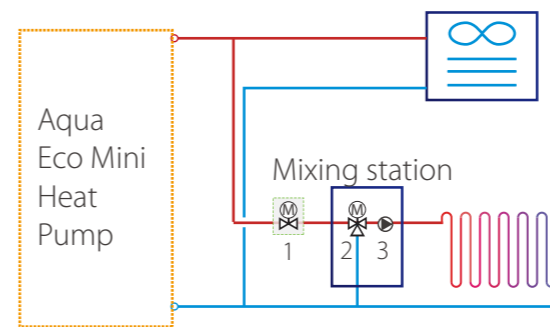
## Typical application

Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.



## Heating and cooling

Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. To achieve these two temperature, a mixing station (field supplied) which consists of 3-way valve and water pump is used to adapt the water temperature according to requirements of the floor heating loops. The mixing station is controlled by the unit. For cooling mode, 2-way valve is used to prevent cool water from entering floor heating loops then result in condensation during cooling.



- Notes:
1. 2-way valve (field supplied)
  2. 3-way valve (field supplied)
  3. Water pump (field supplied)
  4. Fan coil unit (Midea can supply)
  5. Floor heating loop (field supplied)

## Double zones control

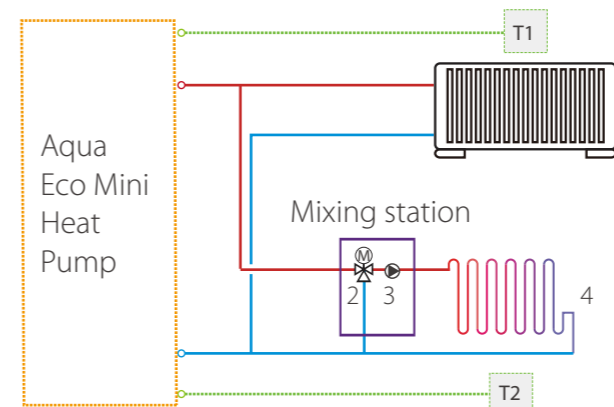
Double zones control is only available for heating mode. It can control different areas to reach different temperature to meet various needs of daily use.

1. Using wired controller only

Wired controller sets the mode, temperature and on/off. Zone 1 is controlled based on the leaving water temperature. Zone 2 is controlled based on the leaving water temperature or built-in sensor integrated in the wired controller.

2. Using wired controller and thermostat

Wired controller sets the mode and water temperature. Both Zone 1 and Zone 2 are controlled by thermostat.

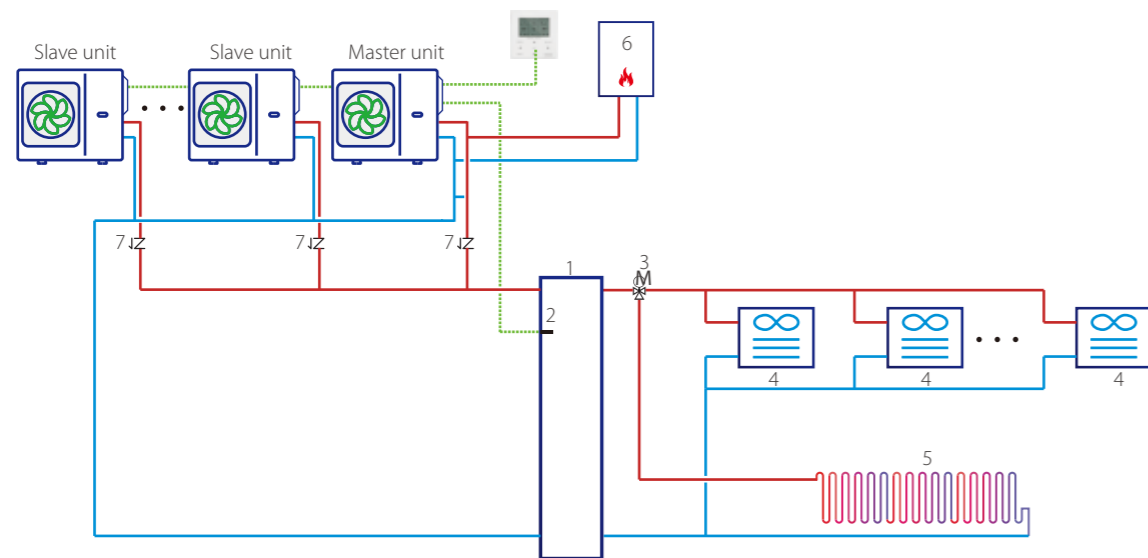


- Notes:
1. Radiator (field supplied)
  2. 3-way valve (field supplied)
  3. Water pump (field supplied)
  4. Floor heating loop (field supplied)

Abbreviation  
T: Room thermostat (field supplied)

## Cascade system

Cascade system design is perfect when an extension of capacity becomes required as the building cooling/heating demand evolves. Maximum 6 units can be controlled in group with one controller. Balance tank temperature control makes water temperature more accurate. AHS can only be connected to the master waterway and controlled by the master unit.



### Notes:

1. Balance tank (field supplied)
2. Balance tank temperature sensor (Midea can supply)
3. 3-way valve (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)
6. AHS: Additional heating source (field supplied)
7. Single way valve (field supplied)



## Aqua Eco Mini Heat Pump

Outdoor unit model			MGC-V5WD2N8-B	MGC-V7WD2N8-B	MGC-V9WD2N8-B	MGC-V12WD2N8-B	
Cooling <sup>1</sup>	Capacity	W	5500	7400	9000	11600	
	Rated input	W	1692	2349	3103	3742	
	EER		3.25	3.15	2.90	3.10	
Heating <sup>2</sup>	Capacity	W	6600	8500	10200	12500	
	Rated input	W	1650	2237	2795	3378	
	COP		4.00	3.80	3.65	3.70	
Refrigerant	Type(GWP)		R32(675)				
	Charged volume	kg	1.25			1.8	
Sound power Level <sup>3</sup>		dB	60	63	65	70	
Net dimension (HxWxD)		mm	865x1040x410				
Packing dimension (HxWxD)		mm	970x1190x560				
Net/Gross weight		kg	87/103			106/122	
Water pump	Max. pump head	m	9				
Water piping connection		mm	G1" BSP			G5/4" BSP	
Ambient temperature range	Cooling	°C	-5 ~ 43				
	Heating	°C	-25 ~ 35				
LWT setting range	Cooling	°C	5 ~ 25				
	Heating	°C	25 ~ 65				
Backup E-heater <sup>4</sup> Optional	Standard mounted	kW	/				
	Optional	kW	3/4.5/6/9				
	Capacity steps			1/1/2/3			
	Power supply	3	V/Ph/Hz	220-240/1/50			
		4.5		220-240/1/50			
		4.5		380-415/3/50			
6		380-415/3/50					
9		380-415/3/50					

### Notes:

1. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.
2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.
3. Testing standard: EN12102-1.
4. Backup electric heater is external installation.



