



# M thermal Arctic Series Introduction



- **What is M thermal Arctic Series**
- **Lineup**
- **Main features**
- **Easy Installation and Service**





# What is M thermal Arctic Series

# One-stop solution



- 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.


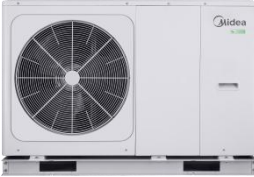








# Lineup

# Mono & Split



Capacity(KW)	4	6	8	10	12	14	16	18	22	26	30
Mono											
220~240-1Ph	●	●	●	●	●	●	●				
380~415-3Ph					●	●	●	●	●	●	●

	Outdoor unit						Indoor unit			
Capacity(KW)/Model	4	6	8	10	12	14	16	60	100	140
Split										
220~240-1Ph	●	●	●	●	●	●	●	●	●	●
380~415-3Ph					●	●	●			

# Mono



Capacity(KW)	4	6	8	10	12	14	16	18	22	26	30
Appearance											
220~240-1Ph	●	●	●	●	●	●	●				
380~415-3Ph					●	●	●	●	●	●	●

- Wide capacity range from 4~30kW
- Multiple power supply option
- Single fan structure design for 8~16kW models



Capacity(KW)/Model	Outdoor unit						Indoor unit			
	4	6	8	10	12	14	16	60	100	140
Appearance										
220~240-1Ph	●	●	●	●	●	●	●	●	●	●
380~415-3Ph					●	●	●			

- Wide capacity range from 4~16kW
- Multiple power supply option
- Thin design for hydronic box (width 270mm only)



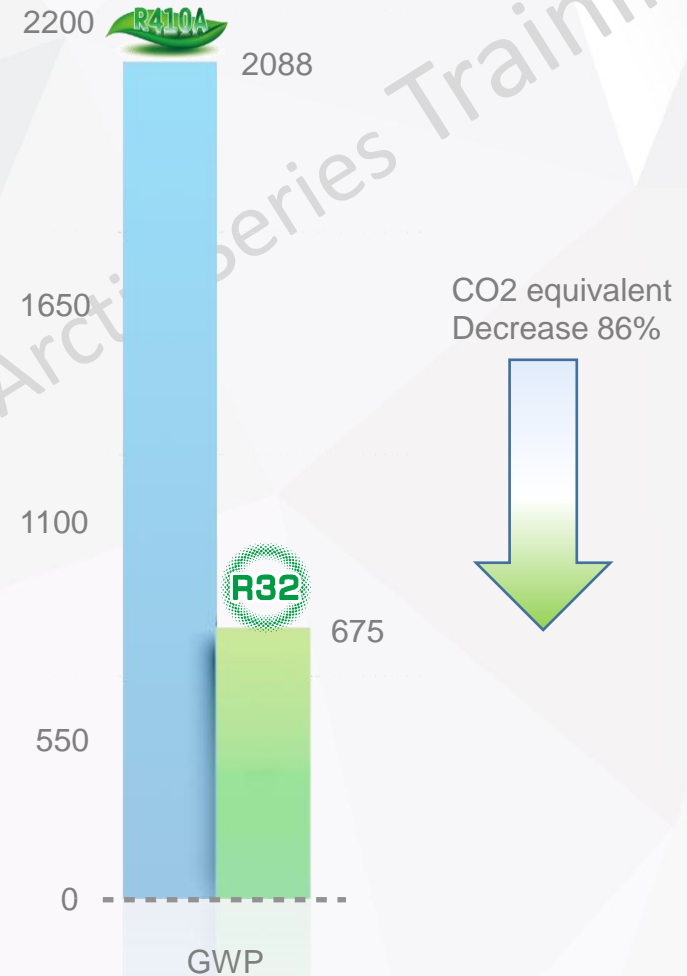
Thinnest 270mm



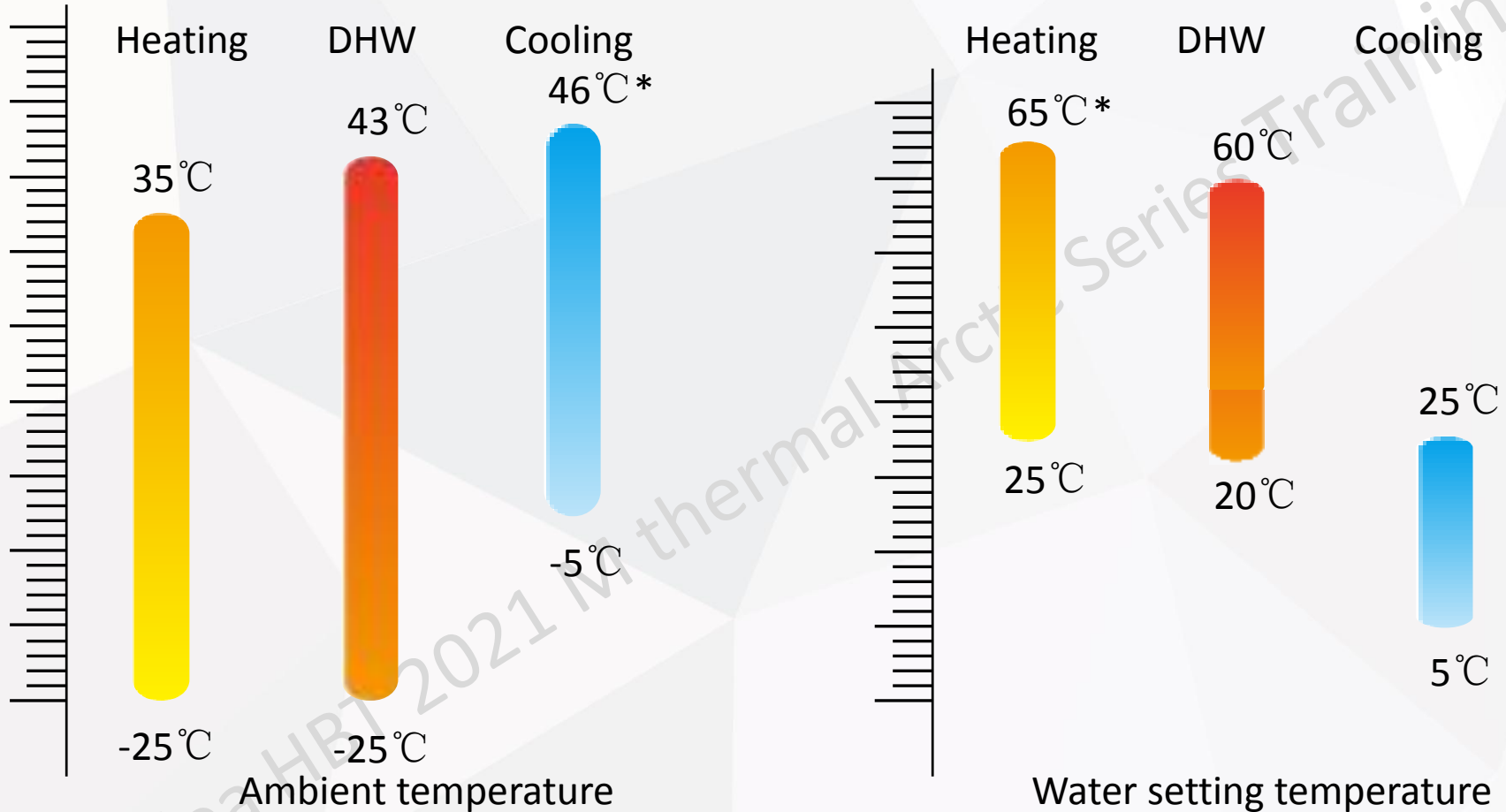
# R32 refrigerant



- **Friendly environment refrigerant R32**  
Lower GWP 675 (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
- **Less cost**  
Easier to get  
Less charged volume



# 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 maximum water temperature for heating mode is 60°C.

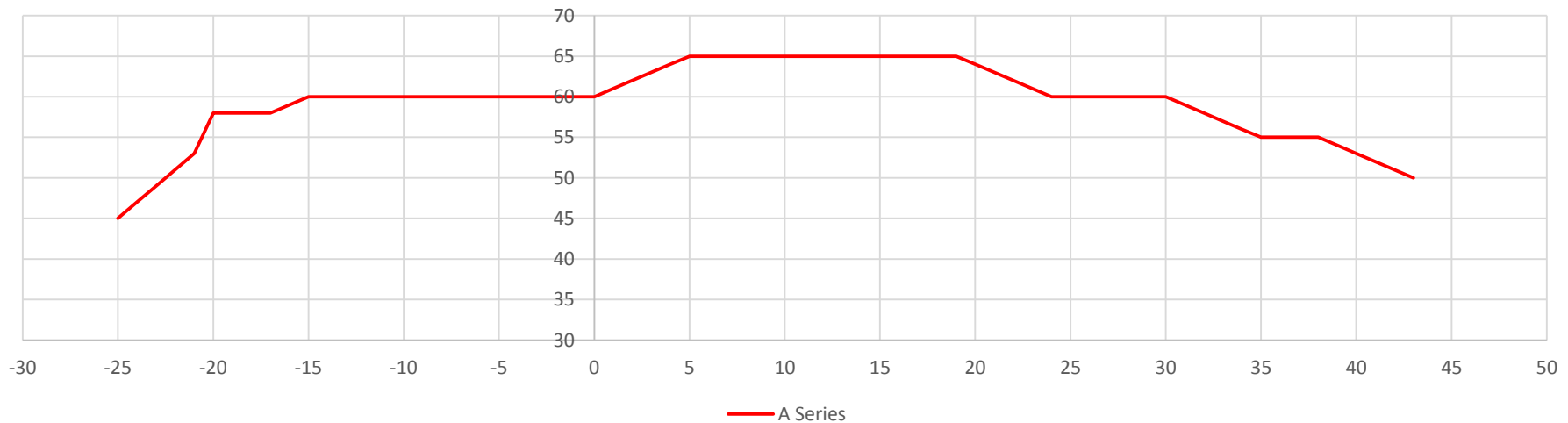
# Powerful heating



For Mono 4~16kW & Split

- Maximum 65°C leaving water temperature for heating mode
- Water temperature is up to 60°C at -15 °C ambient temperature

