



Commercial Air Conditioners **2018/2019**



**M-Thermal Heat Pumps
Mono/Split**



Commercial Air Conditioner Division
Midea Group
Add.: Midea Headquarters Building, 6 Midea Avenue, Shunde, Foshan, Guangdong, China
Postal code: 528311
Tel: +86-757-26338346 Fax: +86-757-22390205
cac.midea.com global.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.



Midea CAC

Midea CAC is a key division of the Midea Group, a leading producer of consumer appliances and provider of heating, ventilation and air conditioning solutions. Midea CAC has continued with the tradition of innovation upon which it was founded, and emerged as a global leader in the HVAC industry. A strong drive for advancement has created a groundbreaking R&D department that has placed Midea CAC at the forefront of a competitive field. Through these independent efforts and joint cooperation with other global enterprises, Midea has supplied thousands of innovative solutions to customers worldwide.

There are three production bases: Shunde, Chongqing and Hefei.
MCAC Shunde: 38 product lines focusing on VRF, Split Products, Heat Pump Water Heaters, and AHU/FCU.
MCAC Chongqing: 14 product lines focusing on Water Cooled Centrifugal/Screw/Scroll Chillers, Air Cooled Screw/Scroll Chillers, and AHU/FCU.
MCAC Hefei: 11 product lines focusing on VRF, Chillers, and Heat Pump Water Heaters.

MIDEA GROUP
FORTUNE GLOBAL
FORTUNE
500
2016

Midea Company
Introduction



Midea CAC
Introduction



- 2016 >> Acquired 80% stake in Clivet.
Launched the new generation of M-Thermal products, including Mono and Split type.
- 2015 >> JV with Carrier in China in chiller field, BOSCH in VRF production and Siix in smart control.
- 2013 >> Launched combo type 300L products with enamel water tank.
- 2012 >> Introduced the professional production line EISENMAN from German.
- 2011 >> Launched the first generation of M-thermal products.
- 2010 >> Built the 3rd manufacturing base in Hefei.
- 2008 >> Launch the first generation of combo type products.
- 2007 >> Cooperated with GE to develop combo type air source heat pump.
- 2004 >> Launch the first generation of direct heating products.
- 2003 >> Entered the air source heat pump field and launched the first generation cycle heating products.
- 1999 >> Entered the CAC field.

Contents

- ❖ 04 Introduction
- ❖ 07 DC Inverter Technology
- ❖ 09 Overview
- ❖ 13 Features
- ❖ 20 Typical Applications
- ❖ 31 Specifications

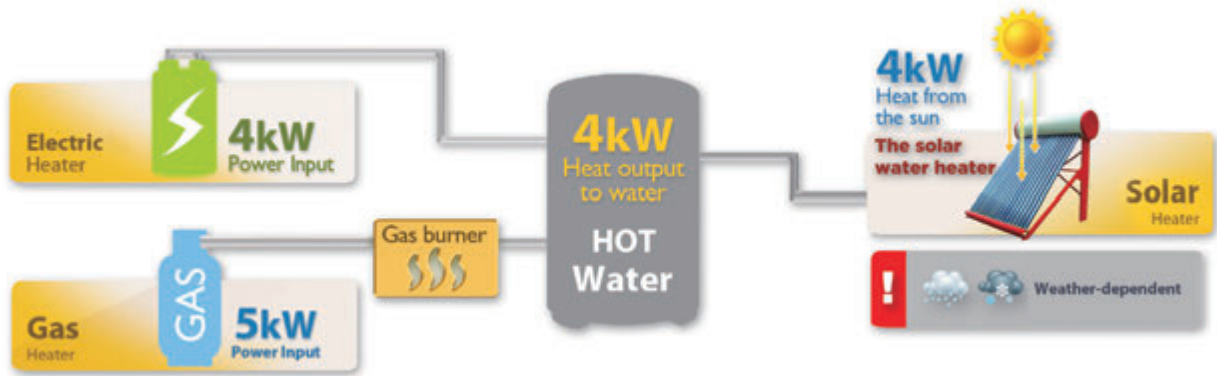


Introduction

Why choose an air source heat pump?



Typically around 3kWh of energy can be captured for every 1kWh of electrical energy expended, giving almost 4kWh of heat energy for only 1kWh of electrical input and giving efficiency of almost 400%.



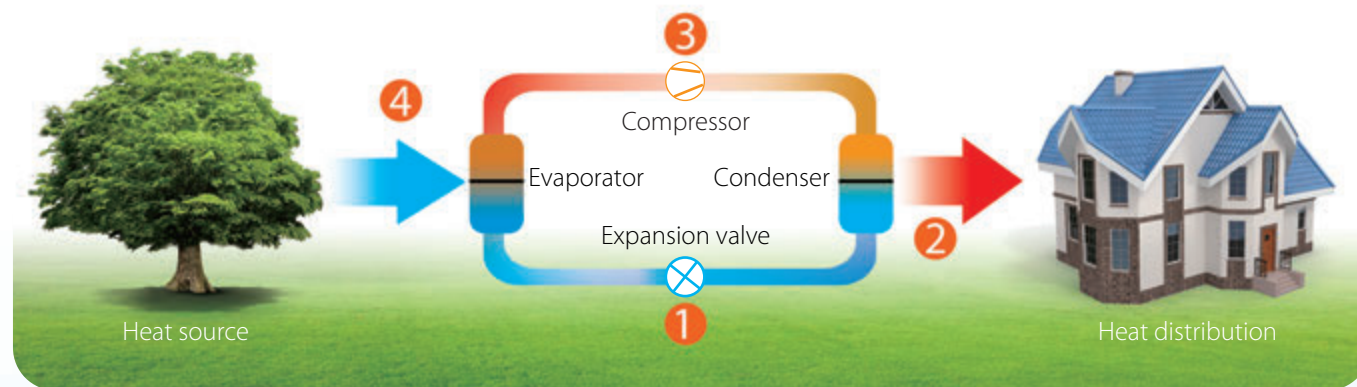
Comparison of energy sources

	Midea air source heat pump	Gas boiler	Electric water Heater	Diesel boiler	Solar water heater
Energy source	Air and electricity	LPG	Electric	Diesel	Sun and electricity
Calorific value	860kcal/kWh	24000kcal/m³	860kcal/kWh	10200kcal/kg	860kcal/kWh
Average efficiency	4.0	0.8	0.95	0.7	2.7
Consumption*	11.63kWh	2.09m³	48.96kWh	5.6kg	17.22kWh
Running cost(USD)	0.9	5.9	4.3	6.5	1.5

LPG: Liquefied Petroleum Gas
1. Products tested under controlled conditions at Midea laboratories.
2. * 40,000kcal are required to heat 1 ton of water from 15°C to 55°C.

How air source heat pump works

M-Thermal heat pump units are capable of extracting heat from the surrounding air and transferring this heat indoors for space heating and domestic hot water. For space cooling, M-Thermal can reverse the process and remove heat from the indoor air.



1 Stage One

As the refrigerant passes through the expansion valve and expands, its temperature and pressure both drop. Refrigerant R410a does not freeze even though the temperature is very low.

2 Stage Two

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.

3 Stage Three

When the refrigerant vapor passes through the compressor its pressure increases and its temperature rises above that of the water in M-Thermal's hydronic system.

4 Stage Four

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 and domestic hot water tank. The refrigerant cools and condenses and is then ready to return to the expansion valve to start the cycle again.

Total heat 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.

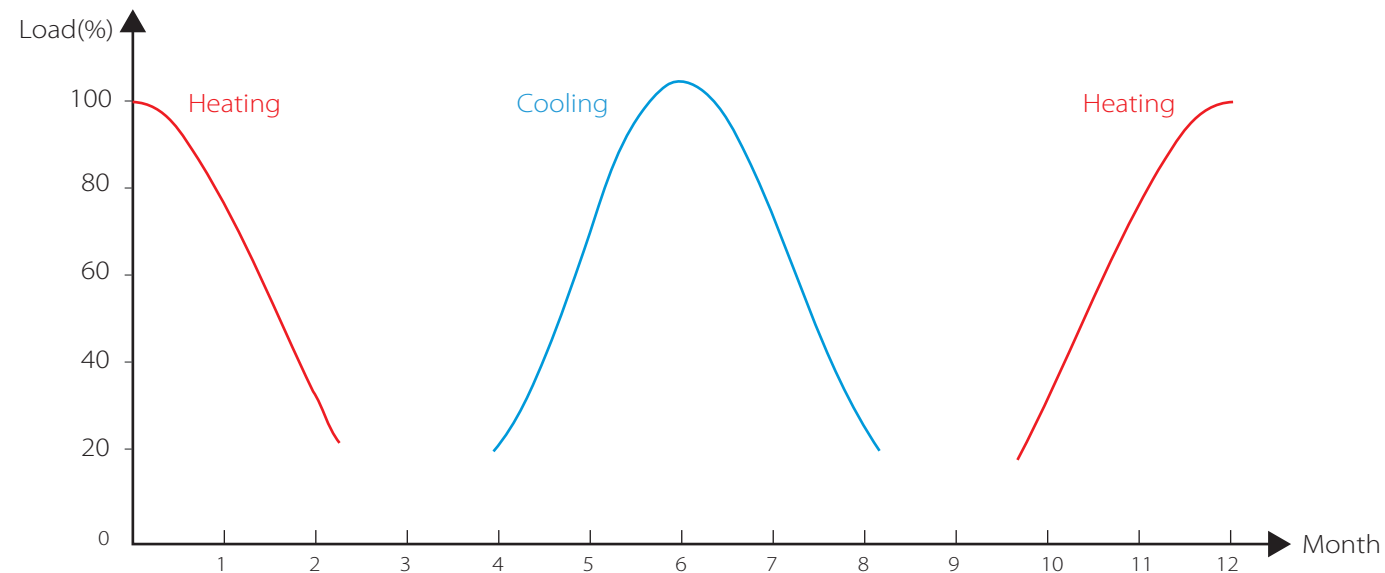


- ❖ The outside air is a renewable source of energy
- ❖ DC inverter technology enables high energy efficiency
- ❖ Sufficient heating capacity at low ambient temperatures (even at -20°C)
- ❖ Provide space heating, cooling and domestic hot water, total heat solution
- ❖ Compatible with other heat sources such as solar panels and boilers



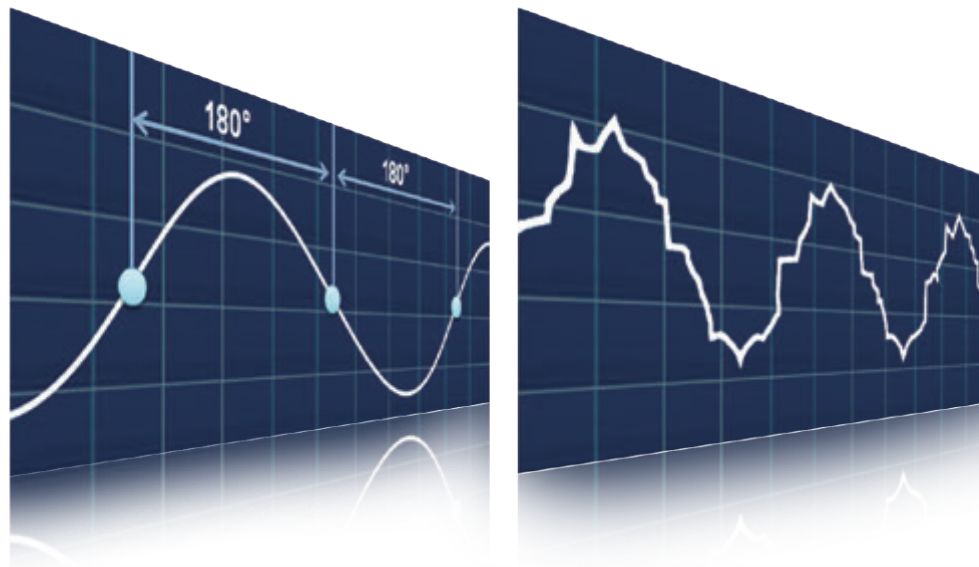
DC Inverter Technology

The motors traditionally used in heat pumps run at full power even during part-load operation, wasting energy. Midea's M-Thermal products use DC inverter technology, which allows precise control of motor speed, ensuring that only the power necessary to perfectly match the real load is used.



High energy efficiency

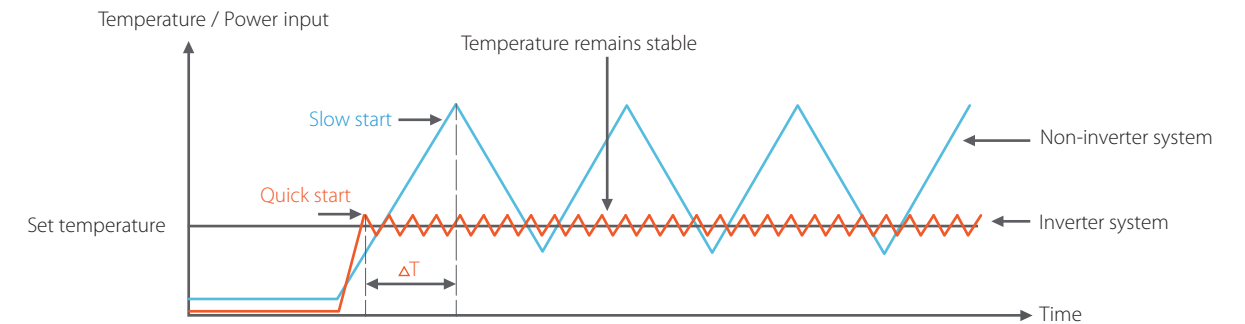
Twin rotary DC inverter compressor uses 30% less power than traditional scroll compressors whilst also giving a wider operating frequency range, enabling precise control and reducing running noise levels.



Smooth sine wave improves efficiency by around 30% compared to conventional saw tooth wave

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 than is possible with non-inverter systems.



Quick start-up

Inverter system output power according to the energy demand by adjusting motor rotary frequency, so it possible to achieve comfort conditions in less time than system without inverter, start-up time reduced.