Outdoor unit model			MGC-V14WD2N8-B	MGC-V16WD2N8-B	MGC-V12WD2RN8-B	MGC-V14WD2RN8-B	MGC-V16WD2RN8-B	
Cooling <sup>1</sup>	Capacity	W	13400	14000	11600	13400	14000	
	Rated input	W	4573	4828	3742	4573	4828	
	EER		2.93	2.90	3.10	2.93	2.90	
Heating <sup>2</sup>	Capacity	W	14500	16200	12500	14500	16200	
	Rated input	W	4085	4696	3378	4085	4696	
	COP		3.55	3.45	3.70	3.55	3.45	
Refrigerant	Type(GWP)		R32(675)					
	Charged volume	kg	1.8					
Sound power Level <sup>3</sup>		dB	72	72	70	72	72	
Net dimension (HxWxD)		mm	865x1040x410					
Packing dimension (HxWxD)		mm	970x1190x560					
Net/Gross weight		kg	106/122		120/136			
Water pump	Max. pump head	m	9					
Water piping connection		mm	G5/4"BSP					
Ambient temperature range	Cooling	°C	-5 ~ 43					
	Heating	°C	-25 ~ 35					
LWT setting range	Cooling	°C	5 ~ 25					
	Heating	°C	25 ~ 65					
Backup E-heater <sup>4</sup> Optional	Standard mounted	kW	/					
	Optional	kW	3/4.5/6/9					
	Capacity steps			1/1/2/3				
	Power supply	3	V/Ph/Hz	220-240/1/50				
		4.5		220-240/1/50				
		4.5		380-415/3/50				
6		380-415/3/50						
	9	380-415/3/50						

Notes:  
 1. Outdoor air temperature 35 C DB; Water inlet 12 C, Water outlet 7 C.  
 2. Outdoor air temperature 7 C DB, 6 C WB; Water inlet 40 C, Water outlet 45 C.  
 3. Testing standard: EN12102-1.  
 4. Backup electric heater is external installation.

## M thermal Accessory(Optional)

### 3-way valve

Match with	Accessory description	Accessory type	Connecting description
Midea 2-pipe Duct	LSP & MSP 2/3/4 row 3-way valve accessory 3-way valve piping assembly	FP-204WA	general for left and right connecting
	HSP 3 row 3-way valve accessory 3-way valve piping assembly	FP-136/238/306WA	general for left and right connecting
Midea 4-pipe Duct	LSP & MSP 3-way valve accessory 3-way valve piping assembly	FP-34WA-Z3-G30	left connecting
	Midea 4-way Cassette	2-pipe 3-way valve accessory 3-way valve piping assembly	FP-255KBM
4-pipe 3-way valve accessory 3-way valve piping assembly		FP-12.5KBM	left connecting
	Midea 4-way Compact Cassette	2-pipe 3-way valve accessory 3-way valve piping assembly	FP-68KBM
4-pipe 3-way valve accessory 3-way valve piping assembly		FP-68KBM	left connecting
	Midea 2nd generation Ceiling & Floor	2/4-pipe 150~700 3-way valve accessory 3-way valve piping assembly	FP-51LM
2/4-pipe 800 3-way valve accessory 3-way valve piping assembly		FP-136LM	left/right connecting

Notes:  
 3-way valve accessory: With 3-way valve  
 3-way valve piping assembly: Without 3-way valve






### Thermostat









Match table	Thermostat description
Midea AC 2nd generation Ceiling & Floor	Mechanical thermostat
Midea AC/DC Duct	Mode control
	Fan speeds control
	Temp. setting
Midea AC/DC Cassette	Receiving remote signal
Midea Wall-mounted	Mode control
	Fan speeds control
	Temp. setting
Midea DC 2nd generation Ceiling & Floor	LED display screen
Midea DC one-way cassette	Mode control
	Seven speed fan control
	Temp. setting
Midea AC 2nd generation Ceiling & Floor	LED display screen
Midea AC/DC Duct	Mode control
	Fan speeds control
	Temp./Timer setting
	ECO setting/reminder
Midea AC 2nd generation Ceiling & Floor	LED display screen
Midea AC/DC Duct	Mode/Electric heater control
	Fan speeds control
	Temp./Timer setting
	ECO setting/reminder
	Compatible with Modbus