Maximum leaving water temp for heating





# Main features



# Main features

- High Efficiency
- High Reliability
- Comfort and health
- Convenient
- Smart control



# High Efficiency

# DC Inverter Technology

All DC Design



## DC Inverter compressor

- CE certification
- Wide working frequency
  - High efficiency
  - Six poles
  - Insulation grade E
- Twin eccentric cams
  - 2 balance weights
  - Better balance
  - Low vibration
- Spray liquid cooling control
  - Decrease discharge temperature
  - High reliability
- Compact structure
  - Highly robust bearings
  - Highly stable moving parts



# DC Inverter Technology

All DC Design



## DC inverter fan motor

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





# DC Inverter Technology

All DC Design



## DC Inverter water pump\*

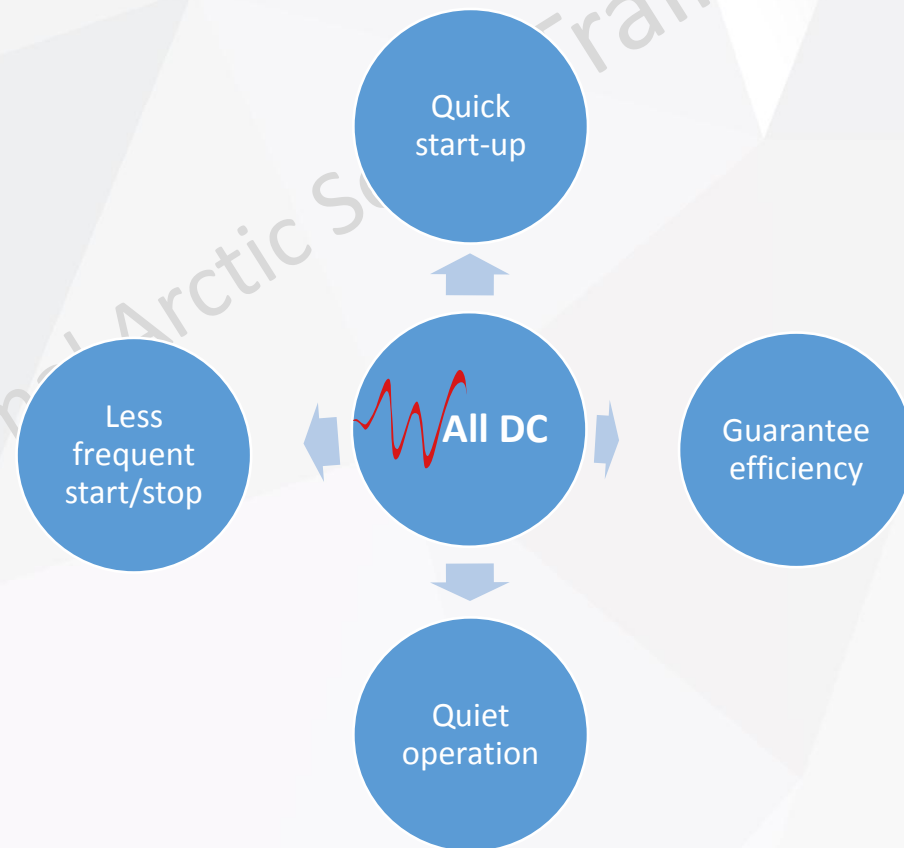
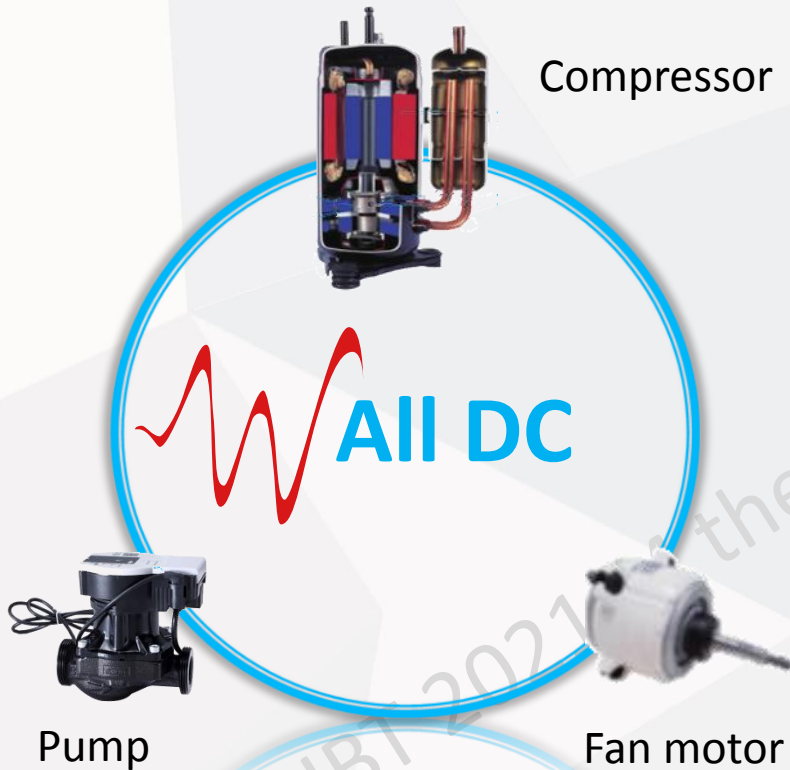
- CE certification
- High efficiency
- Big pump head
- Insulation grade F
- Level of protection IPX4D



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

# DC Inverter Technology

All DC Design



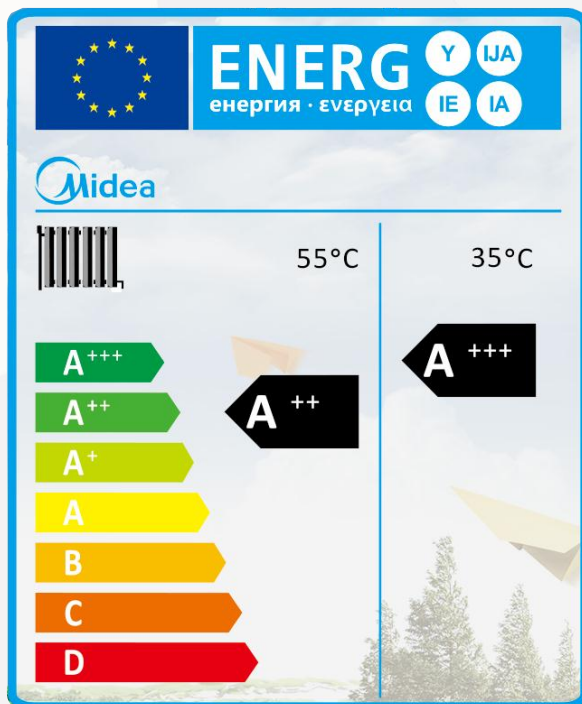
# Complete certification

Fulfill local legislation



# Complete certification

Fulfill local legislation



ERP Directive\*

ηs. Seasonal space heating energy efficiency

ηs average up to A+++ at 35° C

ηs average up to A++ at 55° C

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



# High Reliability

# Floor protection

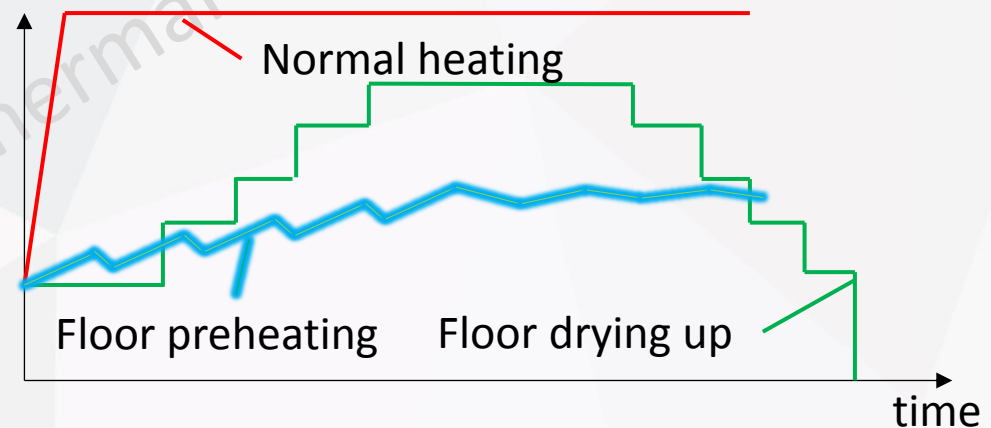


Preheating and drying up for floor

- Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation.
- Floor drying up mode and preheating mode protect floor from warping or even rupturing.