Less frequent start/stop

The ability to vary compressor speed (as opposed to simple on/off control) means that the compressors experience fewer start/stop cycles which expands compressor lifespan and reduces noise.

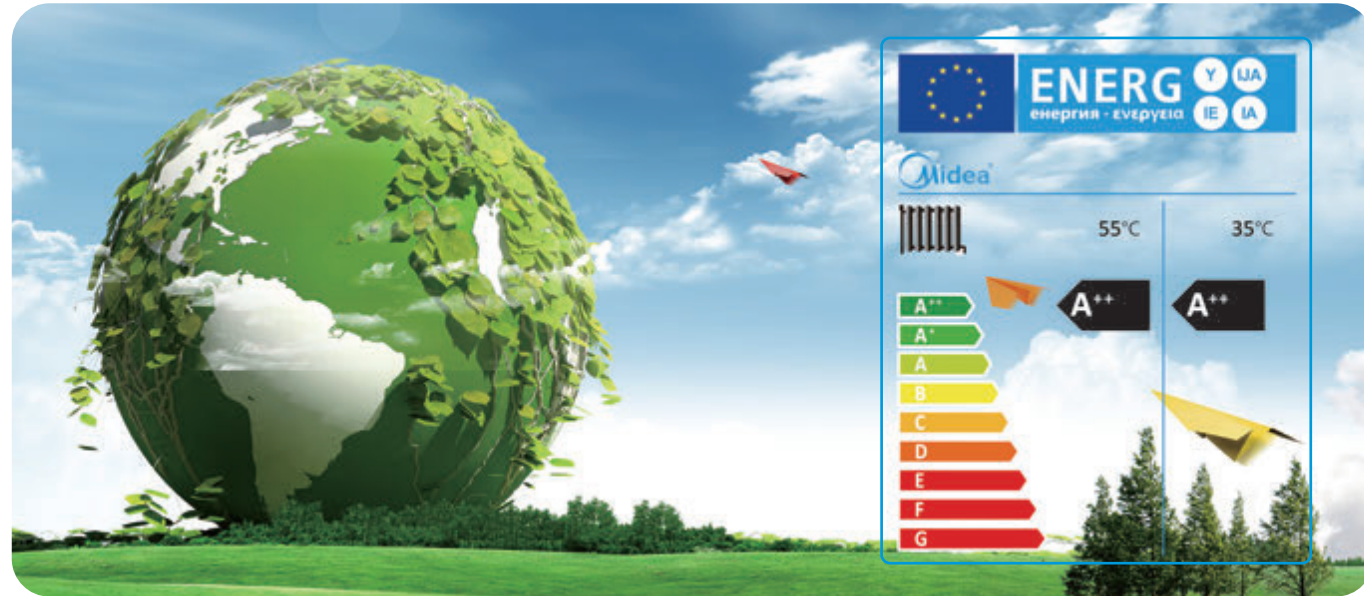
Quiet operation

Most of the time, the capacity required for heating/cooling is lower than the peak load condition, meaning that heat pumps work under part-load conditions most of the time. With DC inverter compressors adjusting rotation speed according to the actual load requirement, noise levels are lower than with traditional compressor technology.





Overview

The M-Thermal range offers the flexibility to either have the hydronic components installed indoors or outdoors. With M-Thermal Mono, the hydronic components are integrated into the outdoor unit, offering ease of installation, whilst with M-Thermal Split the hydronic components are contained in a separate hydronic box, offering more installation flexibility. Both the Mono and Split products are rated A++ on the energy efficiency and make a significant contribution to limiting the impact on the environment.






Product lineup

M-Thermal Mono

Capacity(kW)	5	7	9	10	12	14	16
Appearance							
220~240V-1Ph	●	●	●	●	●	●	●
380~415V-3Ph					●	●	●

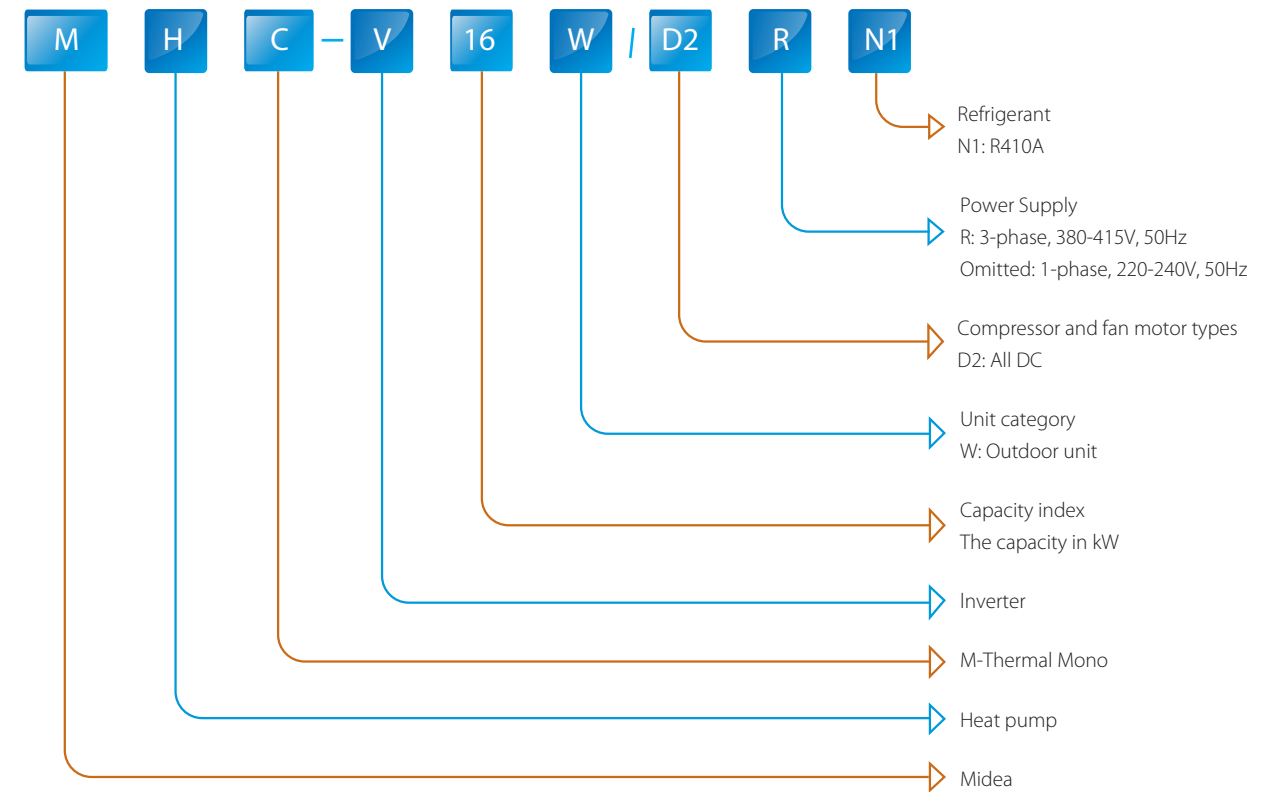
M-Thermal Split

Capacity(kW)	4	6	8	10	12	14	16
Appearance							
220~240V-1Ph	● ●	● ●	● ●	● ●	● ●	● ●	● ●
380~415V-3Ph				● ●	● ●	● ●	● ●

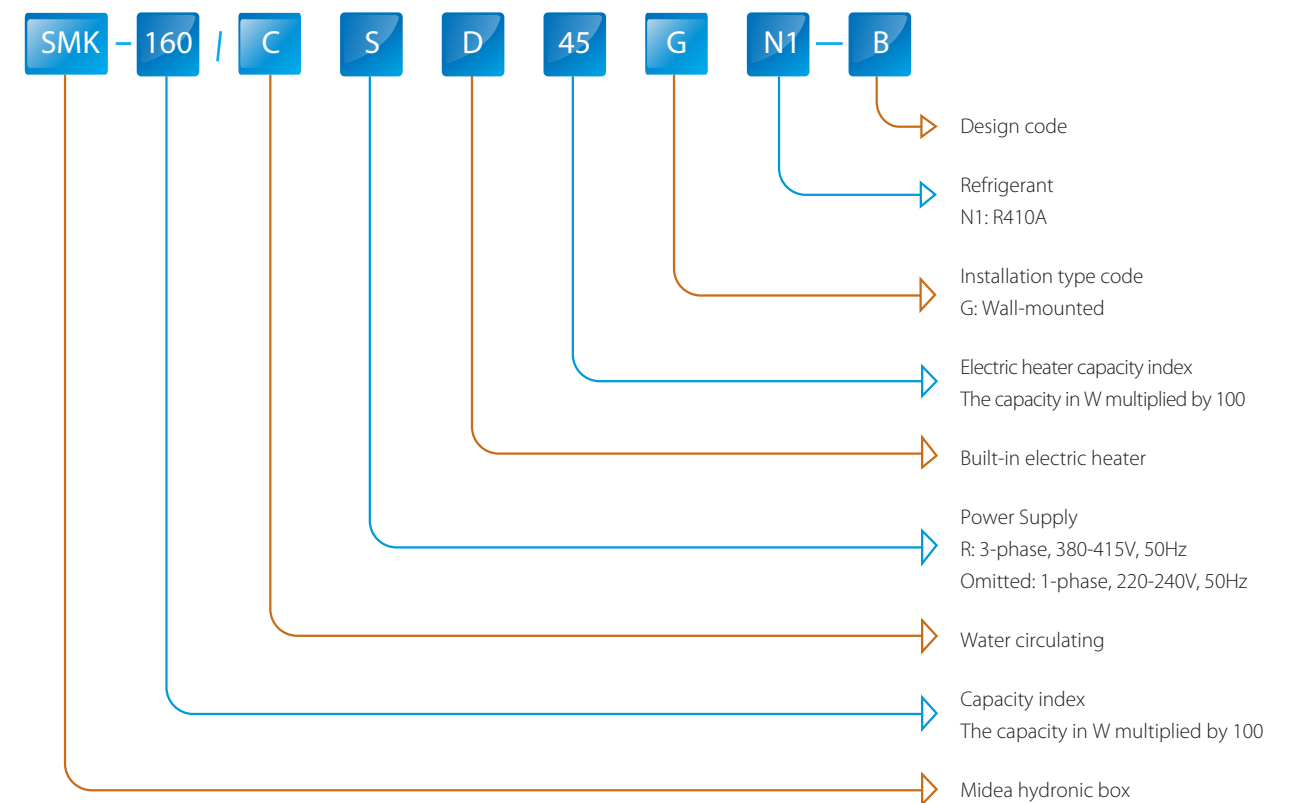
● Outdoor unit ● Hydronic box (4-8kW) ● Hydronic box (1Ph,10-16kW) ● Hydronic box (3Ph,12-16kW)

Nomenclature

Outdoor units



Hydronic box



M-Thermal Mono



Mono outdoor unit

Mono outdoor unit absorbs heat from the outside air and transfers it to the water in the hydronic modular, through water to supply heat to indoor side.

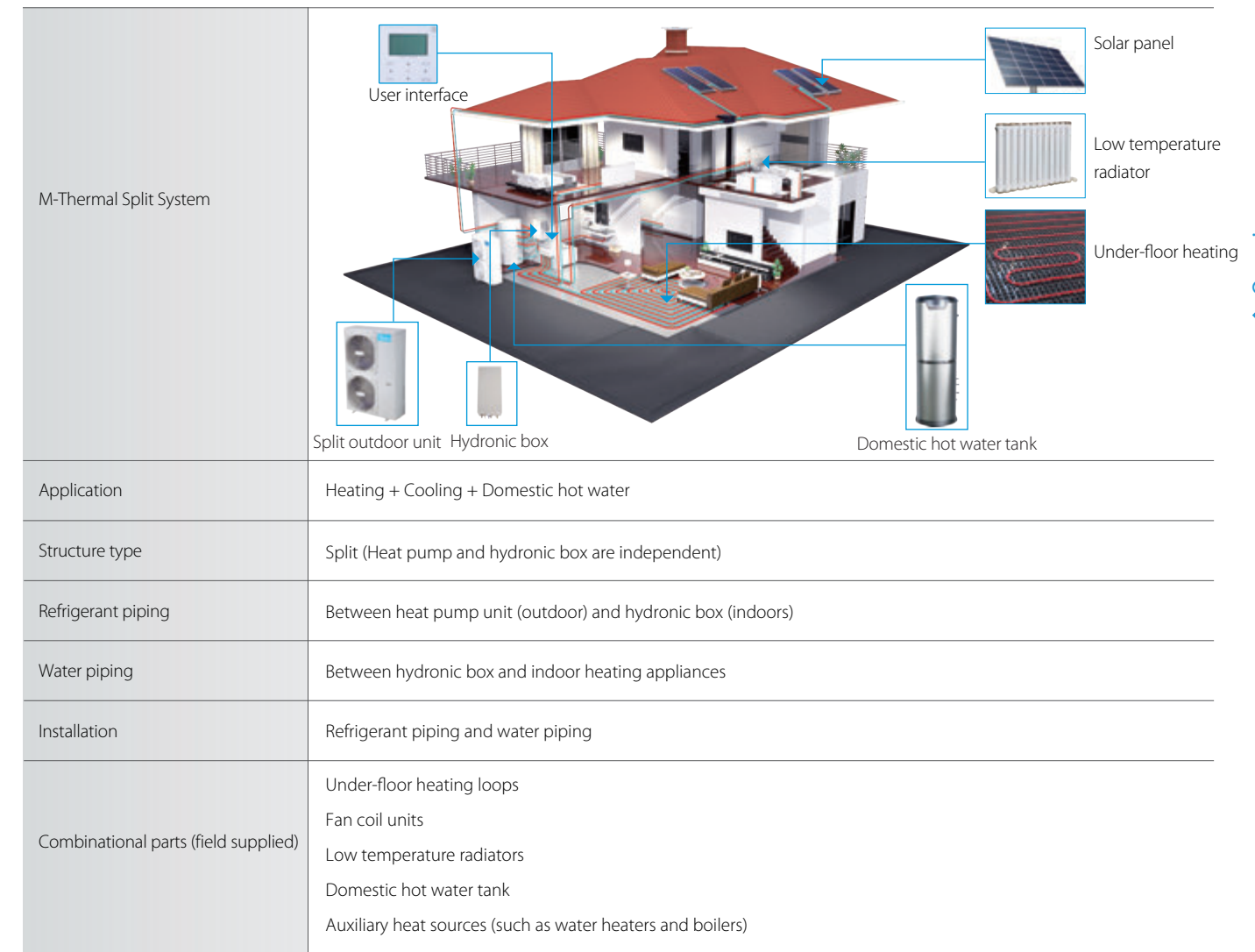
Domestic hot water tank

Hot water from the Mono unit is circulated around the domestic hot water tank's heating water coil, heating the domestic hot water inside the tank. Immersion heaters are often installed in domestic hot water tanks as a backup.