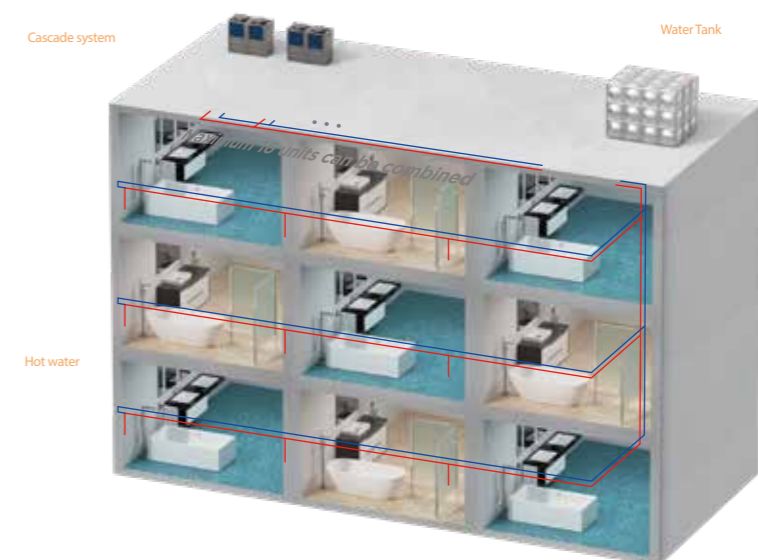


# Water Cycle Heating Commercial Water Heater

## Product lineup

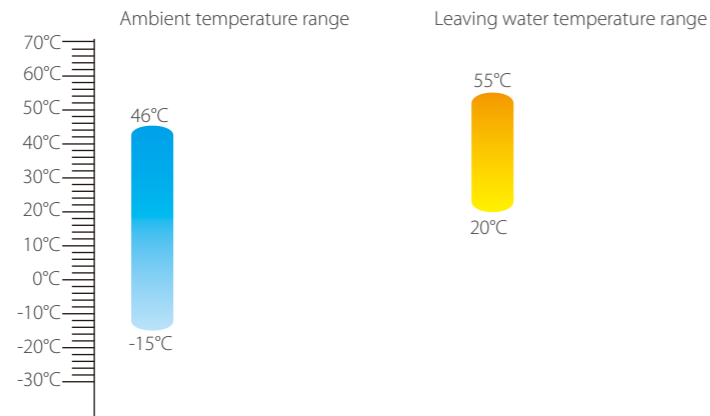
Heating type	Subtype	Series	Product	Power supply (V/N/Hz)	Refrigerant	Capacity(kW)			
						10	20	40	90
Water cycle heating	Normal	Standard		220~240/1/50	R410A	●			
				380~415/3/50	R410A		●		
				380~415/3/50	R410A				●
		Power		380~415/3/50	R410A				

-  Hot water application, up to 55 °C
-  Intelligent and duty defrost ensure heating comfort
-  Minimum -15 °C ambient operation range
-  Multiple protection enhances system reliability
-  Cascade function for bigger system capacity
-  DC Inverter technology for high efficiency(Power Series)
-  Auxiliary heat source control satisfies heating demand at low temperature
-  Refrigerant cooling electric control system(Power Series)



# Main Features

## Wide operation range

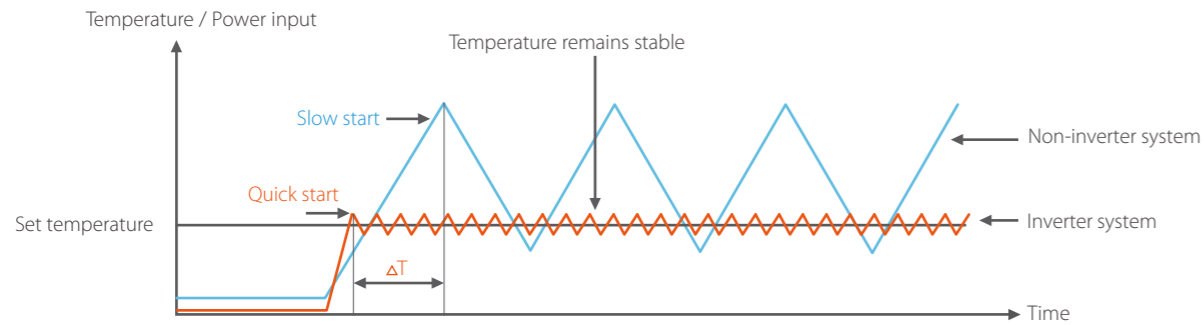


## DC Inverter technology

Note: Only apply to MHW-VC40RN1.

### • Stable water temperature improves comfort

Precise control of the compressor rotation speed ensures that the water temperature is maintained within a much smaller range around the set temperature.



### • Quick start-up

Inverter system outputs power according to the energy demand by adjusting motor rotary frequency to quickly start and achieve comfort conditions in short time.

### • Less frequent start/stop

The ability to vary compressor speed means compressor experiences fewer start/stop cycles, which expands compressor lifespan.

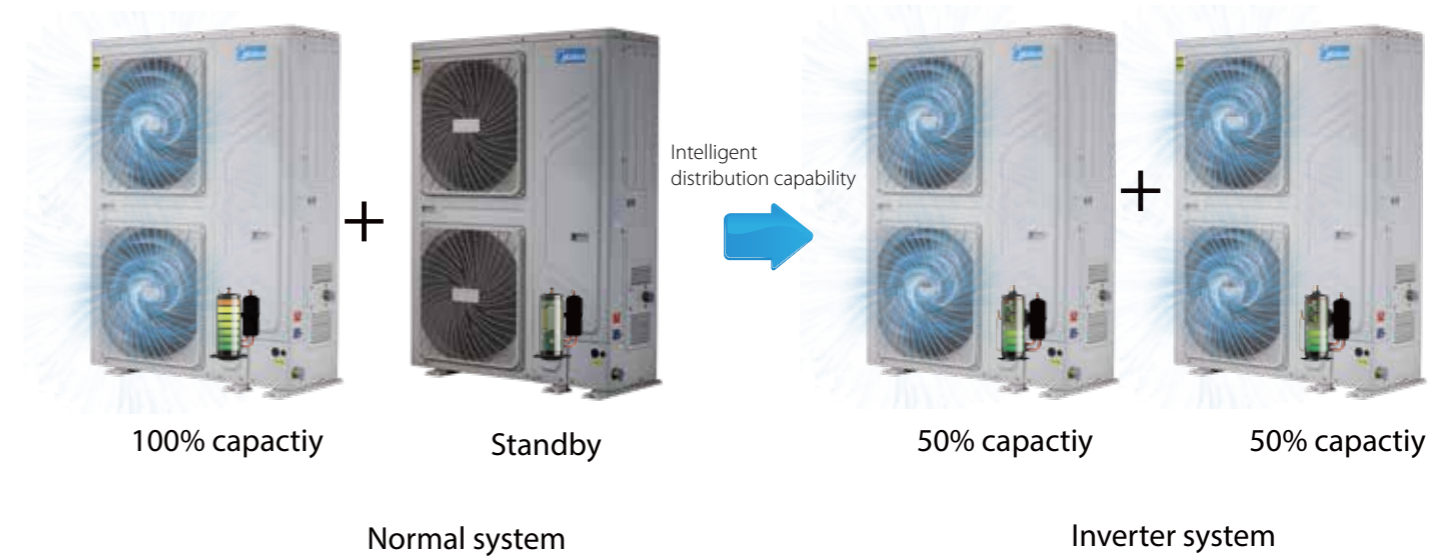
### • Quiet operation

Most of the time, the capacity required is lower than the peak load condition. With DC inverter compressors adjusting rotation speed according to the actual load requirement, noise level is lower than with traditional compressor technology.