Leaving water temp.



# Power limitation function



- 9 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.

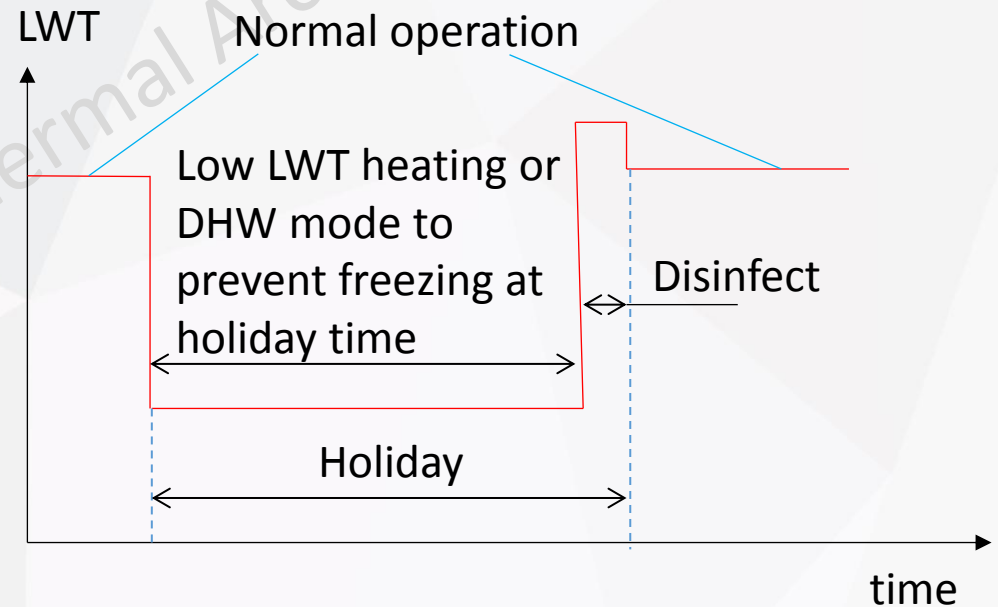




# Holiday away



- When the user goes on vacation the holiday away function can be used to protect the unit from freeze damage according to the climate.
- When the holiday away function is activated the unit will run in heating or DHW mode with low set temp in the set period.







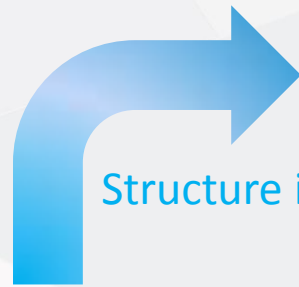
# Comfort & Health

# Extremely silent



## Structure innovation ensures lower noise

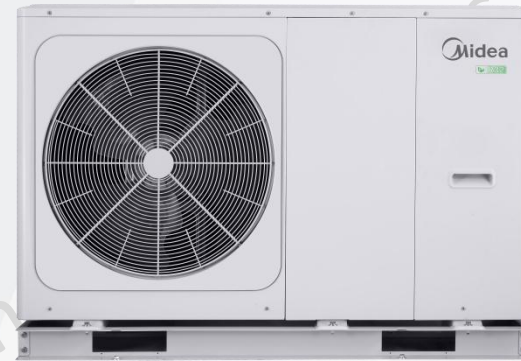
- Single fan compact structure design for big capacity outdoor unit with lower noise.



Structure innovation



Twin fans structure for Eco Series Mono 12~16kW



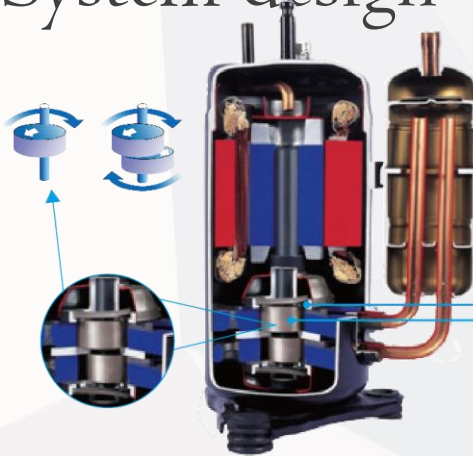
Single fan structure for Arctic Series Mono 12~16kW

Erp sound power level gratefully reduces for 6dB!

# Extremely silent



## System design



### Better balance and extremely low vibration:

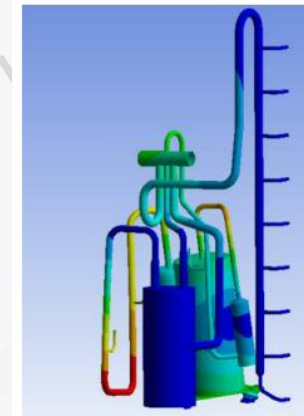
- Twin eccentric cams
- 2 balance weights

### Highly stable moving parts:

- Optimize compressor drive technology
- Highly robust bearings
- Compact structure

### Modal analysis

### Harmonic response analysis

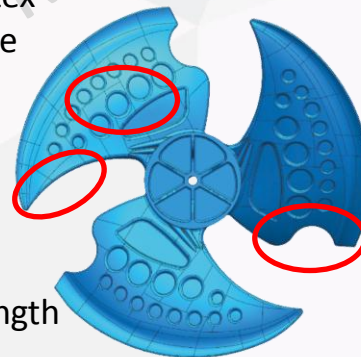


### Suction surface concave design

Reduce the size of wake shedding vortex  
Improve the flow field on blade surface  
Reduce weight and improve efficiency

### Leading edge thickening design

Reduce low frequency noise  
Effectively improve the blade strength



### Trailing edge notch design

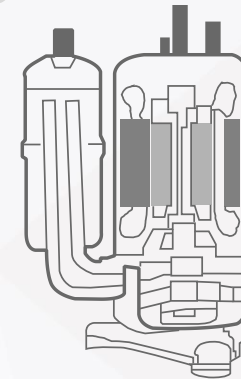
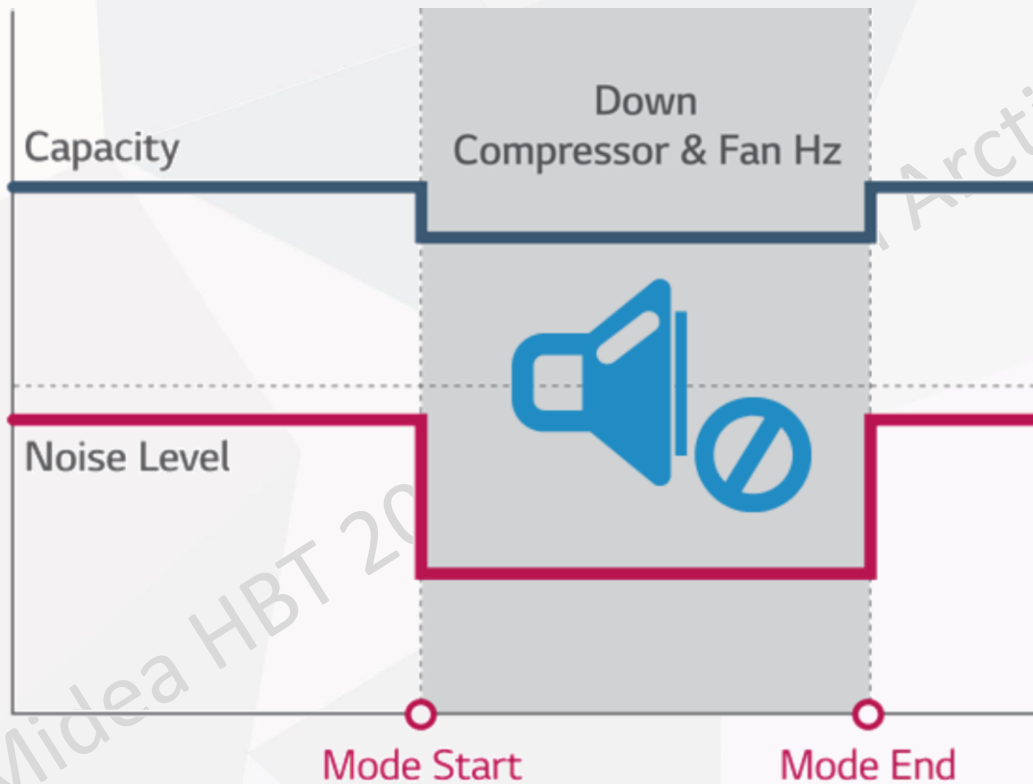
Change pressure distribution in the trailing edge of the blade  
Reduce the noise of blade