User interface

User interface is connecting to the Mono unit through signal wire; it mainly uses for ON/OFF the unit, mode setting, temperature adjusting and timer setting.

M-Thermal Split



Split type outdoor unit

The outdoor unit absorbs heat from the outside air and transfers it inside through the refrigerant piping.

Hydronic box

The hydronic box heats the water by refrigerant from outdoor unit. The heated water circulates through heating apparatus such as floor heating, radiators, fan coil units as well as inner coil of domestic hot water tank.

Domestic hot water tank

Hot water from the Mono unit is circulated around the domestic hot water tank's heating water coil, heating the domestic hot water inside the tank. Immersion heaters are often installed in domestic hot water tanks as a backup.

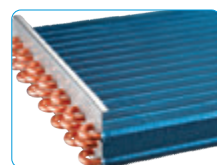
User interface

User interface is connecting to the Mono unit through signal wire; it mainly uses for ON/OFF the unit, mode setting, temperature adjusting and timer setting.

Features

M-Thermal Mono

High efficiency and wide operating range



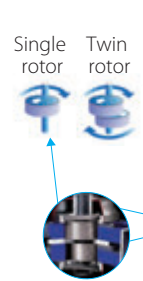
Finned tube heat exchanger
Air side heat exchanger's inner-threaded copper tubing smoothes refrigerant flow to optimize heat exchange efficiency. Hydrophillic coating improves condensate drainage, reducing frost accumulation and improving corrosion resistance.



Brushless DC fan motor
Stepless fan motor control enables super-quiet fan operation and minimizes power consumption.

Twin rotary compressor

Twin rotary DC inverter compressor uses 30% less power than traditional scroll compressors whilst also giving a wider operating frequency range, enabling precise control and reducing running noise levels.



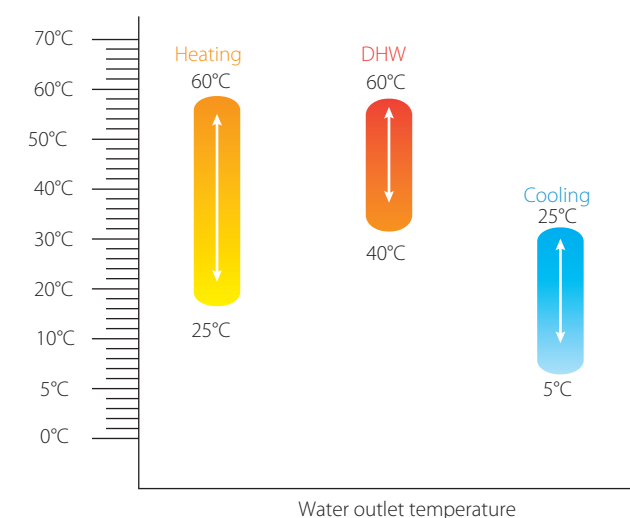
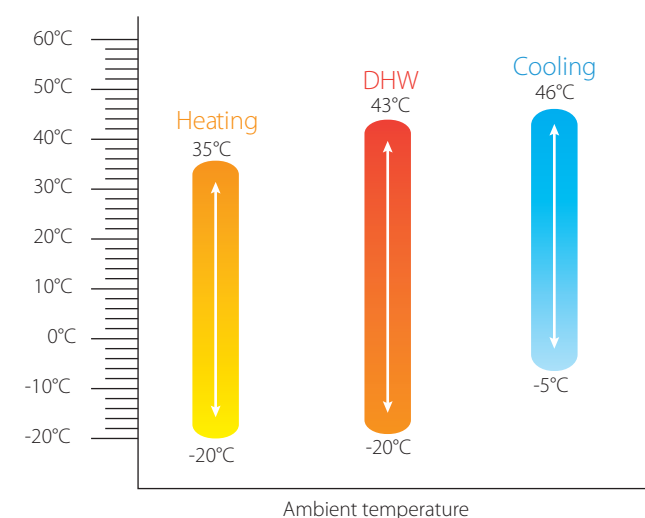
Twin rotary compressor

- High efficiency DC motor:**
- Innovative motor core design
 - High density neodymium magnet
 - Concentrated stator
 - Wide operating frequency range
- 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



Hydronic module
Integrated hydronic module with DC water pump and backup electric heater.

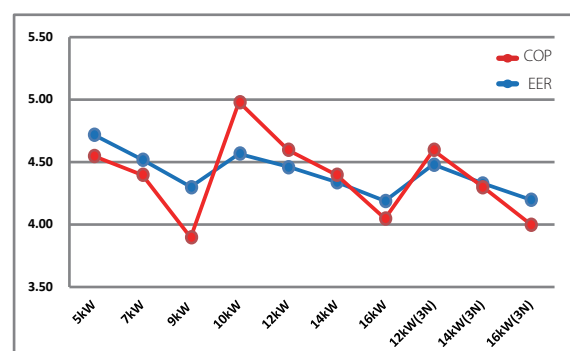
- ❖ Built-in backup electric heater for additional heating during extremely cold weather. The capacity of the backup electric heater is customizable and the output capacity is adjustable.
- ❖ Heating, cooling and domestic hot water: a total heat solution.
- ❖ Wide ambient temperature and water outlet temperature operating ranges.



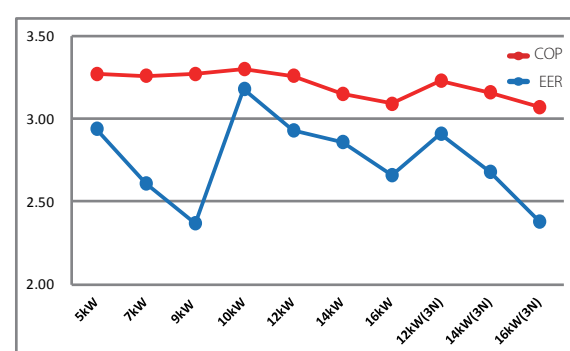
- ❖ Compatible with additional heat sources (AHSs) including solar water heaters and boilers. AHSs can work together with heat pump or alternative for space heating and domestic hot water dependent on the system control.

Easy installation and easy maintenance

- ❖ All hydronic components are located within the outdoor unit.
- ❖ Refrigerant system entirely contained within outdoor unit - no additional refrigerant piping required.
- ❖ Compact structure, easy for transportation and installation.
- ❖ Two-door design for easy access to internal components for easy maintenance.



COP test conditions: ambient temp. 7°C; leaving water temp. 35°C
EER test conditions: ambient temp. 35°C; leaving water temp. 18°C



COP test conditions: ambient temp. 7°C; leaving water temp. 55°C
EER test conditions: ambient temp. 35°C; leaving water temp. 7°C

- ❖ Offers heating capacity of 80% at -7°C thanks to the large heat exchanger and large compressor.



Door 1: Access to hydronic components and electrical parts

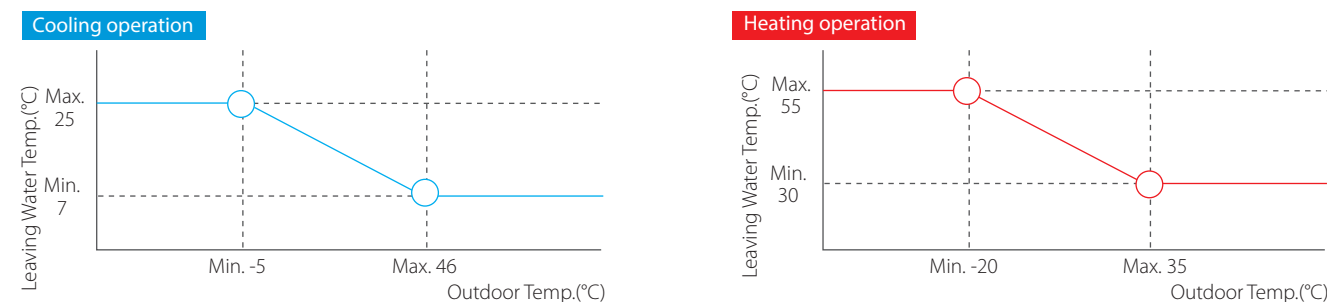


Door 2: Access to refrigerant components and electrical parts.

Flexible operation and more comfort

- Weather dependent operation with climate correlation to ensure absolute comfort.

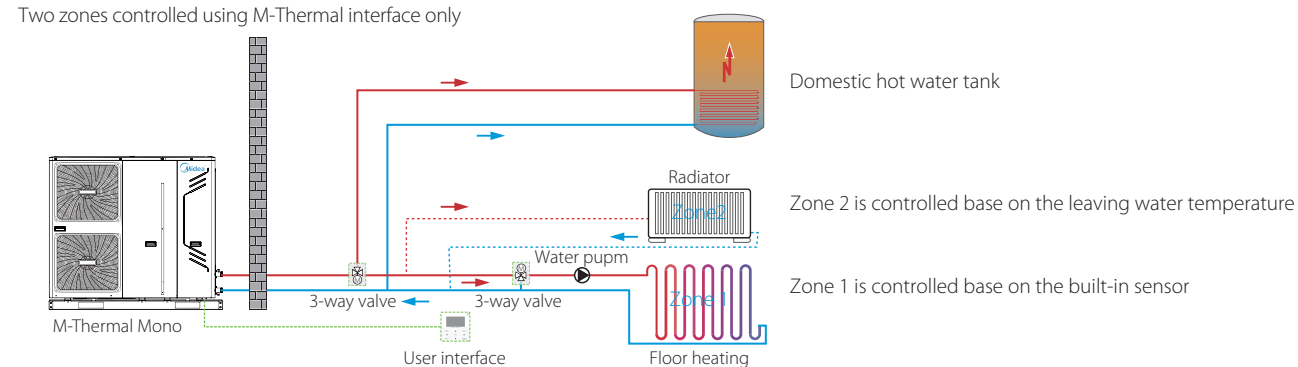
Totally there are 32 climate correlation curves for choice. Once the curve is selected, the unit set the outlet water temperature automatically according to the outdoor ambient temperature.



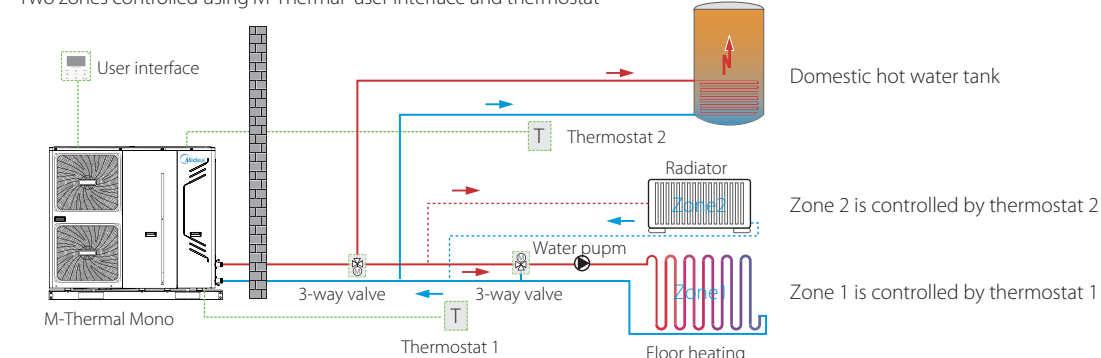
- Two zones control more flexibility

Temperature of each zone is separately controlled. Two zones control reduces water pump cycle time and save energy.

Two zones controlled using M-Thermal interface only



Two zones controlled using M-Thermal user interface and thermostat



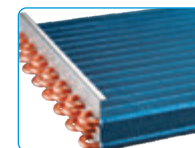
- Priority setting function and multi modes choice



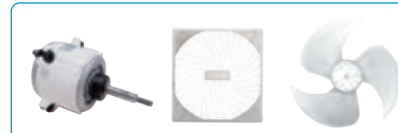
- Special functions such as air purge, preheating for floor and floor drying up

M-Thermal Split

High efficiency and total heat solution



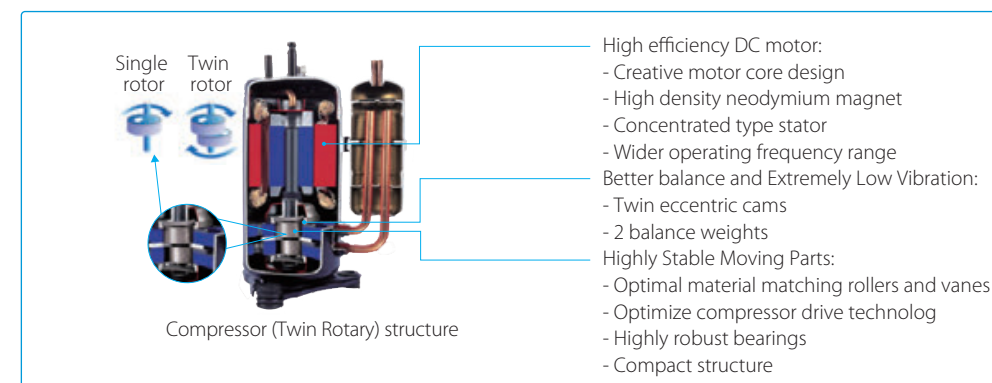
Fin-coil heat exchanger
 Ø9.5 inner-threaded copper pipes optimize heat exchange efficiency. Plate type hydrophilic aluminum foil used for air side heat exchange, which is easy for water drain and prevents forest to a great extent. Blue coating increases the resistance against corrosive agents, enhance durability.