## Energy saving

### • High efficiency

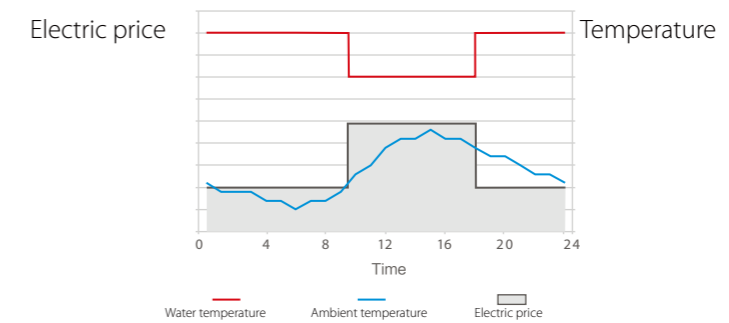
Capacity can be reasonably distributed across units in inverter system. Each unit can maintain the highest energy efficiency state to make full use of the heat exchanger ability and avoid the loss of parts at full load.



### • Multistage timing and temperature preset

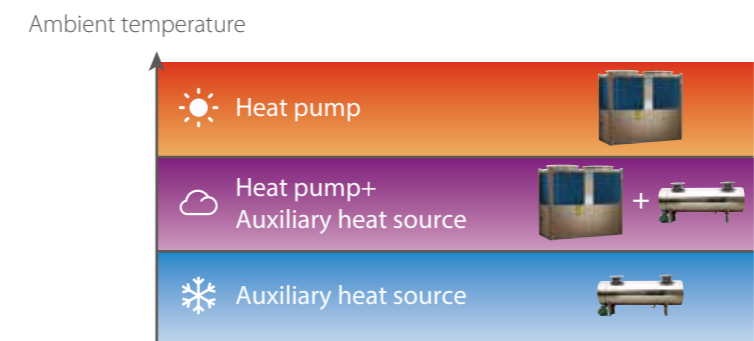
Note: Only apply to KJRX-120ABMCO wired controller.

User can preset water temperature according to the temperature and electricity price in different periods of time to achieve cost saving while maintaining comfort.



### • Intelligent auxiliary heat source control

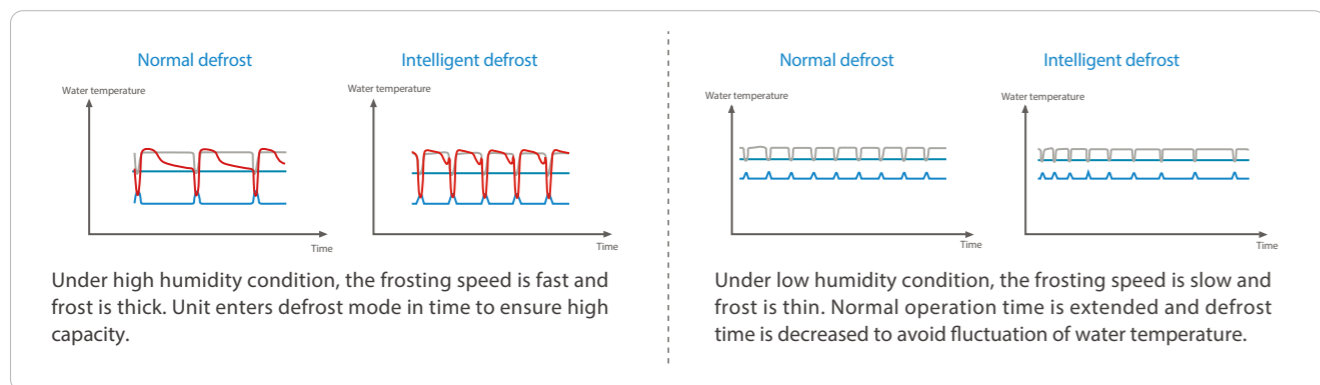
The auxiliary heat source can be controlled by units to provide heating in low ambient temperature and enhance efficiency of heating system.



## Comfort

### • Intelligent defrost

Unit enters defrost mode and adjusts defrost period according to ambient temperature, frost forming speed etc to reduce capacity attenuation and fluctuation of water temperature,



### • Duty defrost

Through the system or unit duty defrost, fluctuation of water temperature can be maximum decreased while maintaining comfort, which is benefit for reducing the investment of water tank.

Unit duty defrost



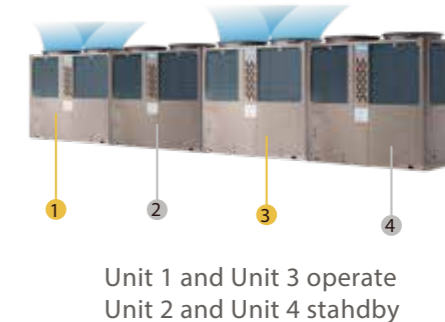
System duty defrost



## Reliable

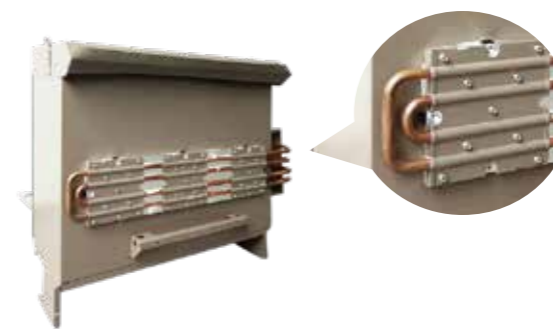
### • Duty cycling

In cascade system, all slave units operate as alternative in cycle duty to keep equal running time, realize higher stability, better reliability and longer lifespan.



### • Refrigerant Cooling PCB

Refrigerant cooling effectively reduce the temperature of electronic components for inverter system under harsh working conditions, which ensures the stable and safe operation of the control system.