# Extremely silent



## Silent mode

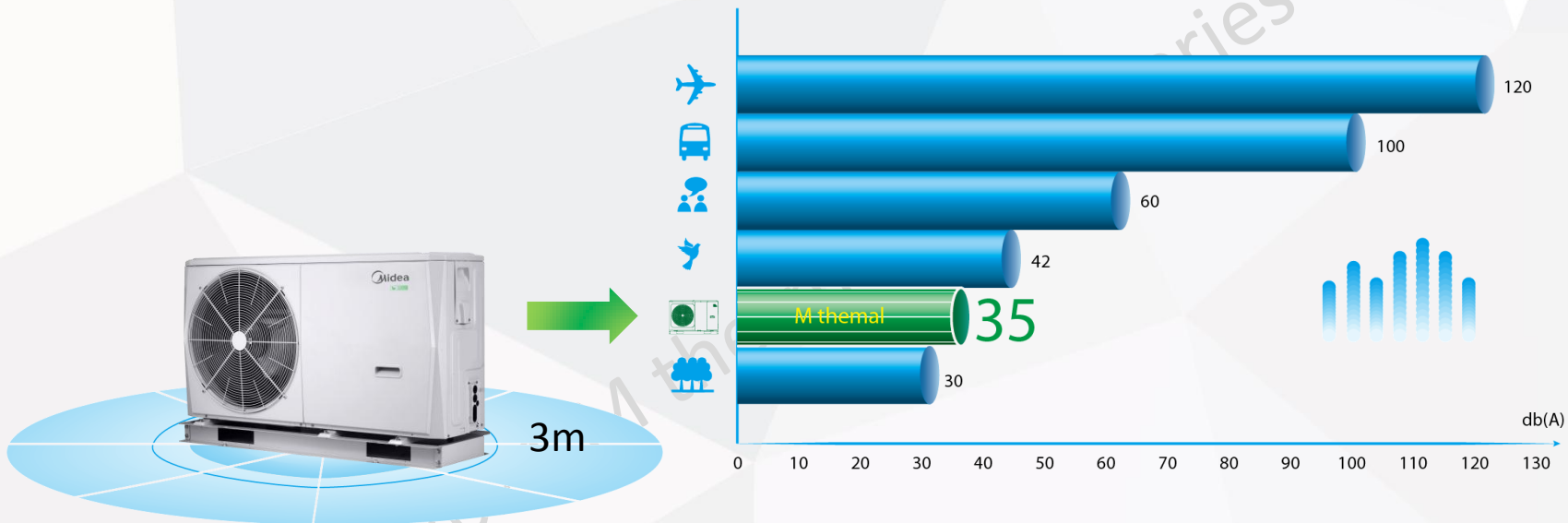
- Two levels of silent mode
- Level 2 is more quiet than level 1.



# Extremely silent



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



Test condition:

1. Evaporator air in 7 °C , 85% R.H., Condenser water in/out 30/35 °C
2. Condenser air in 35 °C . Evaporator water in/out 23/18 °C

# Extremely silent



## Water pump silent mode

- Water pump maximum output decreases 5% to decrease the noise of heat pump.

15 INPUT DEFINE	
15.11 PUMPI SILENT MODE	NON
ADJUST	

# Fast DHW

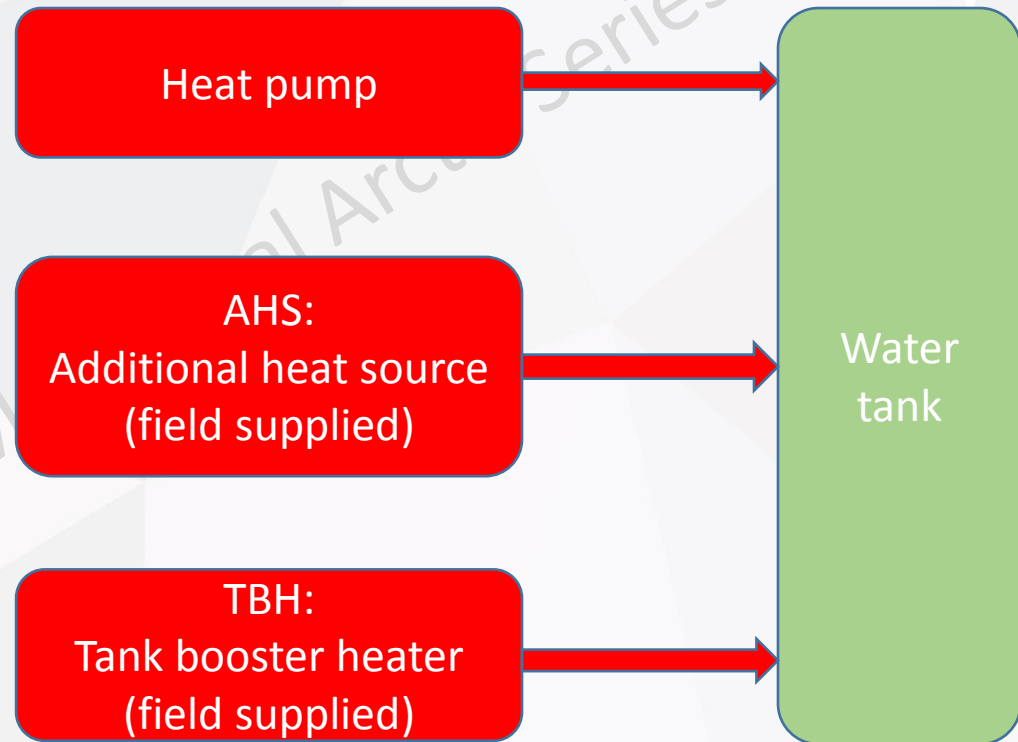


## Quick response

- Provide hot water in a short time

DOMESTIC HOT WATER (DHW)			
DIS-INFECT	FAST DHW	TANK HEATER	DHW PUMP
CURRENT STATE			ON
ON/OFF ON/OFF			

DOMESTIC HOT WATER (DHW)			
DIS-INFECT	FAST DHW	TANK HEATER	DHW PUMP
CURRENT STATE			ON
ON/OFF ON/OFF			



# DWH PUMP Function

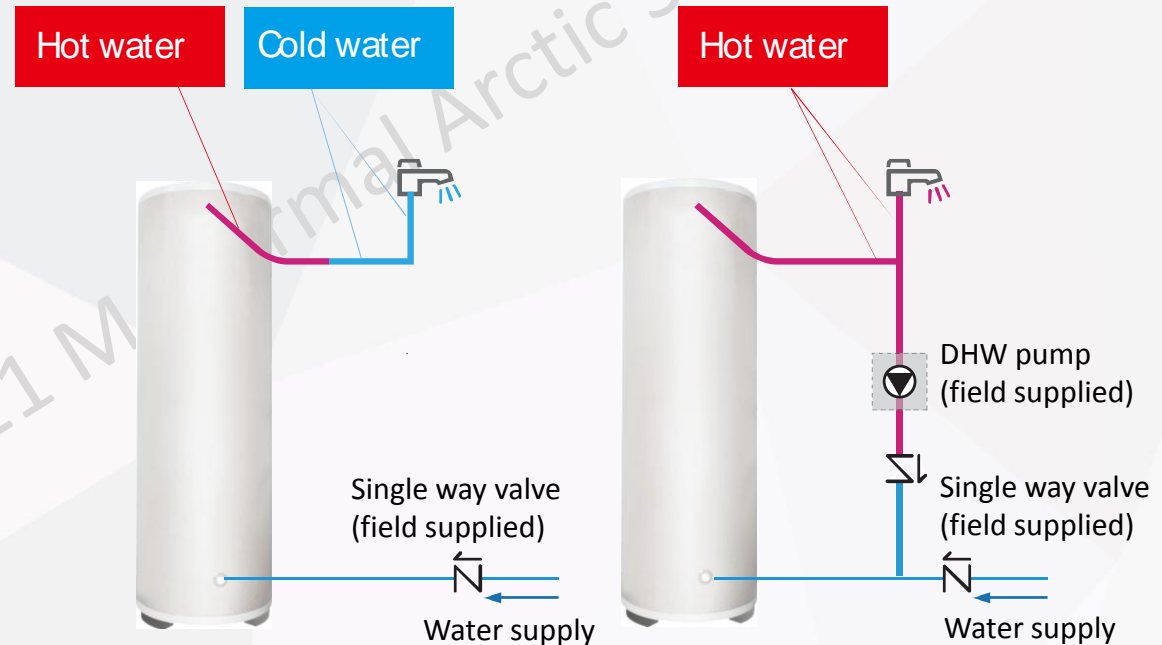


## Enhance comfort

- The DWH 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.