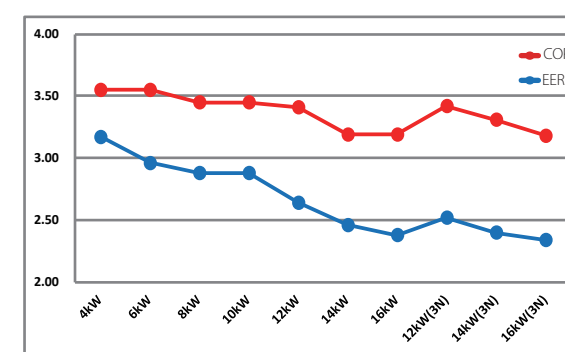
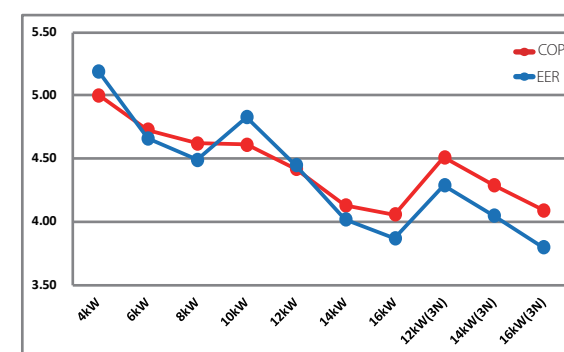
Brushless DC fan motor
 BLDC fan motor with stepless control helps to meet heating and cooling demands with low noise fan, super quiet operation, as well low power consumption.

DC inverter compressor

The newly designed twin rotary DC inverter compressor with permanent magnet brings low working sound, wide working frequency and precession control. The upgraded DC motor power system of inverter model forms a full DC frequency conversion system and dramatically reduces power consumption by more than 30%.

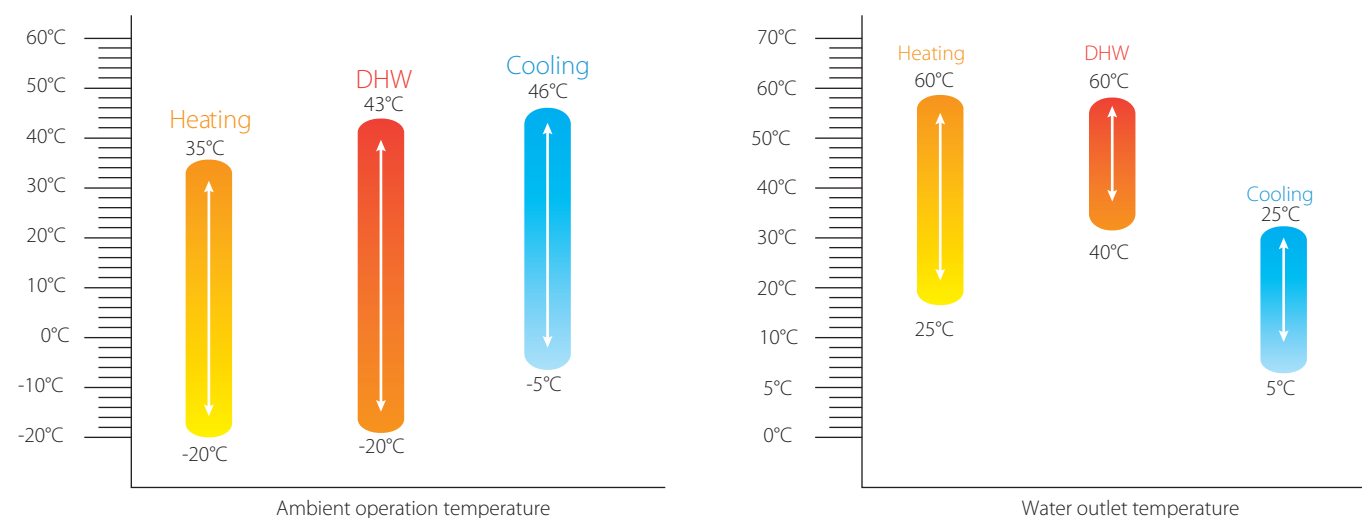


- Twin rotary DC inverter compressor to guarantee optimal operational reliability and efficiency.



- Offers heating capacity of 80% at -7°C thanks to the large heat exchanger and large compressor.

- ❖ Heating, cooling and domestic hot water: a total heat solution.
- ❖ Wide ambient temperature and water outlet temperature operating ranges.
- ❖ Compatible with additional heat sources (AHSs), including solar water heaters and boilers. AHSs can work together with heat pump or alternative for space heating and domestic hot water dependent on the system control.



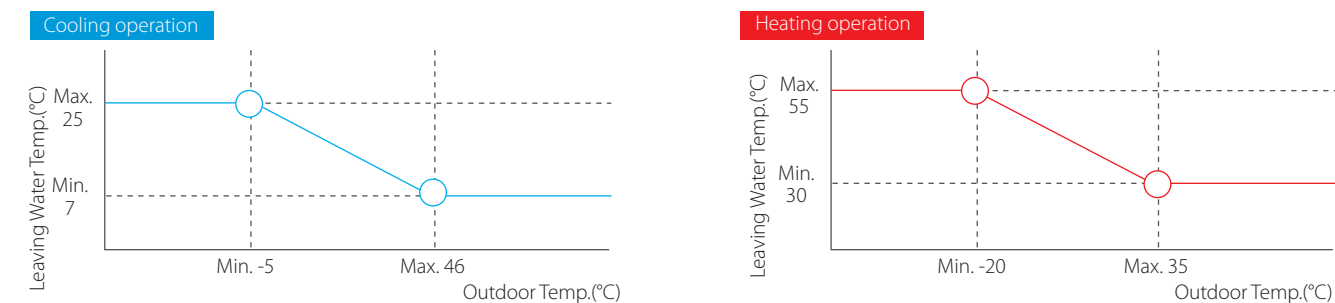
Flexible installation and easy maintenance

- ❖ Compact structure, independent hydronic box, flexible installation.
- ❖ Refrigerant pipes run indoors from the outdoor unit, no need extra insulation of water piping to protect from freezing up.
- ❖ Additional refrigerant charge only required if refrigerant piping length exceeds 10m.



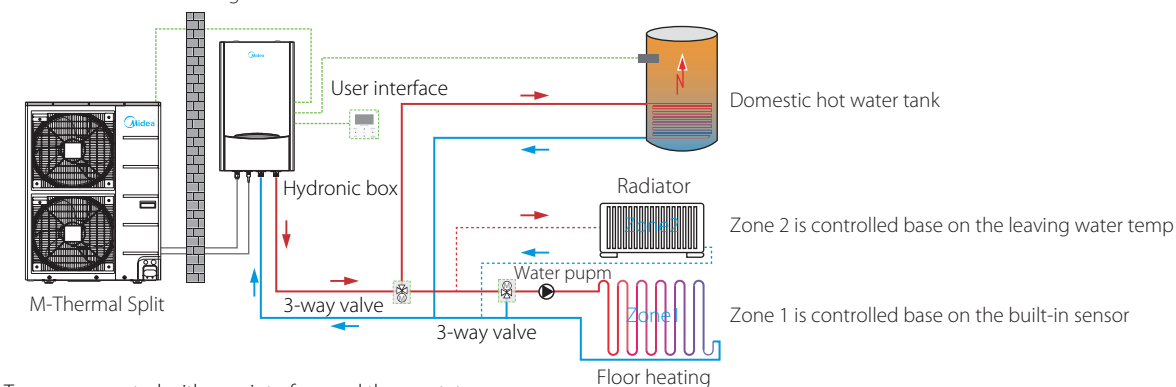
Flexible operation and more comfort

- ❖ Weather dependent operation with climate correlation to ensure absolute comfort. Totally there are 32 climate correlation curves for choice. Once the curve is selected, the unit set the outlet water temperature automatically according to the outdoor ambient temperature.

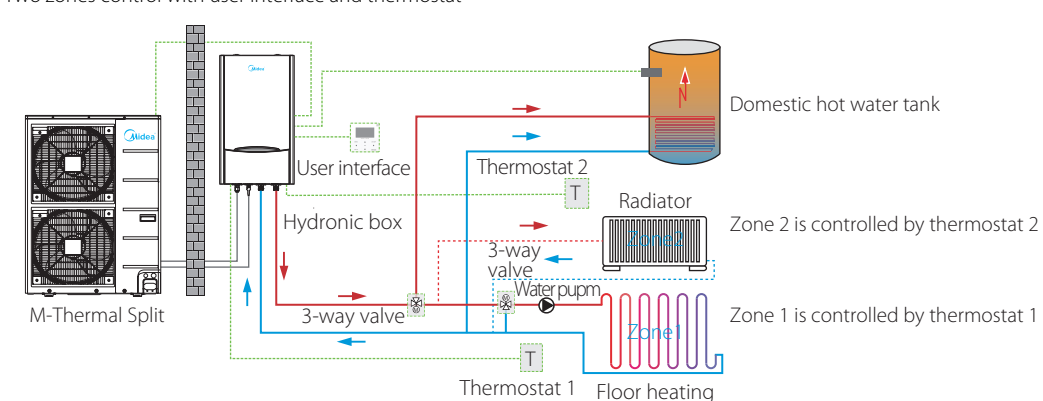


- ❖ Two zones controlled using M-Thermal interface only. Temperature of each zone is separately controlled. Two zones control reduces water pump cycle time and save energy.

Two zones controlled using M-Thermal one user interface



Two zones control with user interface and thermostat



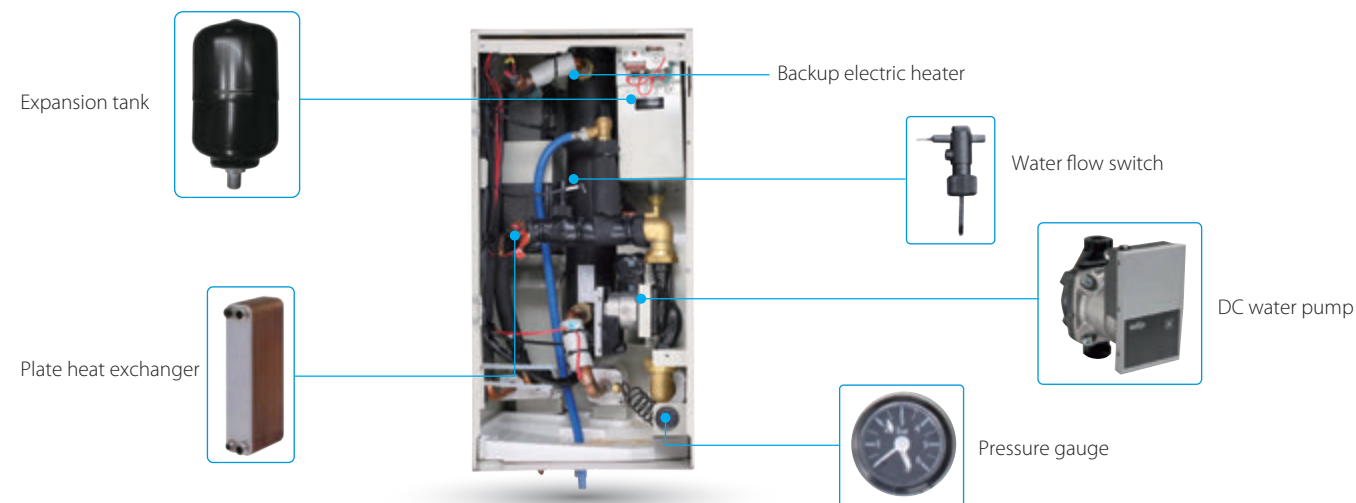
- ❖ Priority setting function and multi modes choice



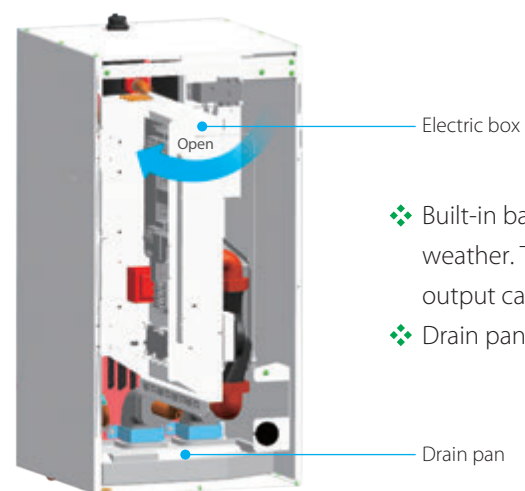
- ❖ Special functions such as air purge, preheating for floor and floor drying up

Hydronic box

- ❖ Integrated water-side heat exchange solution for easy installation.



- ❖ Rotating electric control box enables easy maintenance access to all hydronic components.



- ❖ Built-in backup electric heater for additional heating during extremely cold weather. The capacity of the backup electric heater is customizable and the output capacity is adjustable.
- ❖ Drain pan fitted as standard.