### • Multiple protection

- High/low pressure protection of compressor
- Power phases sequence protection
- Evaporator low temperature protection in cooling
- System anti-freezing protection in winter
- Frequent compressor ON/OFF protection
- Over-current protection of compressor
- Discharge temperature protection of compressor
- System high temperature protection
- Water flow protection
- Sensor malfunction protection

## Easy control

### Friendly man-machine interaction

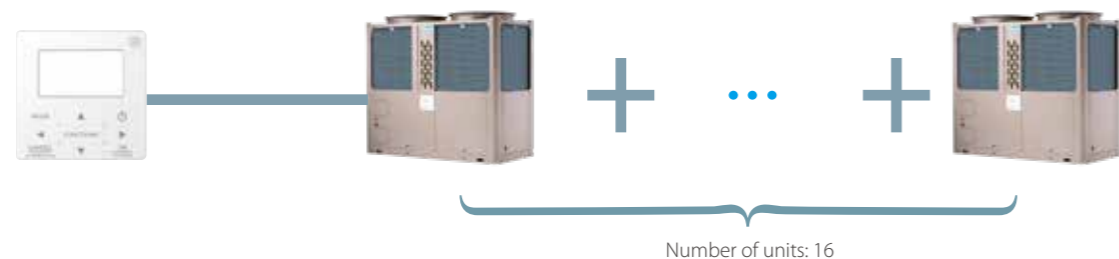
Controller		Adaption model
KJR-51BMKE-A(modbus)		MHW-C10N1 MHW-C20RN1
KJRX-120ABMKO		MHW-VC40RN1 MHW-C90RN1

- Touch-key design
- Liquid Crystal Display
- Water temperature and level setting
- Self-lock function
- Auxiliary heat source control
- Modbus protocol and network flexibility
- Daily and weekly schedule\*
- Multiple mode setting(Silent, Holiday, Defrost, Anti-freeze, Air purge)\*
- Master and slave controller function\*

\*Note: Only apply to KJRX-120ABMKO

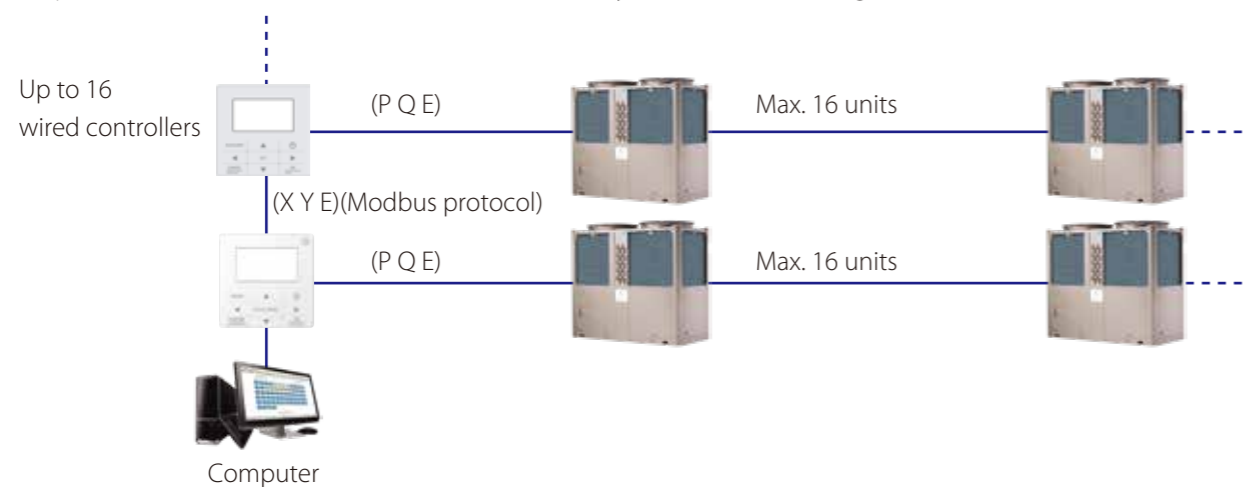
### Group control

The modular design provides a powerful advantage when building loads rise. Multiple units can be connected in parallel for greater system capability which ranges from 10~1440kW and can be controlled by one controller.



### Modbus function

Modbus is an open protocol that is widely used, especially in BMS building control systems. The controller is standard with Modbus protocol, which allows to access to the BMS control system for better management.



## Specifications

Series		Standard			Power
Model name		MHW-C10N1	MHW-C20RN1	MHW-C90RN1	MHW-VC40RN1
Power supply		V/Ph/Hz	220-240/1/50	380-415/3/50	380-415/3/50
Water heating <sup>1</sup>	Capacity	kW	10.3	21	91
	Rated power input	kW	2.51	4.94	20
	COP		4.1	4.25	4.55
Max. power input		kW	4.480	8.4	32.0
Max. input current		A	21	15	60
Compressor	Type		Rotary	Rotary	Scroll
	Quantity		1	1	1
Outdoor fan	Motor type		AC motor	AC motor	AC motor
	Fan type		Axial fan	Axial fan	Axial fan
	Number of fans		1	1	2
Air side heat exchanger	Type		Finned tube	Finned tube	Finned tube
Water side heat exchanger	Type		Double-pipe heat exchanger	Double-pipe heat exchanger	Double-pipe heat exchanger
	Material		Copper	Copper	Copper
Refrigerant	Type		R410A	R410A	R410A
	Charged volume	kg	1.1	1.8	12.8
Throttle type			Electronic expansion valve	Electronic expansion valve	Electronic expansion valve
Outdoor noise level	dB(A)		63	64	70
Unit dimension (WxHxD)	mm		1038x1139x410	1038x1139x410	1995x1790x960
Packing dimension (WxHxD)	mm		1170x1300x560	1170x1300x560	2085x1900x1030
Net weight	kg		100	123	580
Gross weight	kg		117	136	585
Water piping connections Dia.			DN25	DN25	DN65
Water pressure drop	kPa		35	55	62
Wire controller			KJR-51BMKE-A(modbus)	KJR-51BMKE-A(modbus)	KJR-51BMKE-A(modbus)
Hot water yield	m <sup>3</sup> /h		0.221	0.451	1.956
Ambient temperature range	°C		-15 ~ 46	-15 ~ 46	-15 ~ 46
Water outlet temperature range	°C		20-55	20-55	20-55

Notes:

1. Outdoor air temperature 20 C DB, 15 C WB; Water inlet 15 C, Water outlet 55 C.

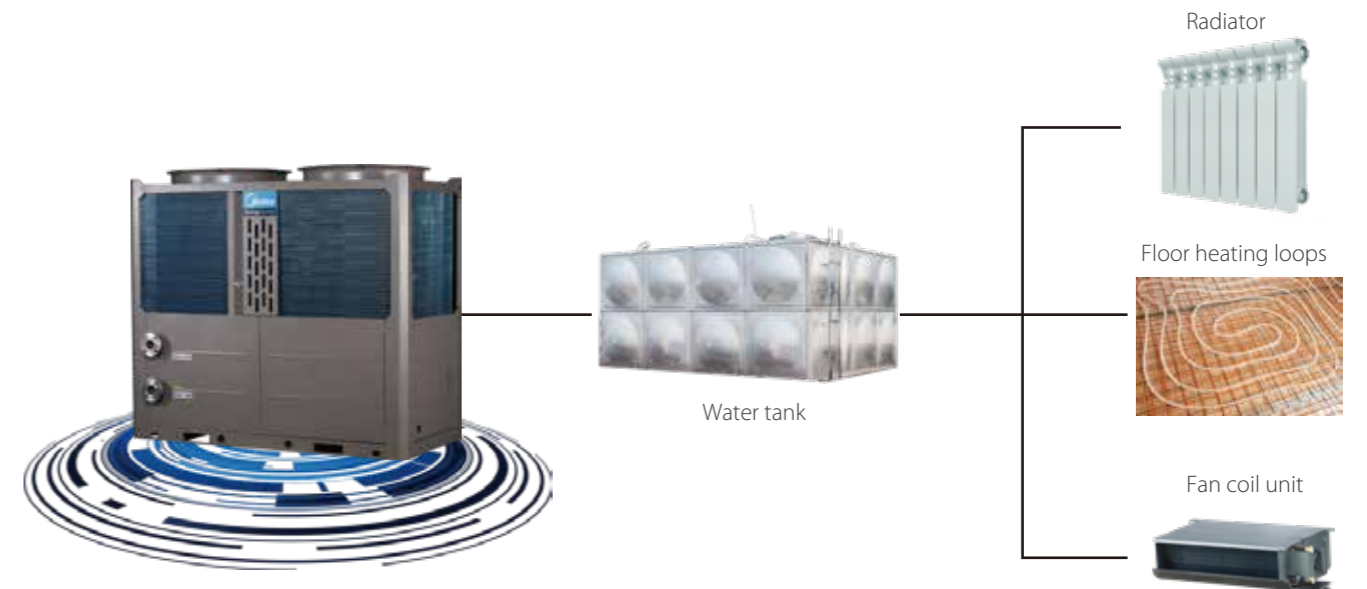
# Direct Heating Commercial Water Heater



## Product lineup

Model	120	200	420	800
Apperance Series				
220~240V-1Ph-50Hz	●			
380~415V-3Ph-50Hz		●	●	●

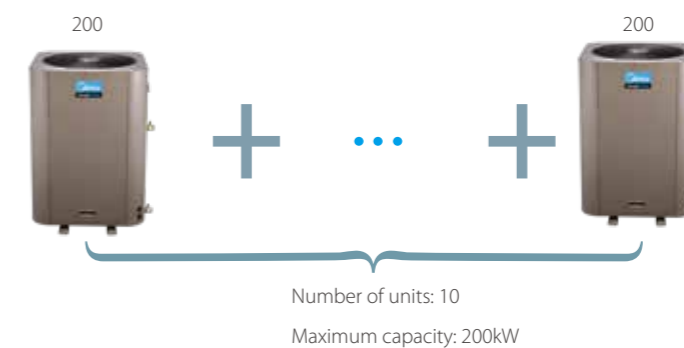
## Compatible with different kinds of terminals



## Features

### Wide application range

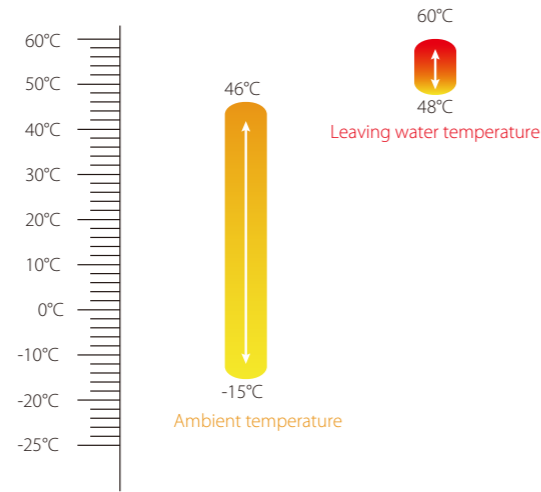
- 4 basic models with multiple power supply options;
- Free modular combination;
- Maximum 10 units combination(for 120/200 model) and controlled by one controller;
- Maximum 200kW combination capacity.





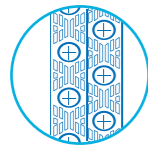
- ❖ Wide operation ambient temperature range.

Operates stably under extreme conditions, ranging from -15°C to 46°C.



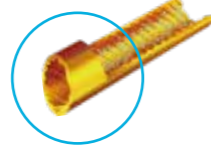
### High performance heat exchanger

Enlarge heat-exchanging area



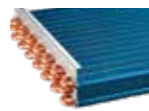
Fin

Enhance heat transfer



Inner-threaded pipe

High efficiency



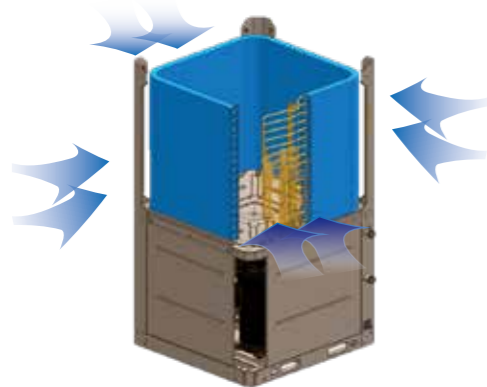
Fin + inner-threaded pipes

Hydrophilic film fins and inner-threaded copper pipes optimize heat exchange efficiency. The specially coated blue fins enhance durability and protect against corrosion from air, water and other corrosive agents, assures a longer coil service life.

#### Heat exchanger aluminum foil

> Standard products:  
200h of neutral salt mist

> Heavy anti-corrosion products:  
1000h of neutral salt mist  
140h of acid salt mis



#### Heat exchanger copper pipe

> Standard products:  
24h of neutral salt mist

> Heavy anti-corrosion products:  
150h of neutral salt mist

"G shape" air side heat exchanger(for 420 model);

360° air intake;

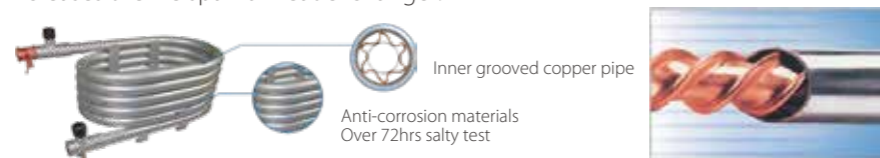
Increase the heat exchanging are

Efficiently enhance heat exchange efficiency

- ❖ High efficiency tube-in-tube heat exchanger

Inner grooved copper pipe, increased area of heat exchange, improved efficiency.