DOMESTIC HOT WATER (DHW) 1/2			
DIS-INFECT	FAST DHW	TANK HEATER	DHW PUMP
NO.	START	NO.	START
T1 <input type="checkbox"/>	00:00	T4 <input type="checkbox"/>	00:00
T2 <input type="checkbox"/>	00:00	T5 <input type="checkbox"/>	00:00
T3 <input type="checkbox"/>	00:00	T6 <input type="checkbox"/>	00:00

DOMESTIC HOT WATER (DHW) 2/2			
DIS-INFECT	FAST DHW	TANK HEATER	DHW PUMP
NO.	START	NO.	START
T7 <input type="checkbox"/>	00:00	T10 <input type="checkbox"/>	00:00
T8 <input type="checkbox"/>	00:00	T11 <input type="checkbox"/>	00:00
T9 <input type="checkbox"/>	00:00	T12 <input type="checkbox"/>	00:00



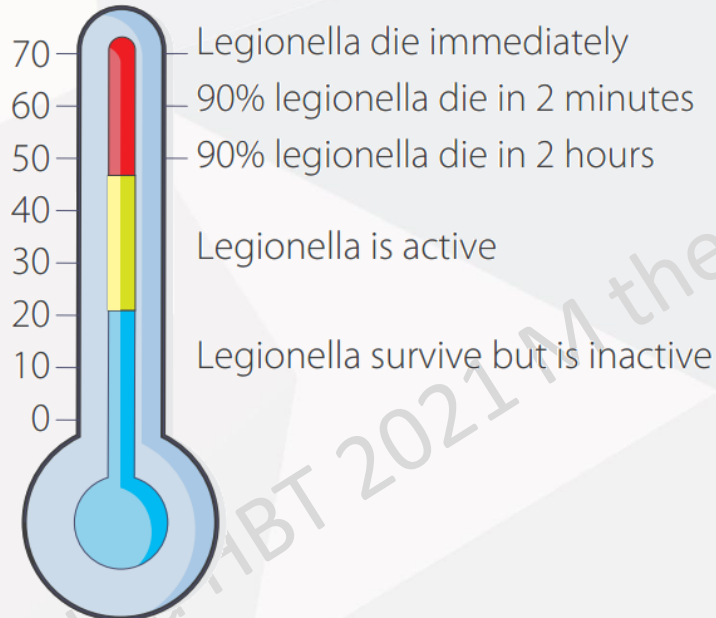


# Disinfect

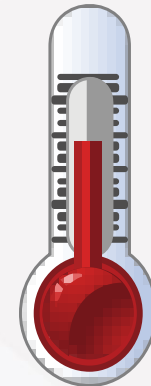


## Ensure healthy life

- Disinfect function is used to kill legionella by 70 °C water to ensure the health and safety. This function can be activated by the user interface.



DOMESTIC HOT WATER (DHW)			
DIS- INFECT	FAST DHW	TANK HEATER	DHW PUMP
CURRENT STATE			ON
OPERATE	DAY	FRI	
START	23:00		
ON/OFF ON/OFF			



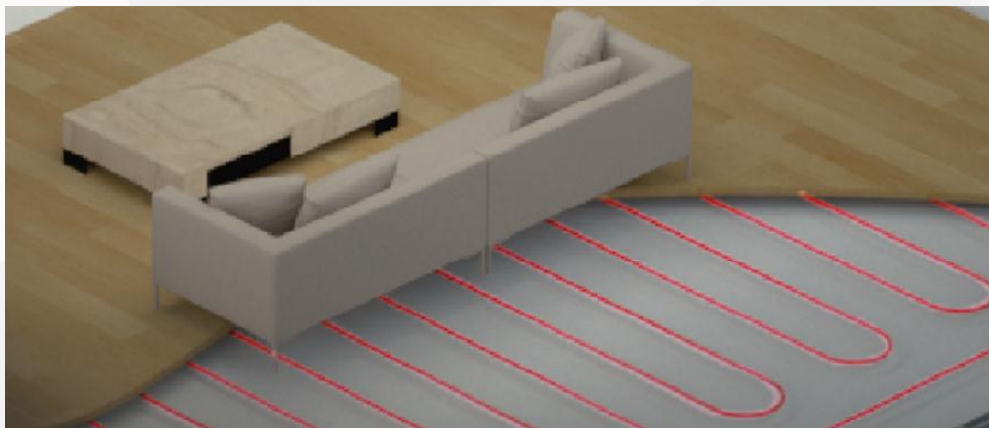
70 °C

# Floor heating function



## Comfort life

- M thermal can be used for floor heating by connecting floor heating loops to the unit. Floor heating is the most comfortable heating method.

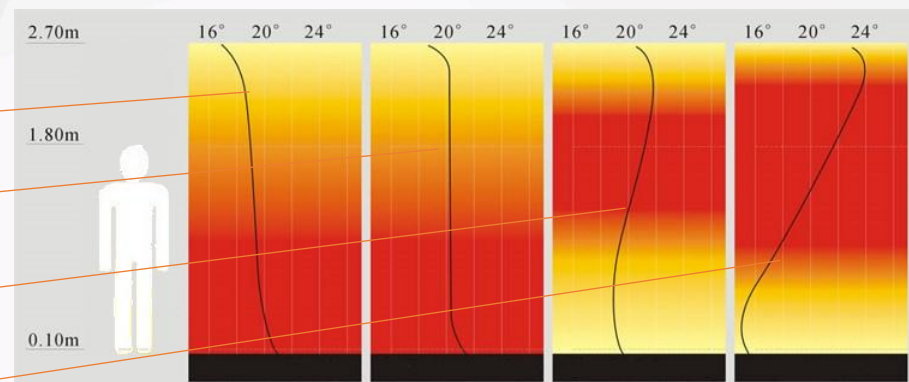


Ideal heating curve

Floor heating curve

Radiator heating curve

Air conditioner heating curve





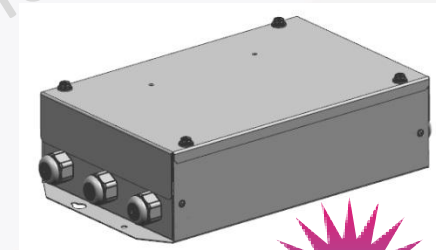
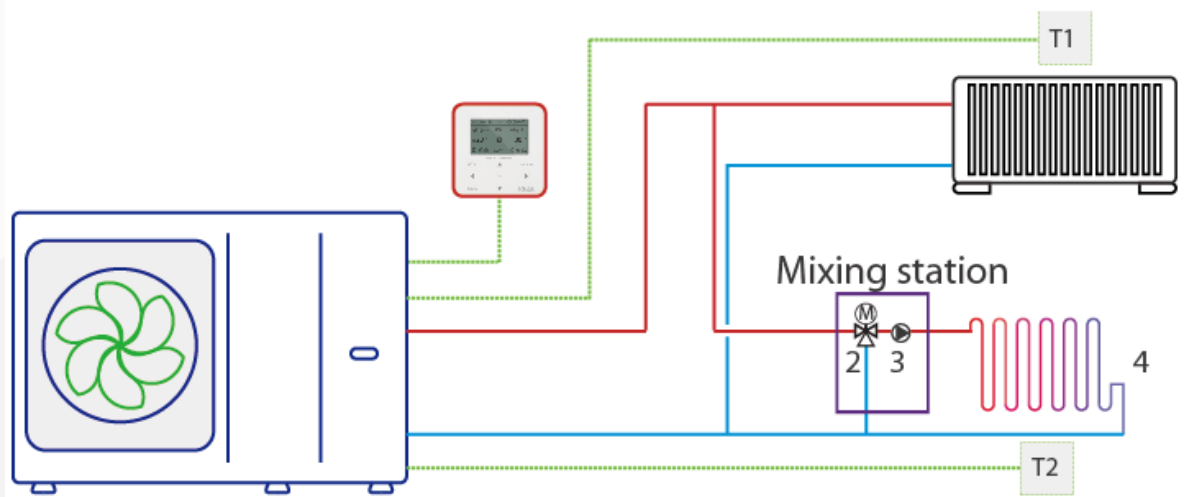
# Convenient

# Double zones control



## Flexible control

- Double zones control function is used to ensure different indoor terminal units working at its design temperature to enhance the comfort and save energy.



M-kit



- ✓ When the temp. of Zone1 is reached, the water pump stops but the M thermal unit keeps running.
- ✓ When temp. of Zone1 and Zone2 are both reached and no DHW requirement, the M thermal unit will stop.
  - Adapter board kit “M-kit” is optional. Maximum 16 thermostats are available to control heat pump.

# Schedule



## Intelligent control

- Schedule functions(daily schedule and weekly schedule) makes the control of unit more simple for the end user. The daily schedule and weekly schedule can not be activated at the same time.
- Total 6 timers for one day can be set.