User interface



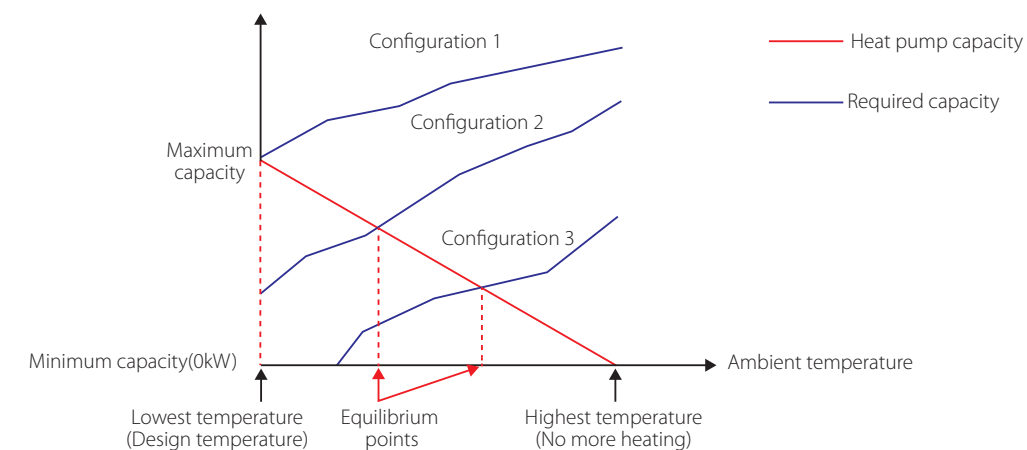
- ❖ Newly designed touch-key wired controller.
- ❖ Communication wire length customizable up to 150m.
- ❖ Built-in temperature sensor.
- ❖ Modbus protocol.

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.

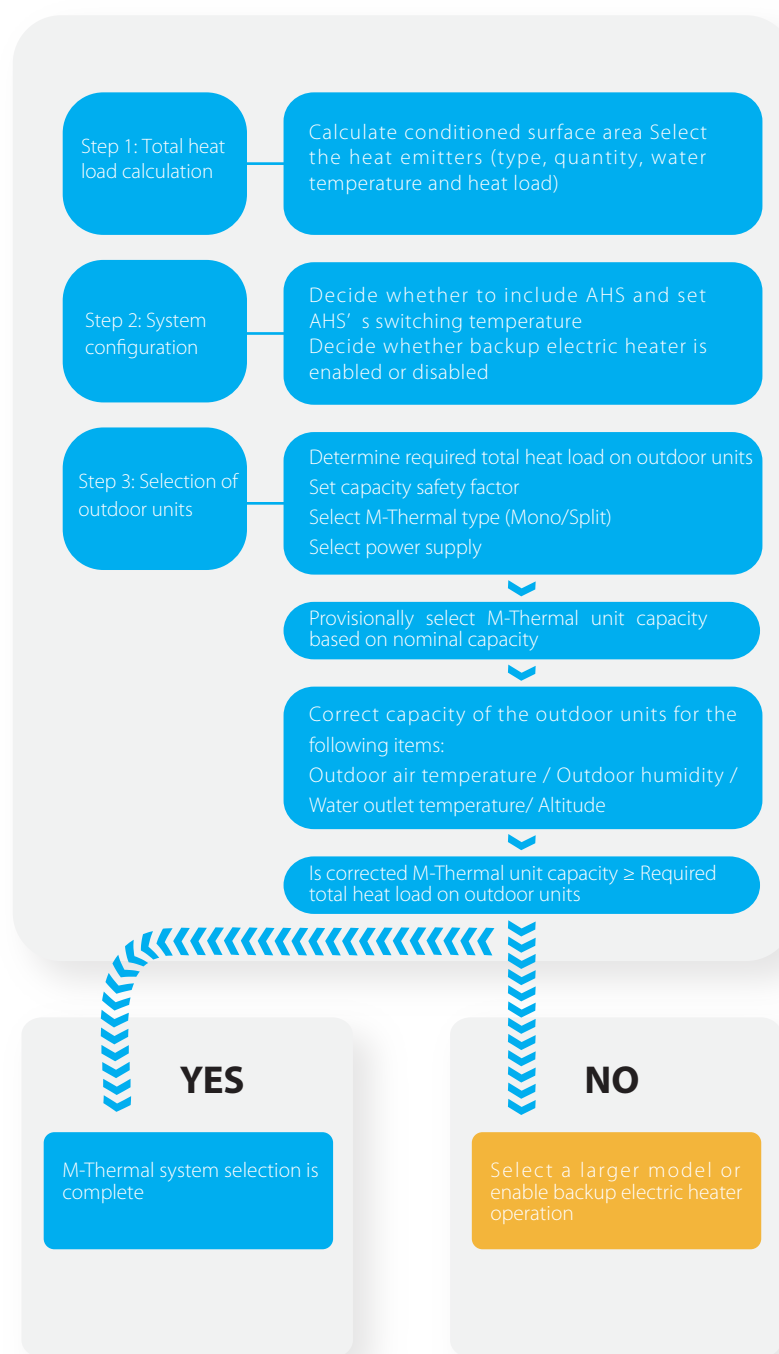
Configuration 2: Heat pump and backup electric heater

- ❖ 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)

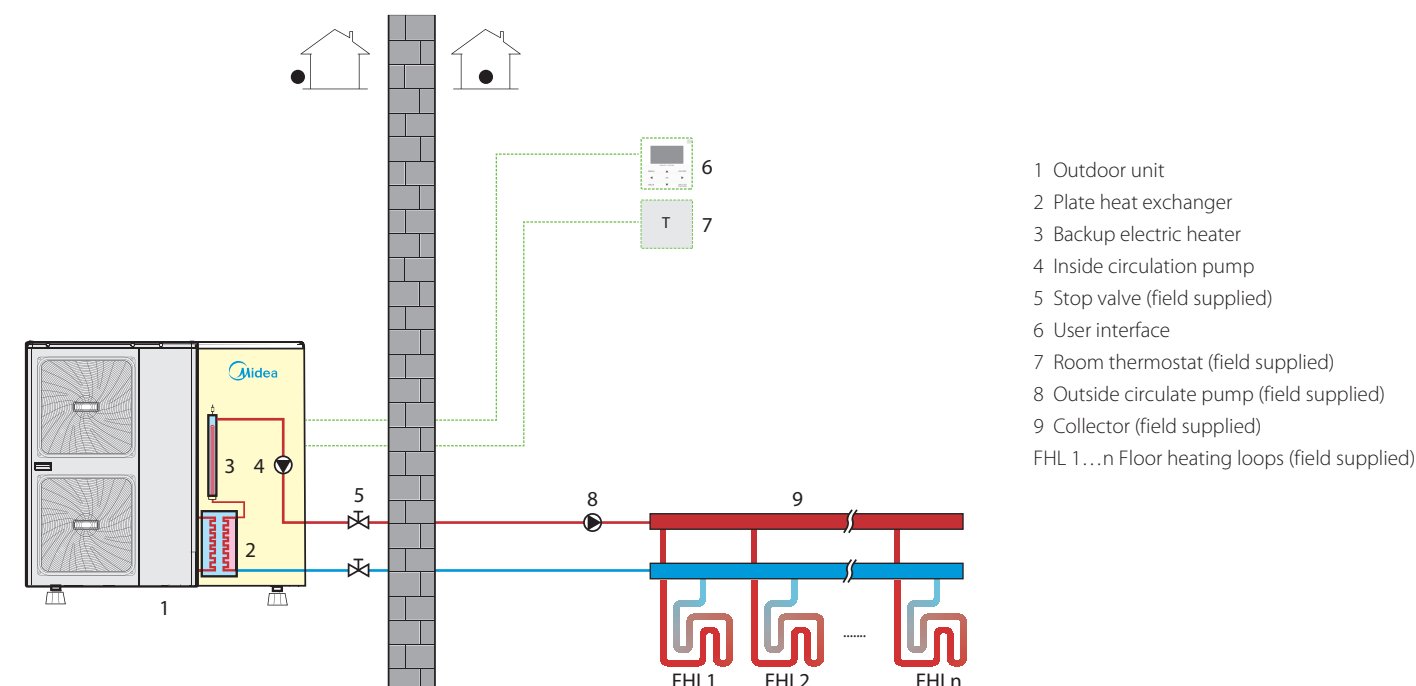
The recommended design LTW ranges for different types of heat emitter are:

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

M-Thermal Mono

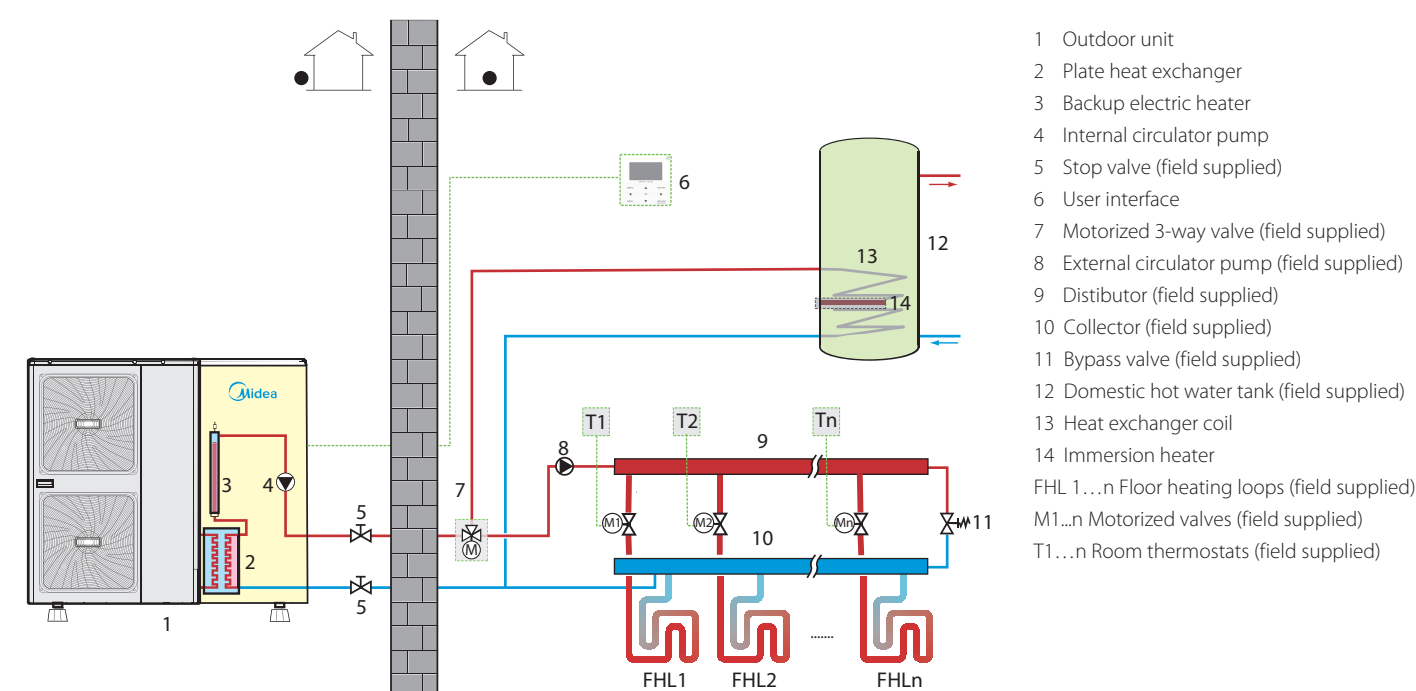
❖ Application 1: Space Heating Only

The room thermostat is used as a switch. When there is a heating request from the room thermostat, the Mono unit operates to achieve the target water temperature set on the user interface. When the room temperature reaches the thermostat's set temperature, the unit stops.



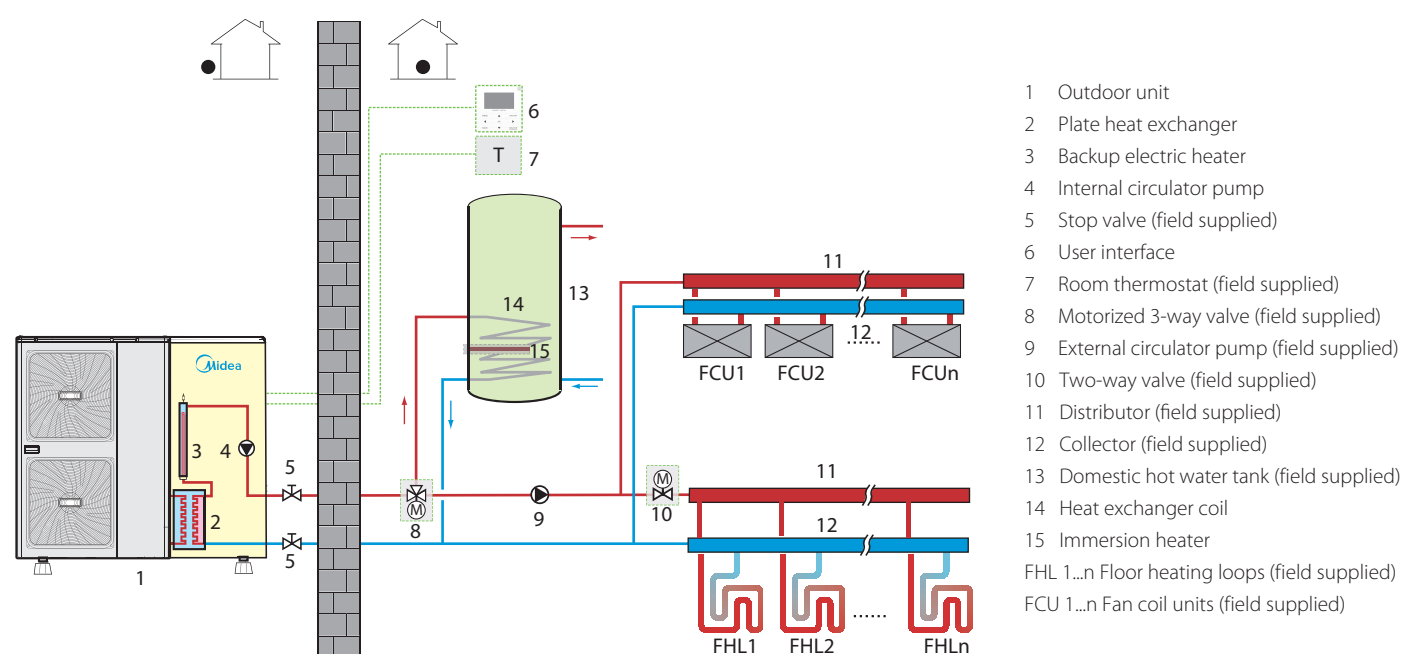
❖ Application 2: Space Heating and Domestic Hot Water

The room thermostats are not connected to the Mono unit but to a motorized valve. Each room's temperature is regulated by the motorized valve on its water circuit. Domestic hot water is supplied from the domestic hot water tank connected to the Mono unit. A bypass valve is required.