Anti-corrosion shell increases the life span of heat exchanger.



### Advanced technology

- ❖ Direct heating type

- ❖ Unique defrosting flow path.

Air side reserved special defrosting flow path, when the system is defrosting, the four-way valve is reversing, the system will absorb energy from special defrosting flow path, the defrosting progress will have no impact on water temperature.

- ❖ Electric water flow valve supplies hot water at a stable temperature and expands the life of compressor.

- ❖ Optimized fan blade edge by CFD programs with analyzing air pressure distribution.

- ❖ Reliable protections

Multiple protections are adopted to ensure system stable running.



High/low pressure protection of compressor



Power phases sequence protection



System high temperature protection



System anti-freezing protection in winter



Frequent compressor ON/OFF protection



Over-current protection of compressor



Discharge temperature protection of compressor



Water flow protection



Sensor malfunction protection

### Easy control

#### Wired controller



Model	KJR-51/BMKE-A
Appearance	
Main Functions	Touch key operation Parameter setting an LCD display Real-time clock function Multiple timer Power-off memory function Modbus(Customized)
Max. connection PCBs	16

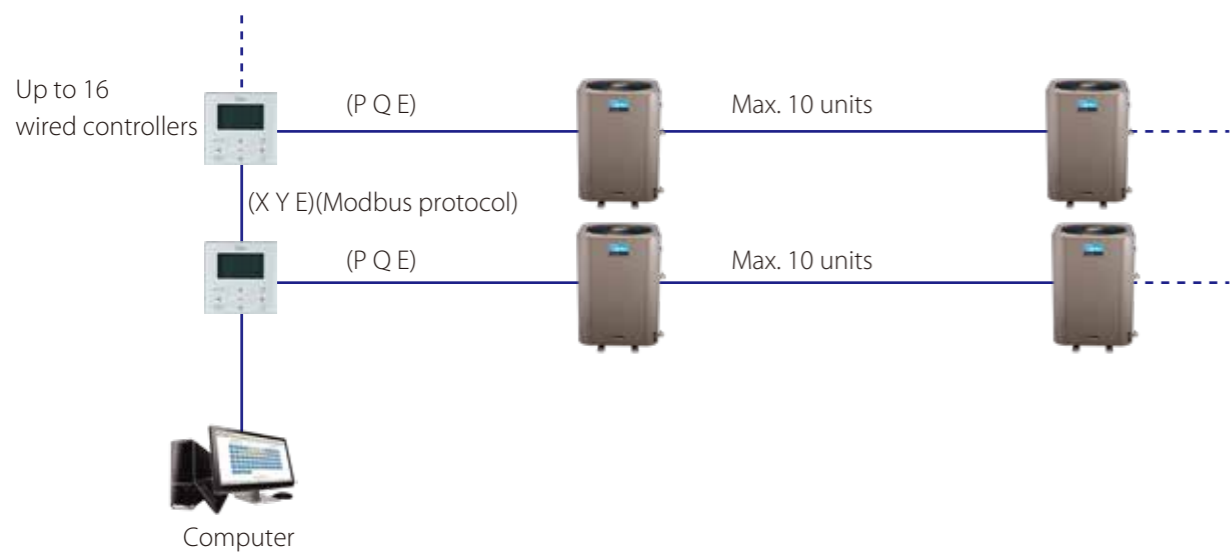
### Group control

Group control for up to maximum 10 units(for 120/200 models) with one wired controller.



### Modbus function

Modbus is an open protocol that is widely used, especially in BMS building control systems. Modbus function can be customized by adding X, Y, E ports on wired controller. It can connect Max. 16 wired controllers and each controller can control Max. 10 units.



### Remote control functions for convenient operation.

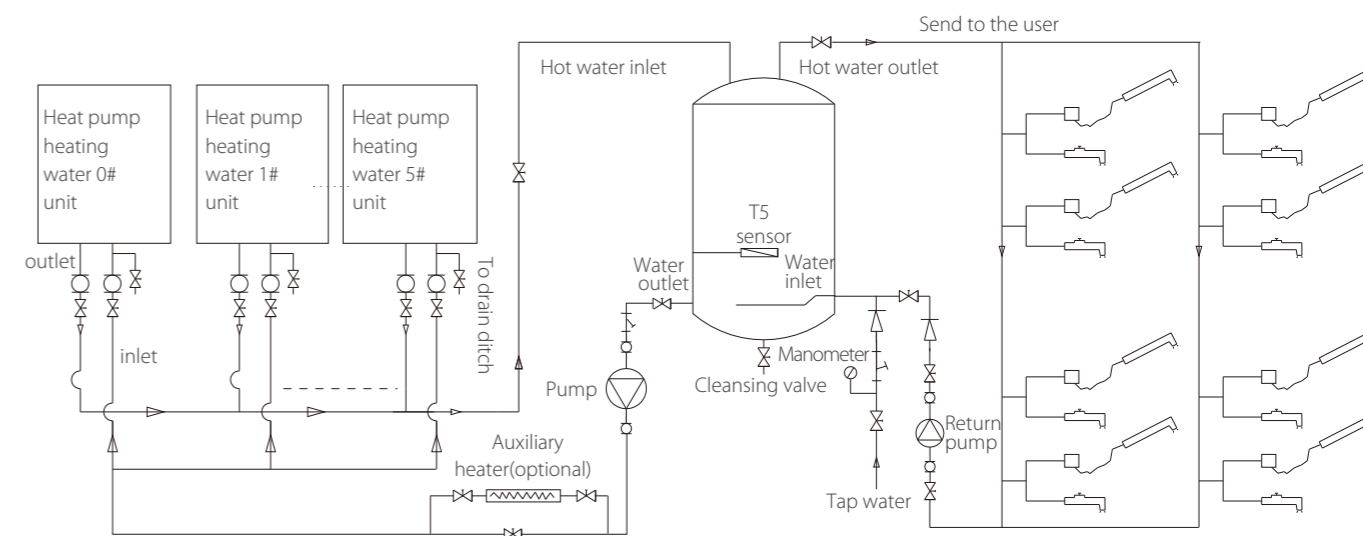
There are ON/OFF, Alarm terminals ports on PCB, connect switches from these terminal ports and remote control functions can be easily realized.