SCHEDULE					1/2
TIMER	WEEKLY SCHEDULE	SCHEDULE CHECK	CANCEL TIMER		
NO.	START	END	MODE	TEMP	
1	<input type="checkbox"/>	00:00	00:00	HEAT	0°C
2	<input type="checkbox"/>	00:00	00:00	HEAT	0°C
3	<input type="checkbox"/>	00:00	00:00	HEAT	0°C

Daily schedule

SCHEDULE						
TIMER	WEEKLY SCHEDULE	SCHEDULE CHECK	CANCLE TIMER			
MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENTER			CANCEL			
OK MON SELECT						

Weekly schedule

NO.	START	END	MODE	TEMP
T1	1:00	3:00	DHW	50°C
T2	7:00	9:00	HEAT	28°C
T3	11:30	13:30	COOL	20°C
T4	14:30	16:30	HEAT	28°C
T5	15:00	19:00	COOL	20°C
T6	18:00	23:30	DHW	50°C

Example for daily schedule

# Holiday home



## Humanized setting

- This function is used to control the heat pump without changing the daily schedule or weekly schedule when the user stay at home for vacation.

OPTIONS			
SILENT MODE	HOLIDAY AWAY	<b>HOLIDAY HOME</b>	BACKUP HEATER
<b>CURRENT STATE</b>			ON
FROM			15-08-2015
UNTIL			17-08-2015
TIMER			ENTER
<b>ON/OFF</b>	ON/OFF	<b>↕</b>	SCROLL

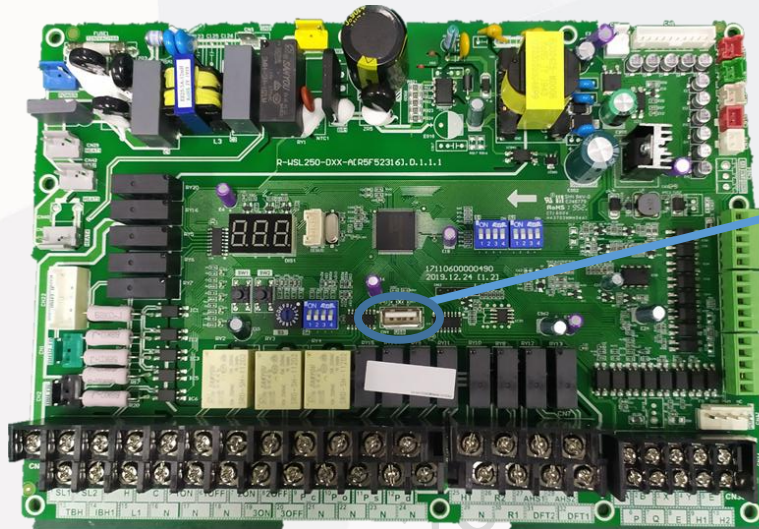
Period	Then...
Before and after your holiday	Your normal schedules will be used.
During your holiday	The configured holiday settings will be used.

# USB function



## Convenient for data transmission

- Parameter setting transmission between wired controllers
- Program upgrade





# Smart Control

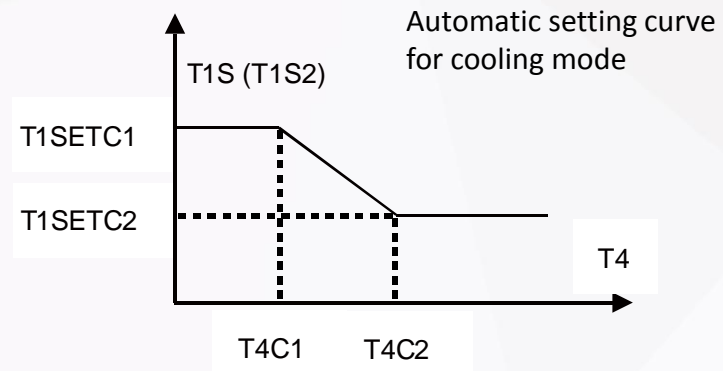
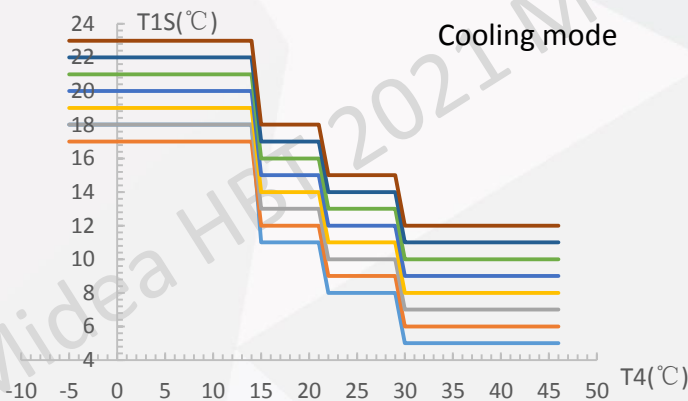
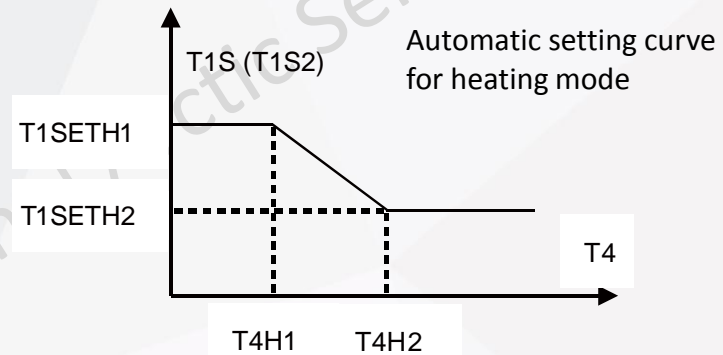
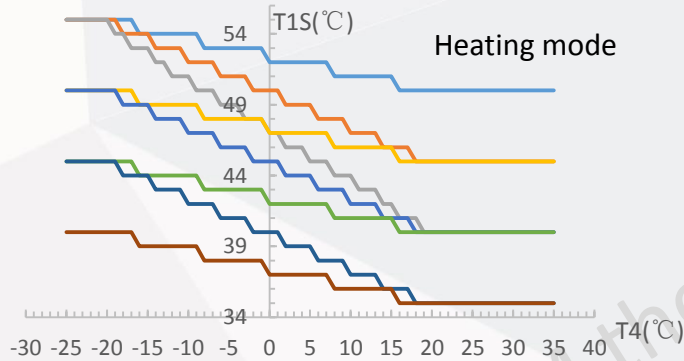


# Climate curves



## Automatic setting

- Water temperature automatically set according to ambient temperature.
- 32 weather temperature curve are already set by experienced engineer and customized curve are available, which meets the diversified requirements of temperature.



# Smart grid Function



## Energy saving

- SG Ready is a Smart Grid certification for heat pumps in Germany.
- The grid will provide two signals(EVU, SG) to indicate the grid load. Heat pump with Smart Grid certification can identify different signals combination and adjust working state to adapts to the grid load to achieve energy saving.



EVU	SG	Control
ON	ON	DHW mode turn on and setting water tank temperature will change to 70°C. TBH turn on automatically when tank temperature is below 69 °C.
ON	OFF	DHW mode turn on. TBH turn on automatically when $T5 < T5S - 2$ and turn off when $T5 \geq T5S + 3$ .
OFF	ON	Normal operation according to customers' requirement.
OFF	OFF	Prohibit DHW and TBH operation. Heat pump runs for certain time(SG RUNNING TIME) and then turn off.

# Wifi controller



Integrated design of  
Wired controller and  
panel



## Main features

- Touch-key designed
- 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
- 12 languages