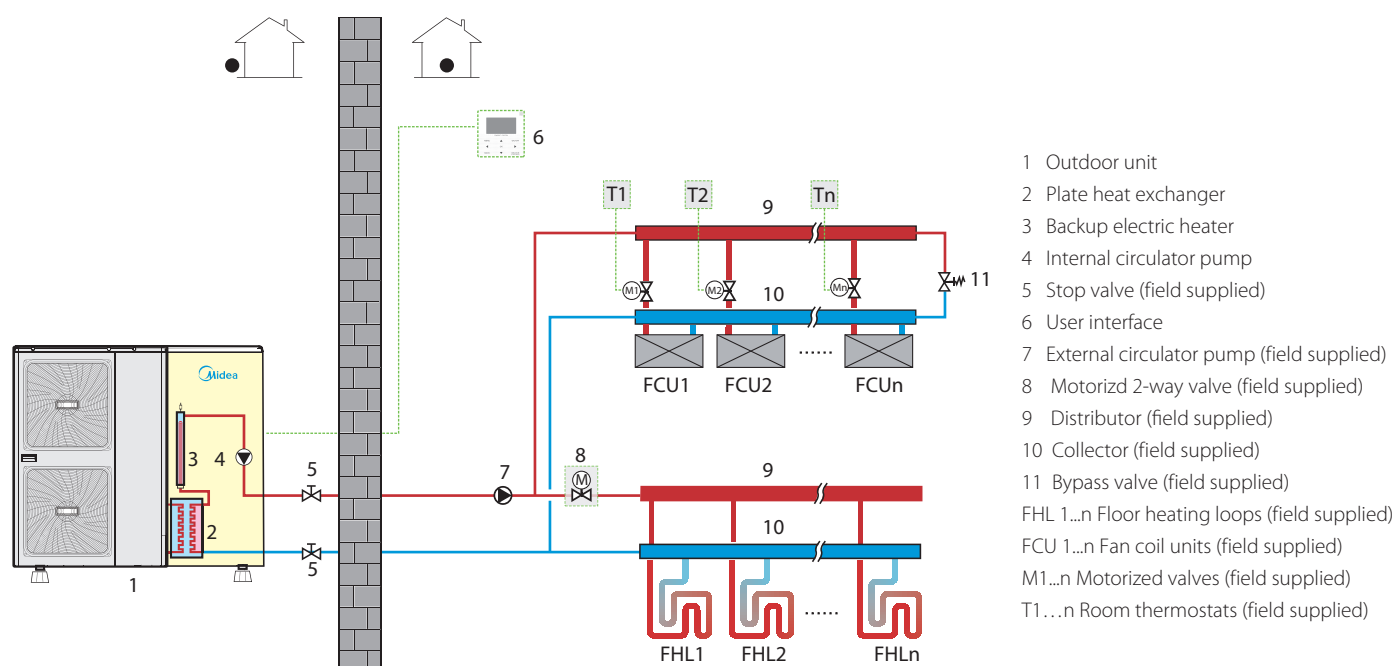
❖ Application 3: Space Heating, Space Cooling and Domestic Hot Water

Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to the Mono unit. The unit switches to heating or cooling mode according to the temperature detected by the room thermostat. In space cooling mode, the 2-way valve is closed to prevent cold water entering the floor heating loops.



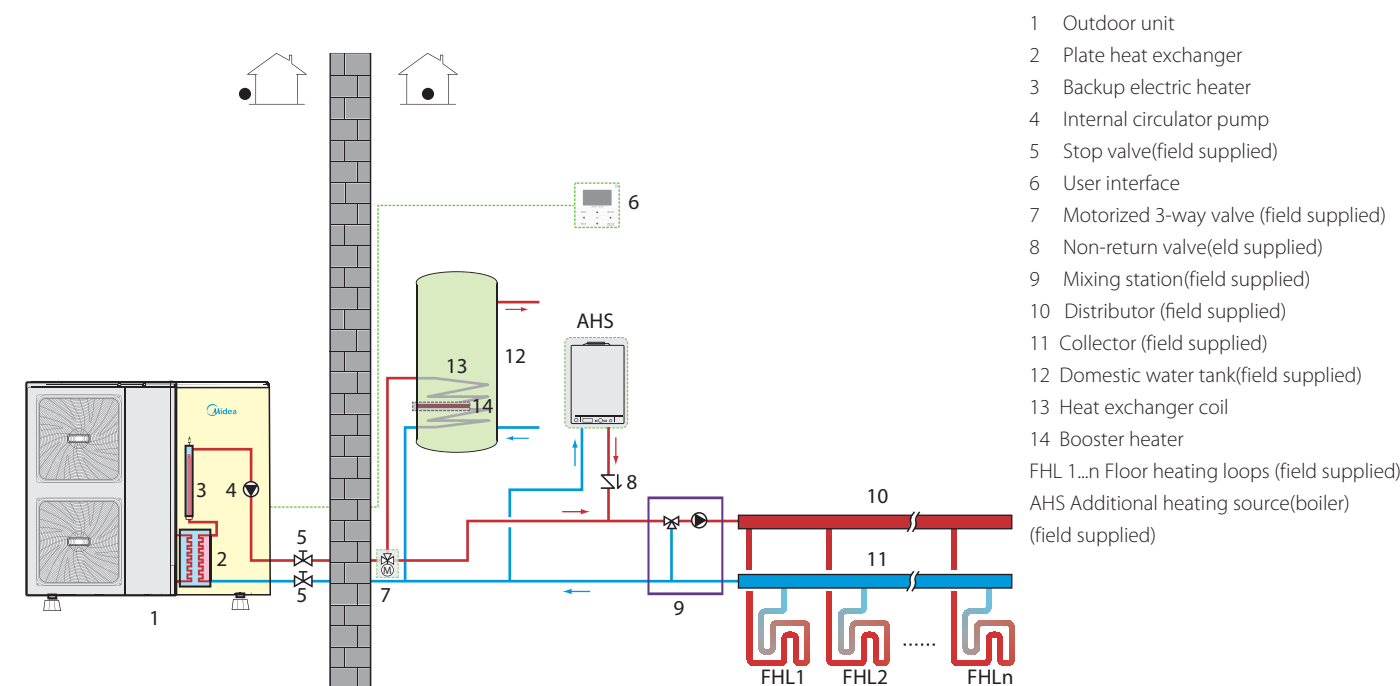
❖ Application 4: Space Heating and Space Cooling

Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. The room thermostats are not connected to the Mono unit but are connected to the fan coil units

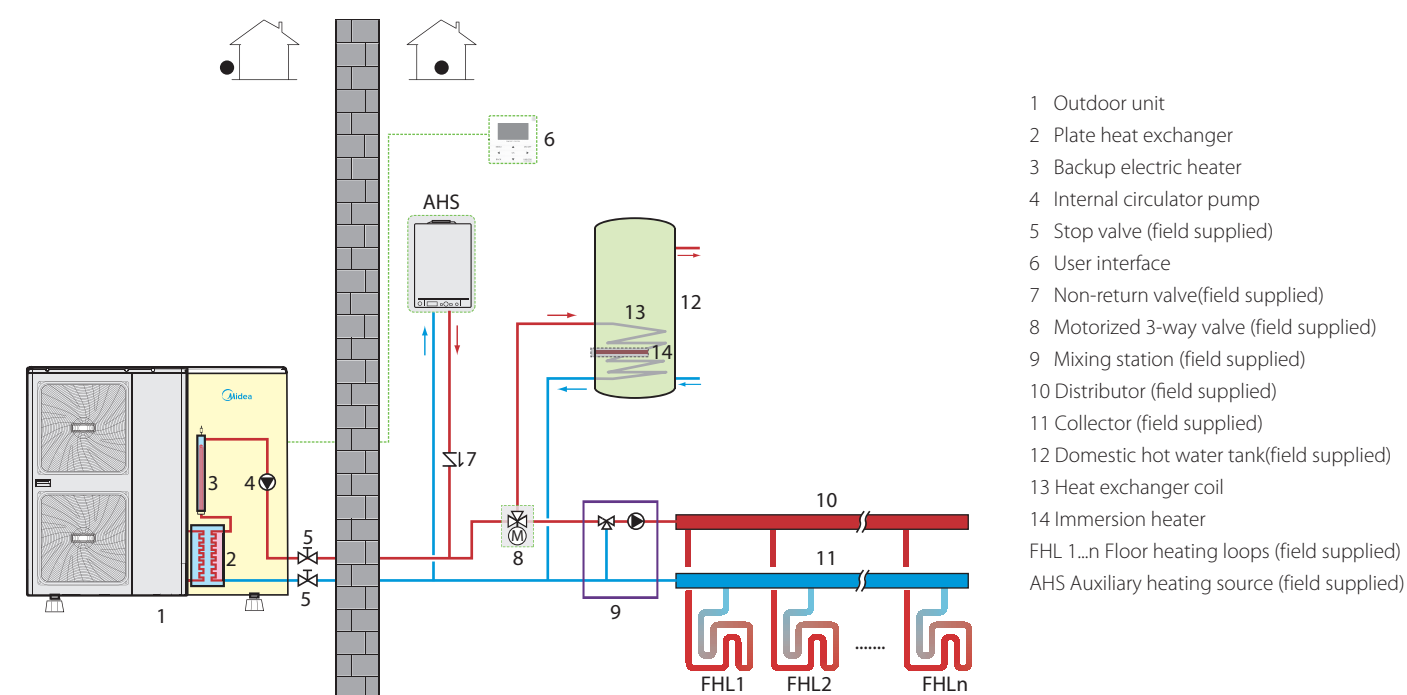


❖ Application 5: Space Heating and Domestic Hot Water (Bivalent)

5-1 Auxiliary heat source provides space heating only

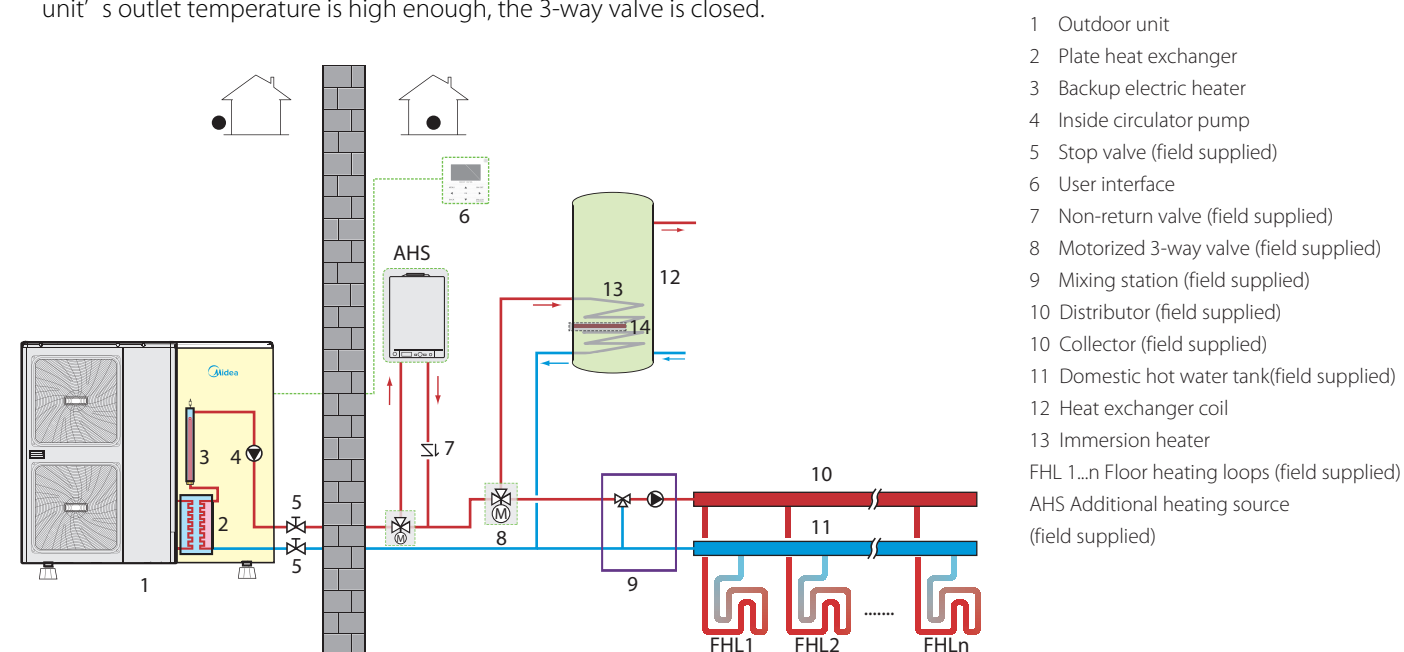


5-2 Auxiliary heat source provides space heating and domestic hot water



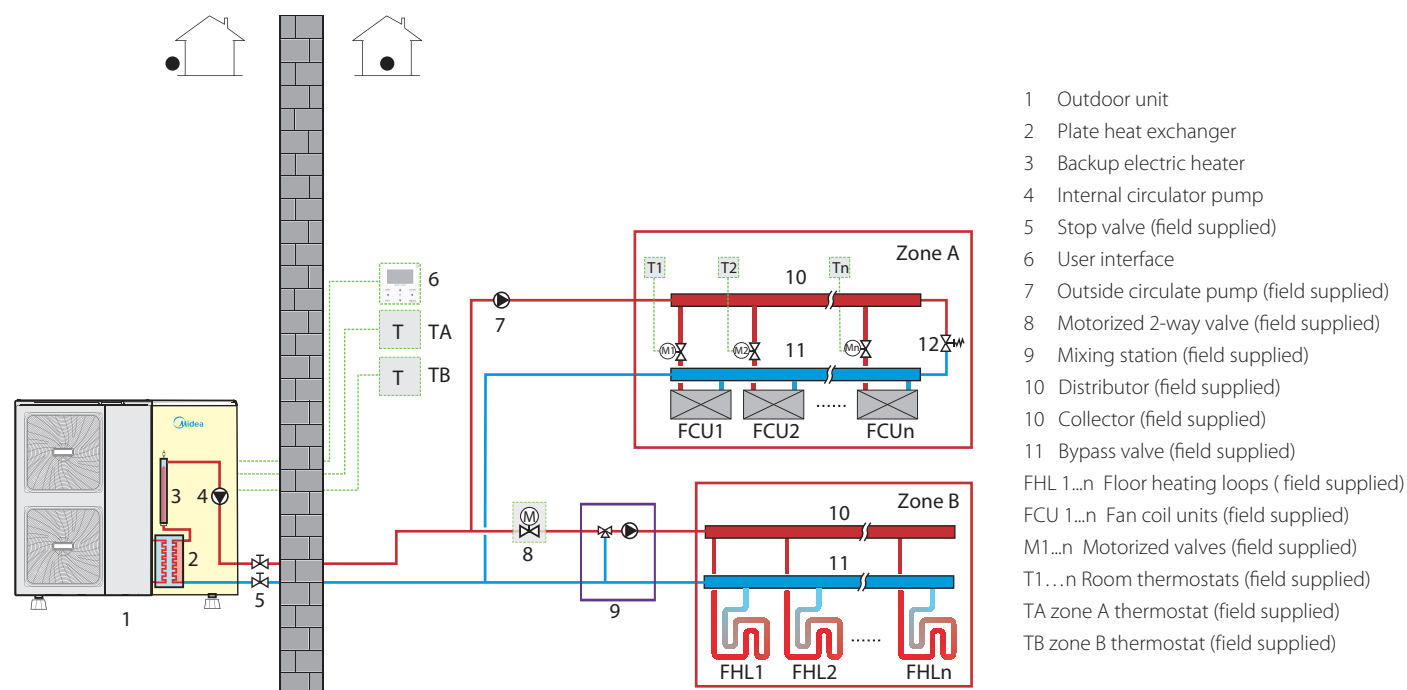
5-3 Auxiliary heat source provides additional heating