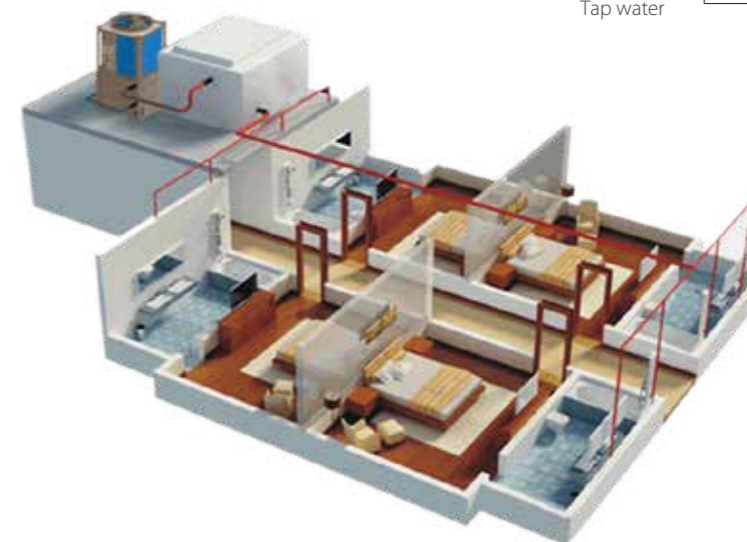
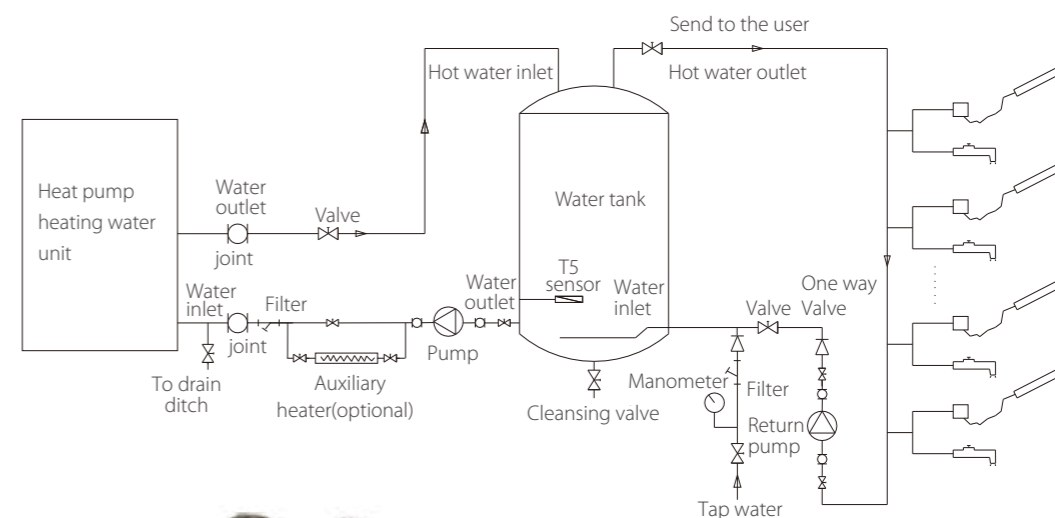
Note: When use the remote control function, the wired controller will be invalid for OFF and mode selection.

### Simple refrigerating system diagram

#### Parallel connected heat pump system



#### Single connected heat pump system



## Specifications

Model			RSJ-120/ZN1-540V1	RSJ-200/SZN1-540V1
Power supply		V/Ph/Hz	220-240/1/50	380-415/3 / 50
Ambient temperature range		°C	-15~46	-15~46
LWT setting range		°C	48~60	
Water Heating	Capacity	kW	11.8	20.4
	Input	kW	2.95	5.23
	COP			4.00
Unit dimension (W×H×D)		mm	790×1100×810	790×1100×810
Packing dimension (W×H×D)		mm	860×1220×885	860×1220×885
Net/Gross weight		kg	125/145	157/172
Outdoor noise level		dB(A)	59	63
Max. combination quantity		Pieces	6	6
Compressor	Type		Scroll	Scroll
	Quantity	Pieces	1	1
Fan motor	Type		AC motor	AC motor
	Quantity	Pieces	1	1
Air side heat exchanger	Type		Fin-coil	Fin-coil
Water side heat exchanger	Type		Tube-in-tube	Tube-in-tube
Refrigerant	Refrigerant Type /Quantity	kg	R410A/1.55	R410A/2.9
	Throttle type		Electric expansion valve	
Water pipe	water inlet pipe	mm	DN25	DN25
	water outlet pipe	mm	DN25	DN25
Hot Water Yield <sup>3</sup>		m <sup>3</sup> /h	0.25	0.45

## Remark:

1. Outdoor air temperature 20°C DB, 15°C WB; Water inlet 15°C, Water outlet 55°C.
2. The specifications may be changed for product improvement, please refer to the nameplate.
3. The value is calculated based on the capability value and capability test condition.

## Specifications

Model			RSJ-420/SZN1-H	RSJ-800/SZN1-H
Power supply		V/Ph/Hz	380-415/3 / 50	380-415/3 / 50
Ambient temperature range		°C	-15~46	-15~46
LWT setting range		°C	48~60	
Water Heating	Capacity	kW	39.0	80.0
	Input	kW	9.65	20.00
	COP			4.04
Unit dimension (W×H×D)		mm	1015×1775×1026	1995×1770×1025
Packing dimension (W×H×D)		mm	1070×1900×1030	2080×1895×1120
Net/Gross weight		kg	323/343	599/627
Outdoor noise level		dB(A)	66	68
Max. combination quantity		Pieces	4	2
Compressor	Type		Scroll	Scroll
	Quantity	Pieces	1	2
Fan motor	Type		AC motor	AC motor
	Quantity	Pieces	1	2
Air side heat exchanger	Type		Fin-coil	Fin-coil
Water side heat exchanger	Type		Tube-in-tube	Tube-in-tube
Refrigerant	Refrigerant Type /Quantity	kg	R410A/4.5	R410A/2×4.4
	Throttle type		Electric expansion valve	
Water pipe	water inlet pipe	mm	DN32	DN50
	water outlet pipe	mm	DN32	DN50
Hot Water Yield <sup>3</sup>		m <sup>3</sup> /h	0.85	1.72

## Remark:

1. Outdoor air temperature 20°C DB, 15°C WB; Water inlet 15°C, Water outlet 55°C.
2. The specifications may be changed for product improvement, please refer to the nameplate.
3. The value is calculated based on the capability value and capability test condition.