# WIFI controller and APP

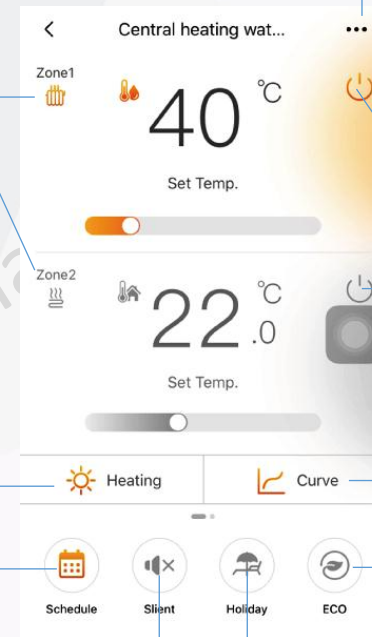


## Smart control

### MSmartLife APP



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



Terminal icon

Zone name setting  
Electric consumption setting

On/Off control

Mode setting

Temperature curve setting

Day timer  
Weekly timer

ECO mode

Silent mode  
Super silent mode

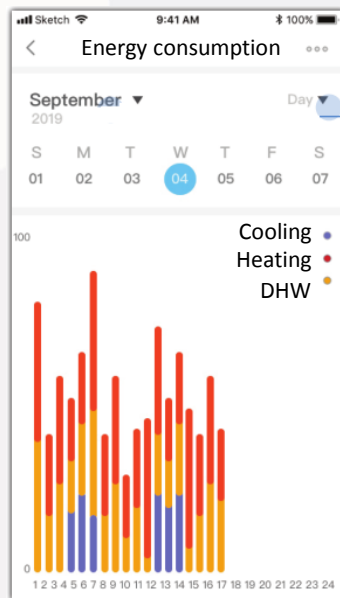
Holiday away mode  
Holiday home mode

# WiFi controller and APP

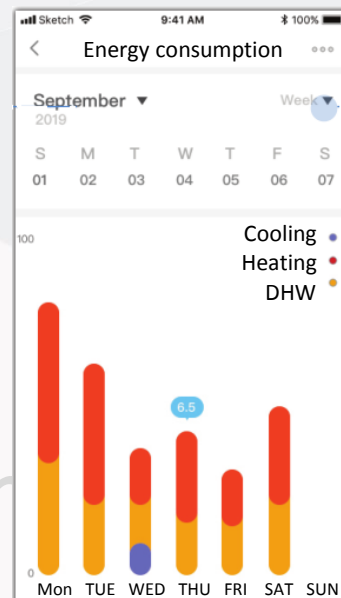


## Energy consumption and suggestion

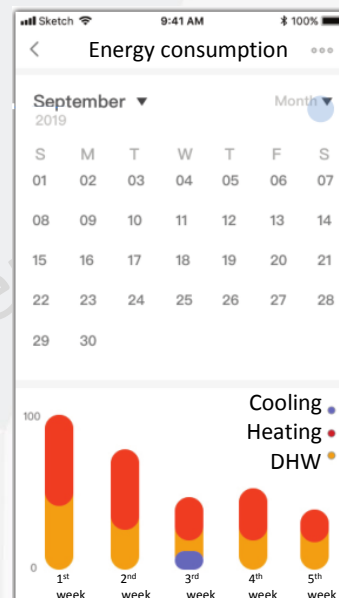
- M thermal unit can be controlled through APP and energy consumption can be displayed on APP.
- Energy-saving suggestion can be displayed on APP.



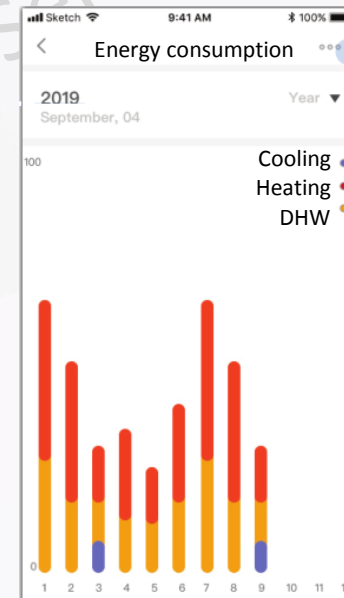
Daily energy consumption



Weekly energy consumption

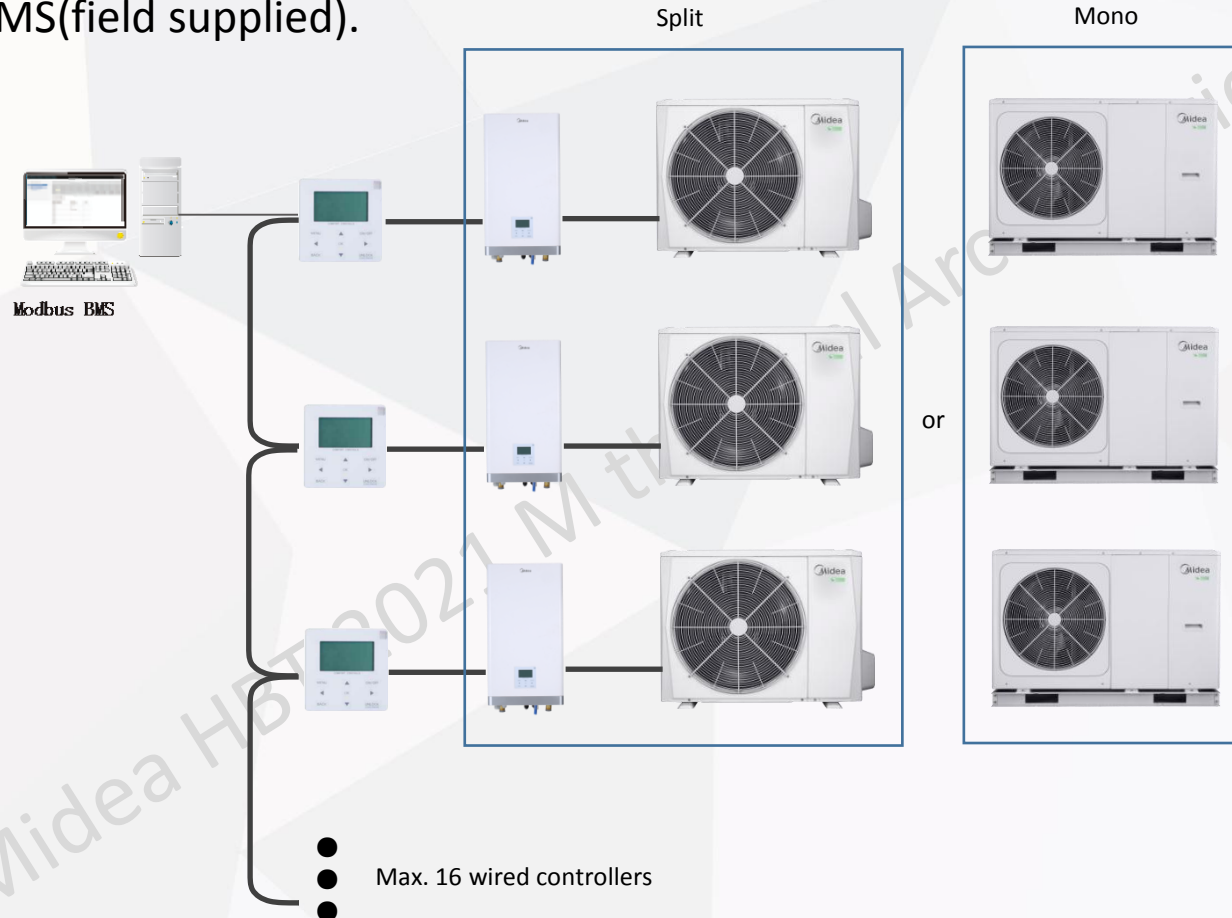


Monthly energy consumption



Yearly energy consumption

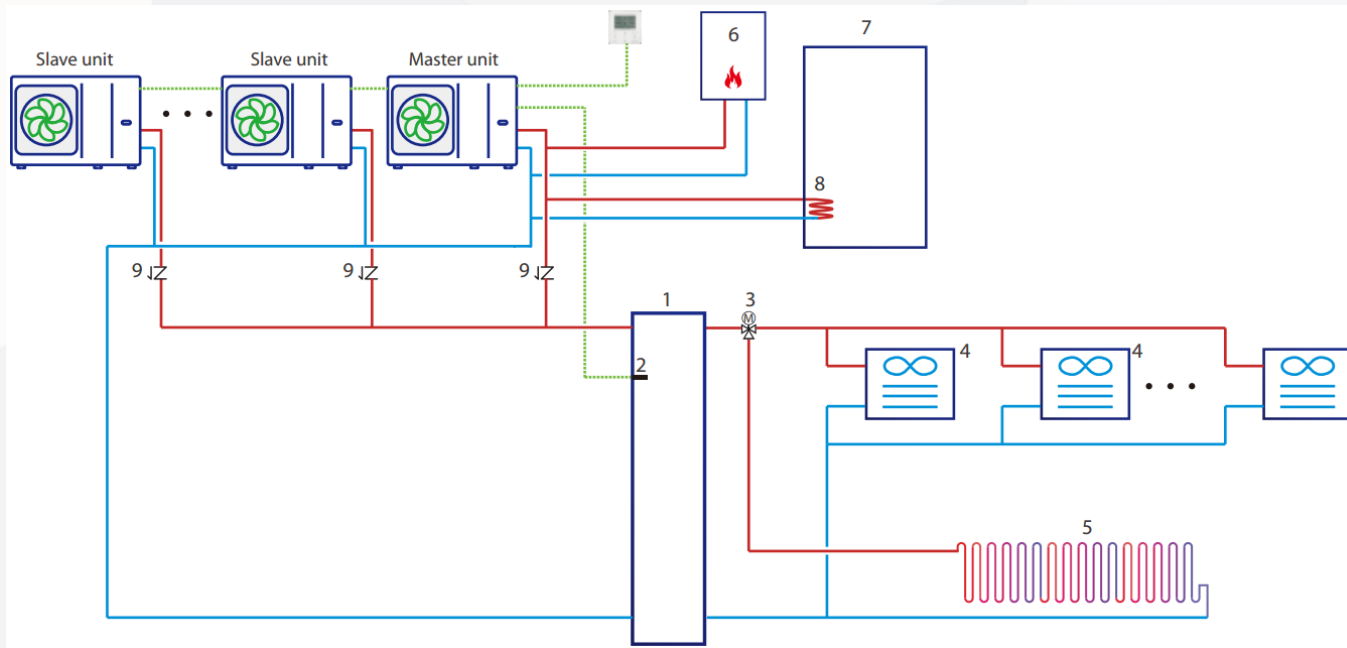
- With MODBUS RTU communication protocol, up to 16 units can be connected to BMS(field supplied).