If the Mono unit's outlet temperature is too low, the auxiliary heat source provides additional heating to raise the water temperature to the set temperature. An additional 3-way valve is required. When the Mono unit's outlet temperature is too low, the 3-way valve is open and the water flows through the auxiliary heat source. When the Mono unit's outlet temperature is high enough, the 3-way valve is closed.



❖ Application 6: Space Heating Through Floor Heating Loops and Fan Coil Units

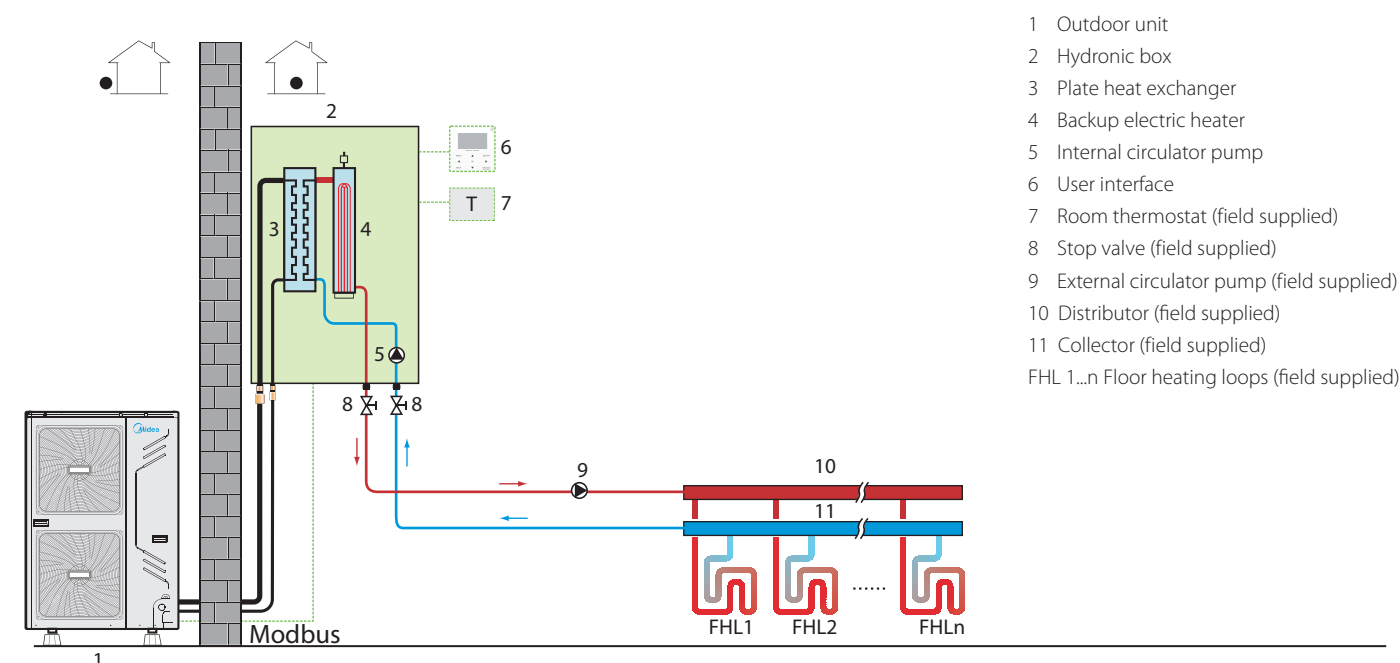
The floor heating loops and fan coil units require different operating water temperatures. To achieve these two set points, a mixing station is required. Room thermostats for each zone are optional.



M-Thermal Split

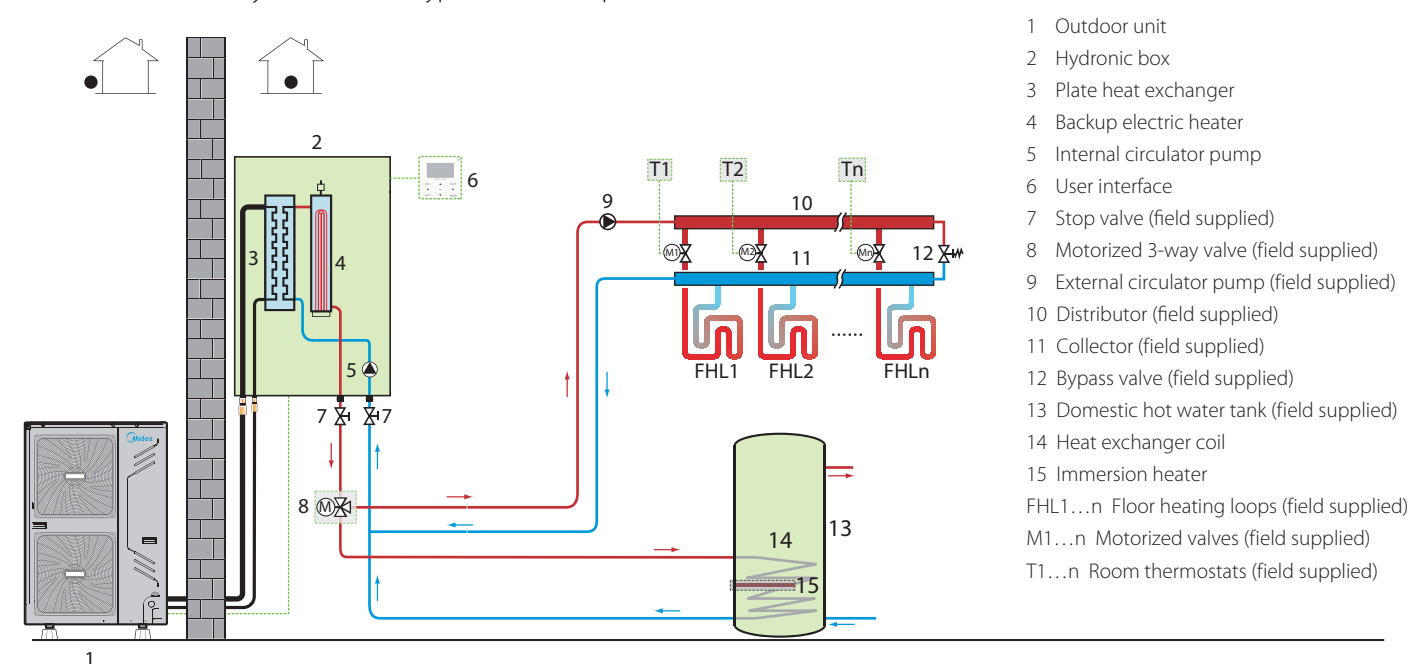
❖ Application 1: Space Heating Only

The room thermostat is used as a switch. When there is a heating request from the room thermostat, the Mono unit operates to achieve the target water temperature set on the user interface. When the room temperature reaches the thermostat's set temperature, the unit stops.



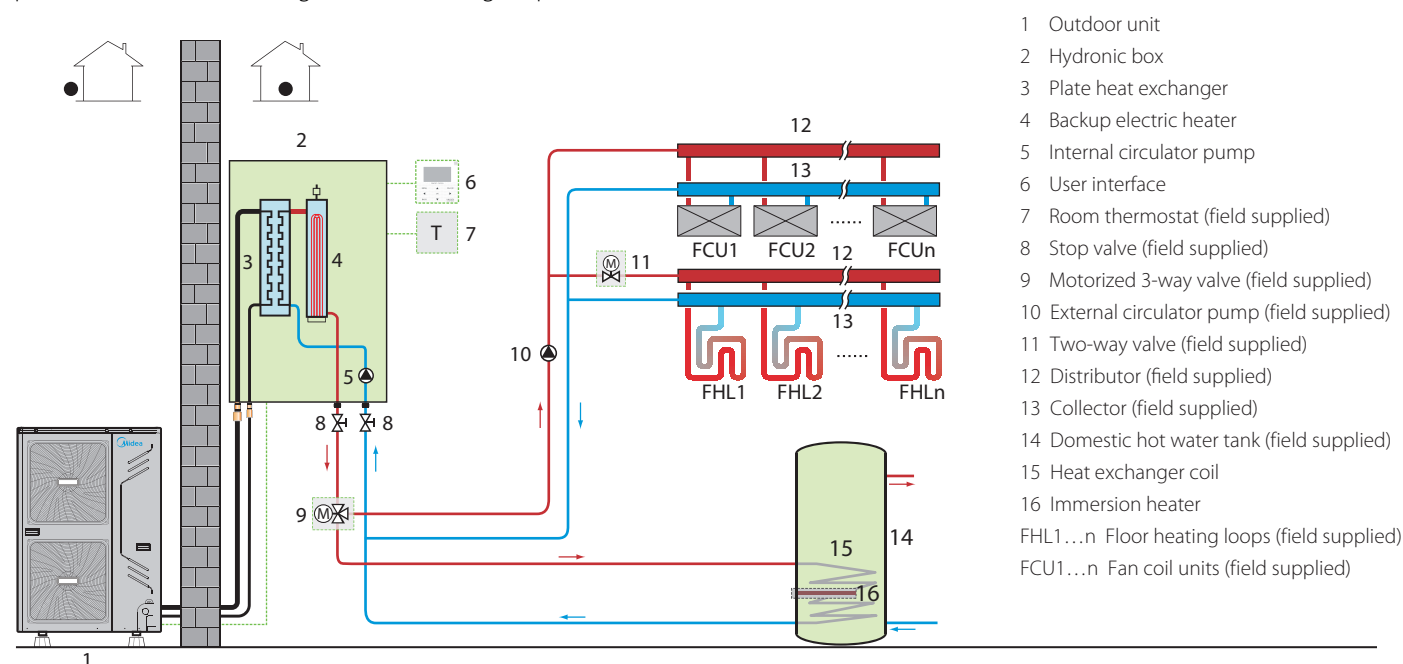
❖ Application 2: Space Heating and Domestic Hot Water

The room thermostats are not connected to the hydronic box but to a motorized valve. Each room's temperature is regulated by the motorized valve on its water circuit. Domestic hot water is supplied from the domestic hot water tank connected to the hydronic box. A bypass valve is required.



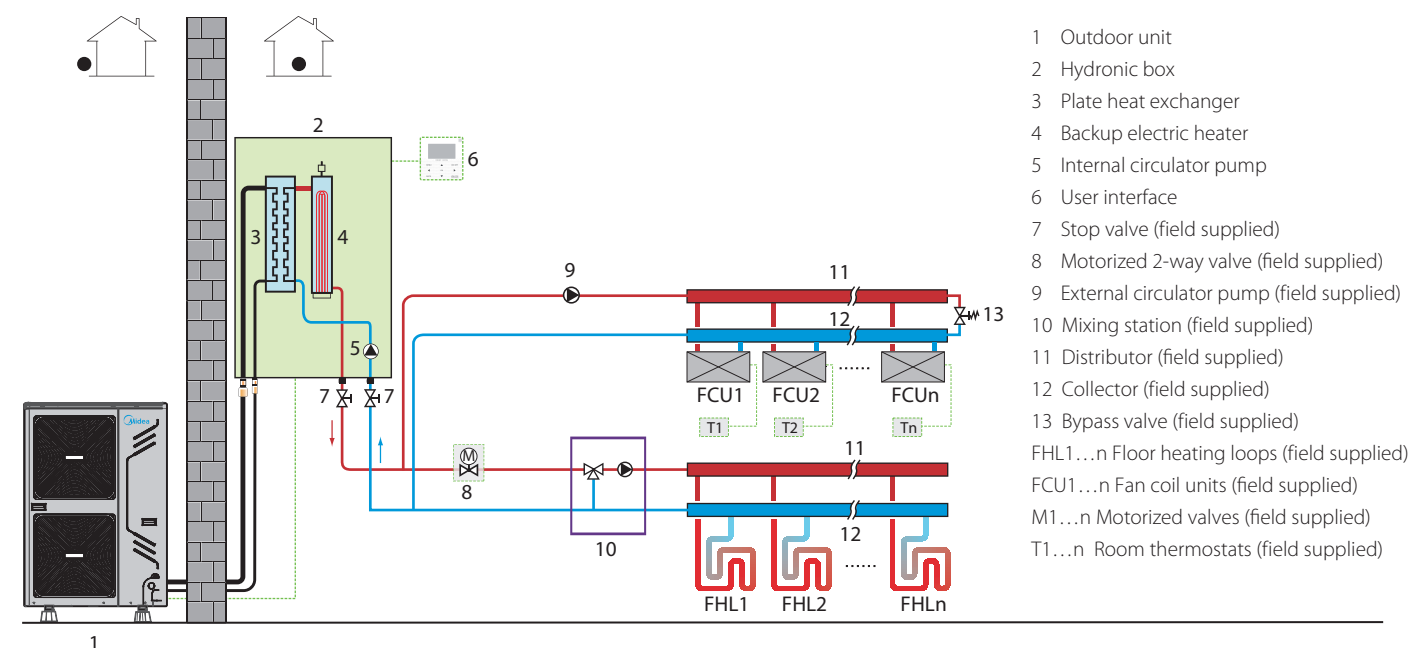
❖ Application 3: Space Heating, Space Cooling and Domestic Hot Water

Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to the hydronic box. The unit switches to heating or cooling mode according to the temperature detected by the room thermostat. In space cooling mode, the 2-way valve is closed to prevent cold water entering the floor heating loops.