# Cascade function



- Max 6 Mono units controlled by one controller with automatic addressing.



Note:

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.



# Easy Installation and Service

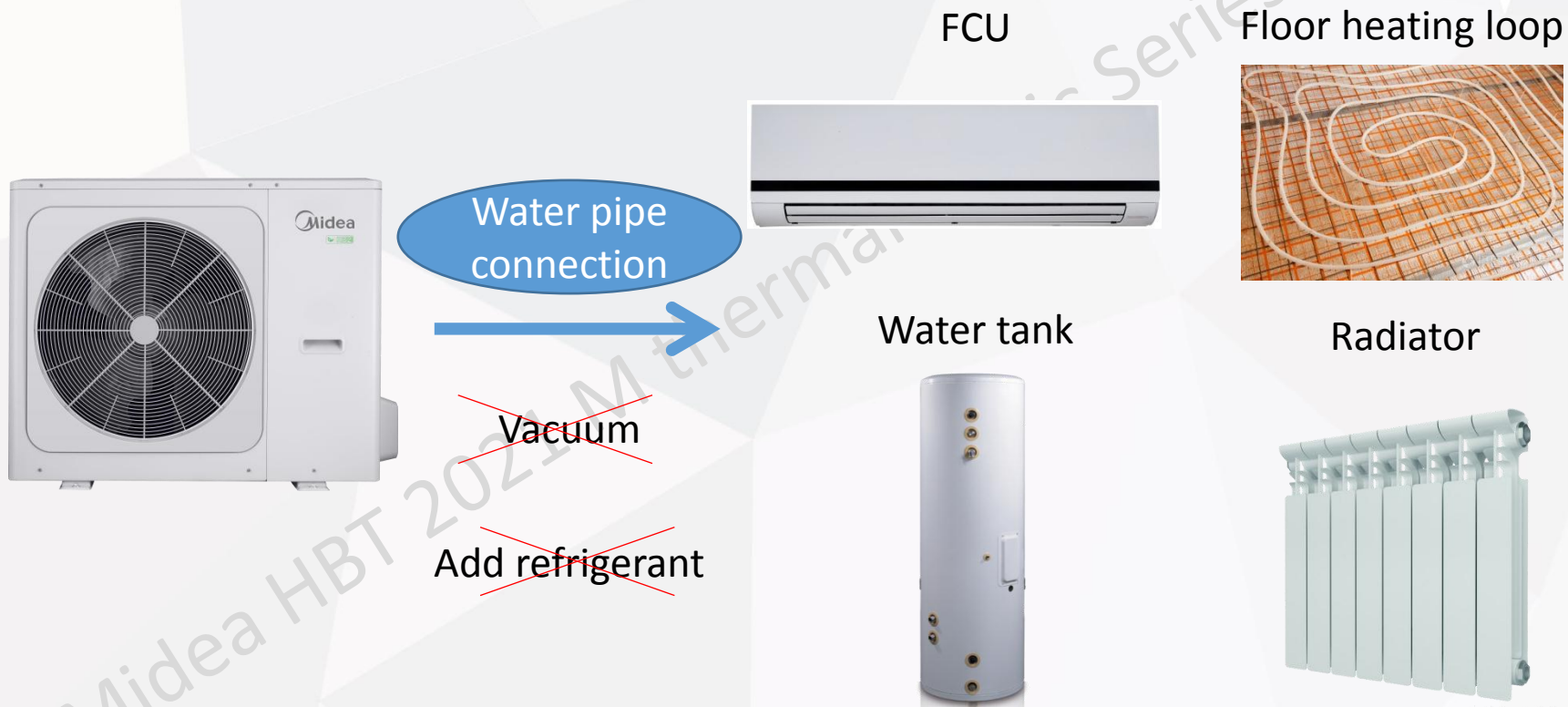


# Integrated structure



## High flexibility of installation

- Thanks to the mono structure, the capacity of compressor will not be affected by the distance and height difference between the heat pump and terminal units.



# Easy maintenance



- For Mono 4-6KW, 18~30kW model, the maintenance is very easy for only one front door need to be open to the internal components.

4~6kW model



Electrical parts



18~30kW model



Hydronic component



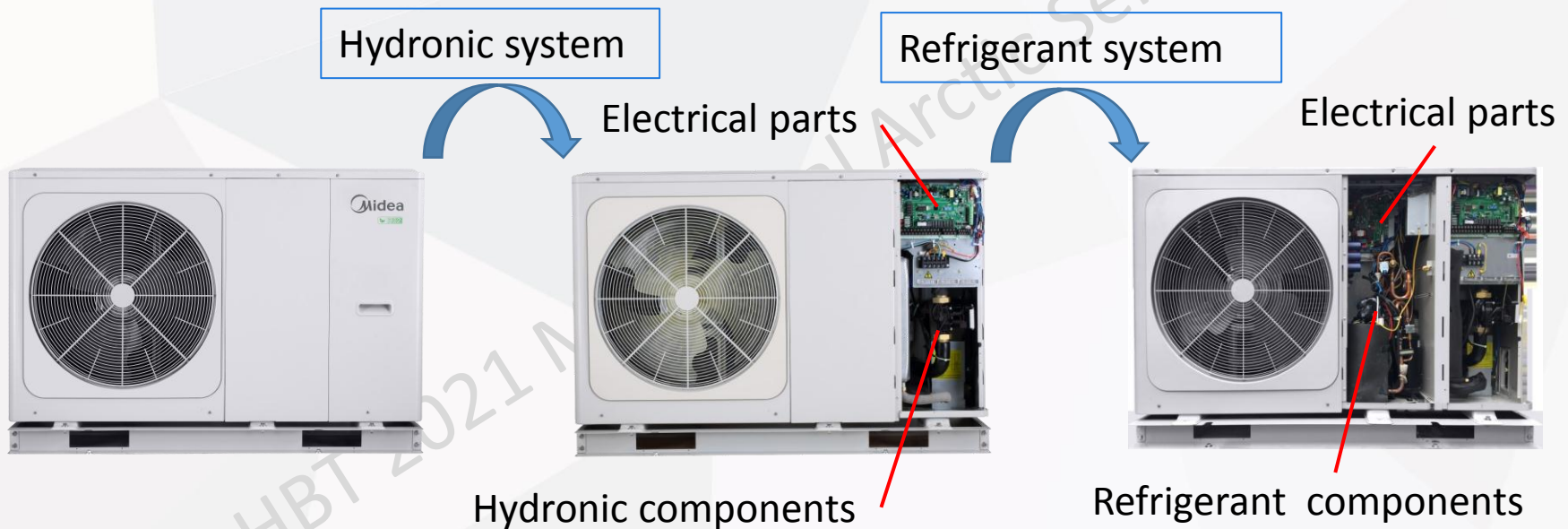
Refrigerant component



# Easy maintenance



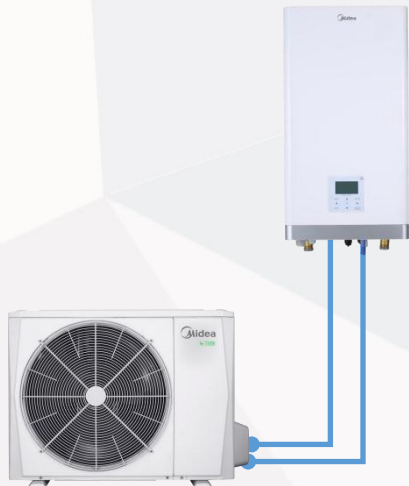
- For Mono 8-16KW models, there is one door for hydronic system maintenance and one door for refrigerant system.



# No additional refrigerant requirement



- Thanks to optimized design, the Split unit no need to add refrigerant when then refrigerant pipe length is less than 15 meters.



## Split 4/6kW models

- Pipe length < 15m, no additional refrigerant need
- At maximum pipe length 30m, no ventilation require



## Split 8/10kW models

- Pipe length < 15m, no additional refrigerant need
- Pipe length < 20m, no ventilation require

## Split 12/14/16kW models

- Pipe length < 15m, no additional refrigerant need or ventilation require

# Thin structure



## 270mm thinnest

- 270mm thinnest size in industry for hydronic box
- Ideal transformation plan for gas burner and convenient for replacing

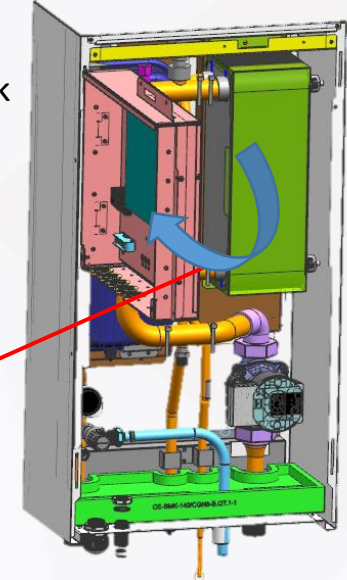


Electrical parts  
Anti-explosion design(Relay; Fuse)  
Ensure safety and reliability



Air cooling heatsink

Rotatable design  
Easy maintenance



Hydronic component



# Thank you