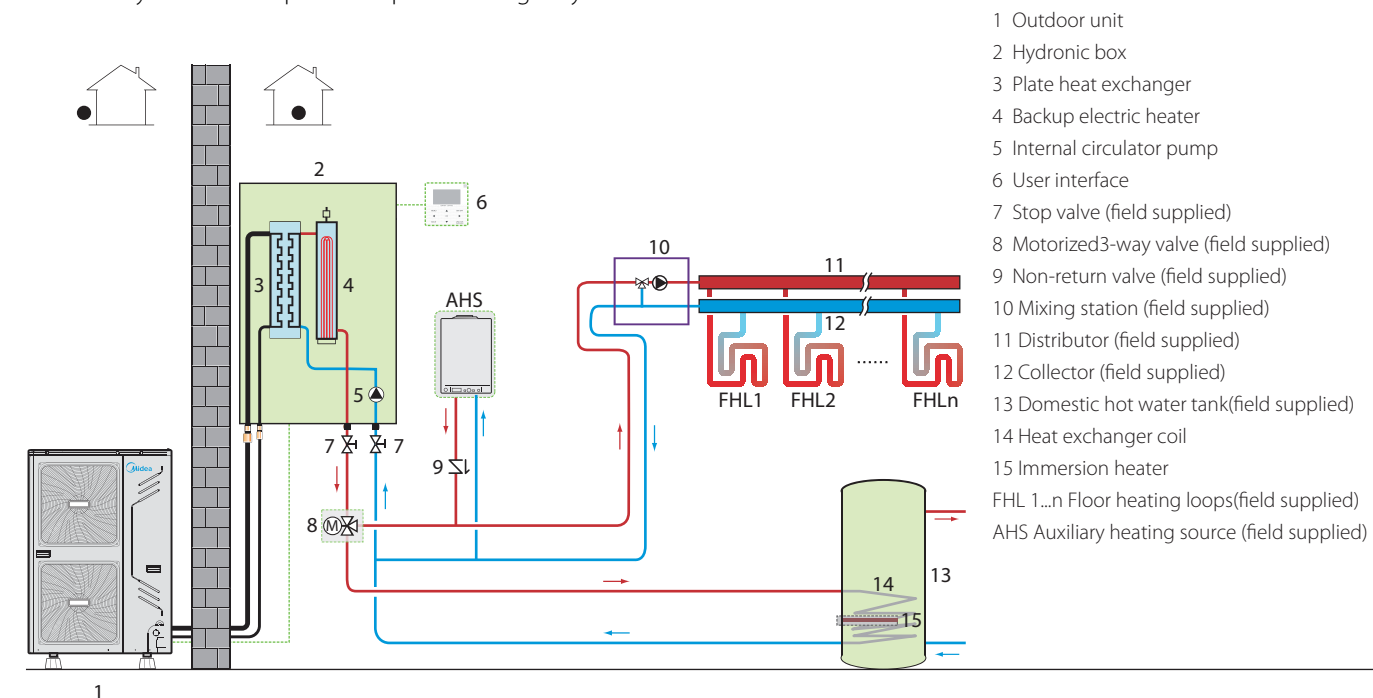
❖ Application 4: Space Heating and Space Cooling

Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. The room thermostats are not connected to the hydronic box but are connected to the fan coil units.

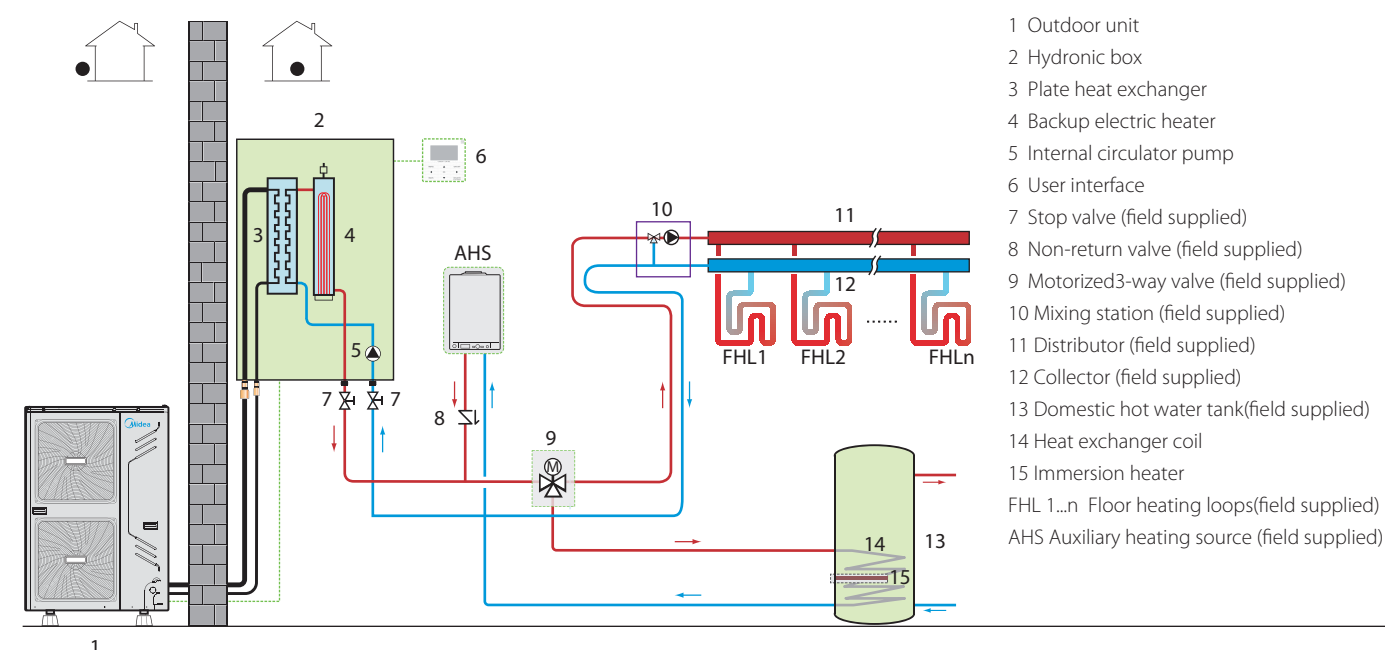


❖ Application 5: Space Heating and Domestic Hot Water (Bivalent)

5-1 Auxiliary heat source provides space heating only

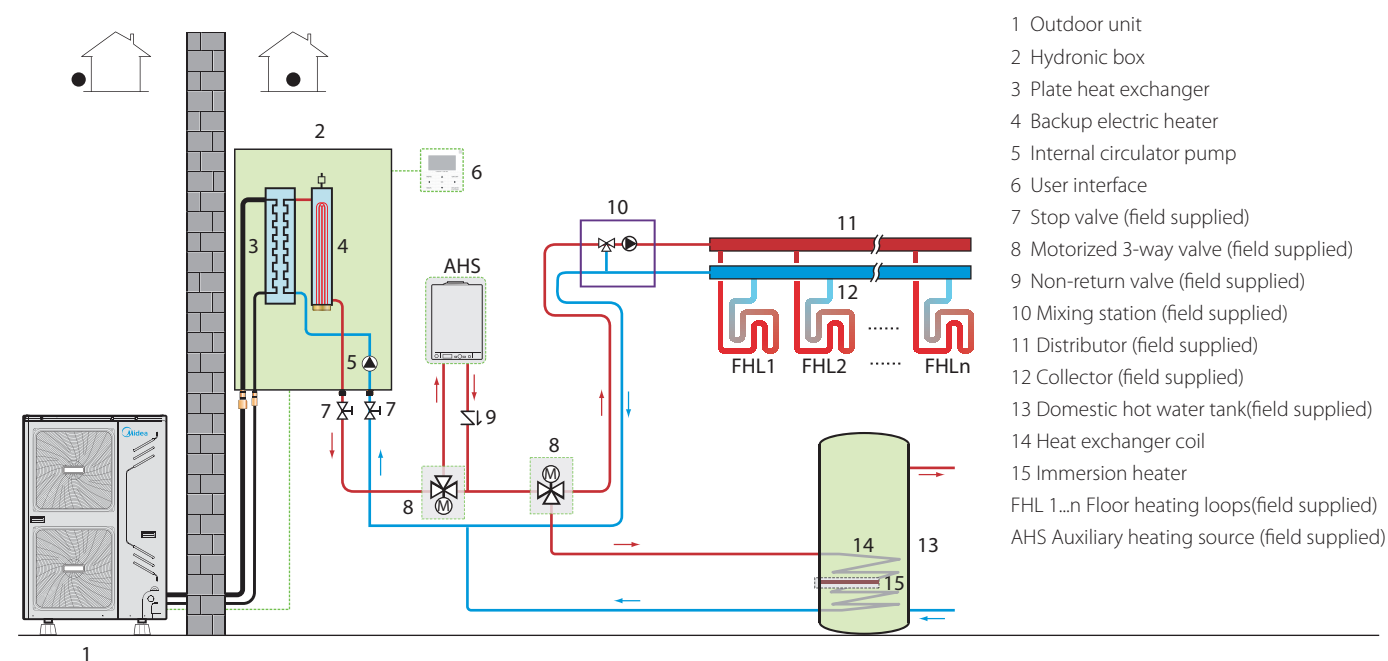


5-2 Auxiliary heat source provides space heating and domestic hot water



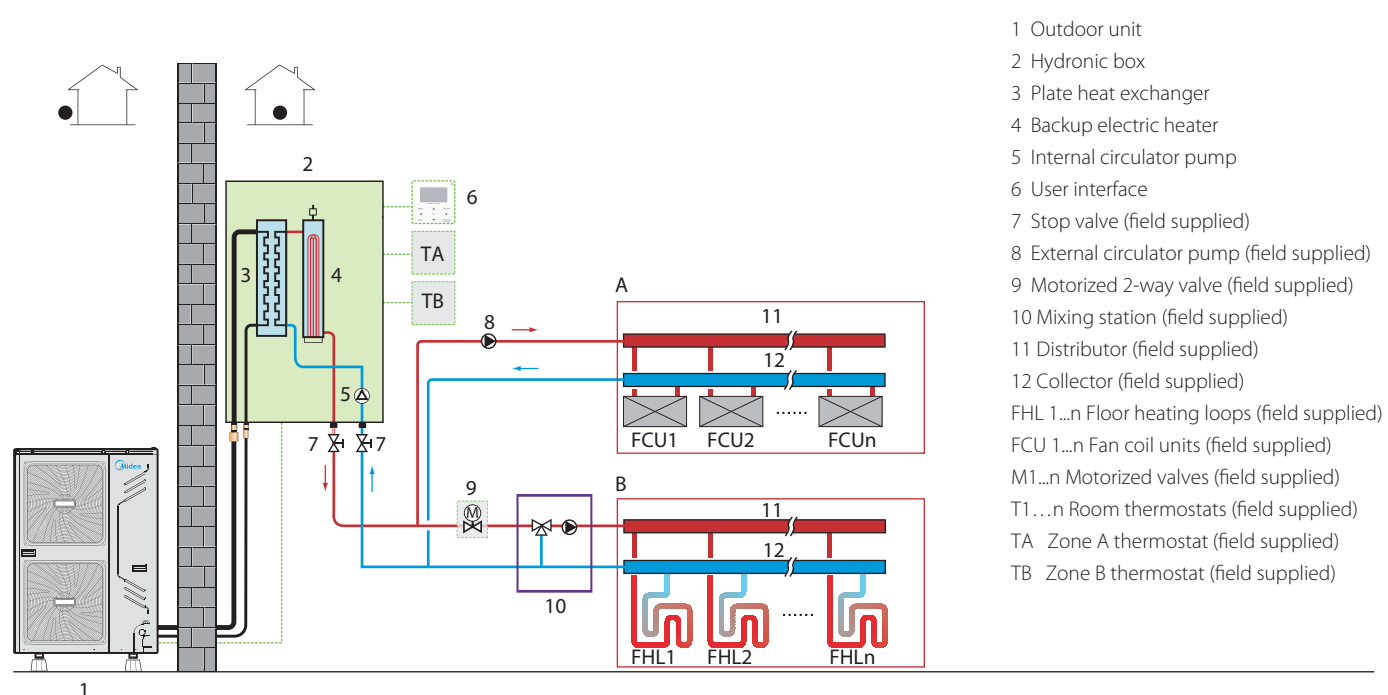
5-3 Auxiliary heat source provides additional heating

If the unit's outlet temperature is too low, the auxiliary heat source provides additional heating to raise the water temperature to the set temperature. An additional 3-way valve is required. When the unit's outlet temperature is too low, the 3-way valve is open and the water flows through the auxiliary heat source. When the unit's outlet temperature is high enough, the 3-way valve is closed.



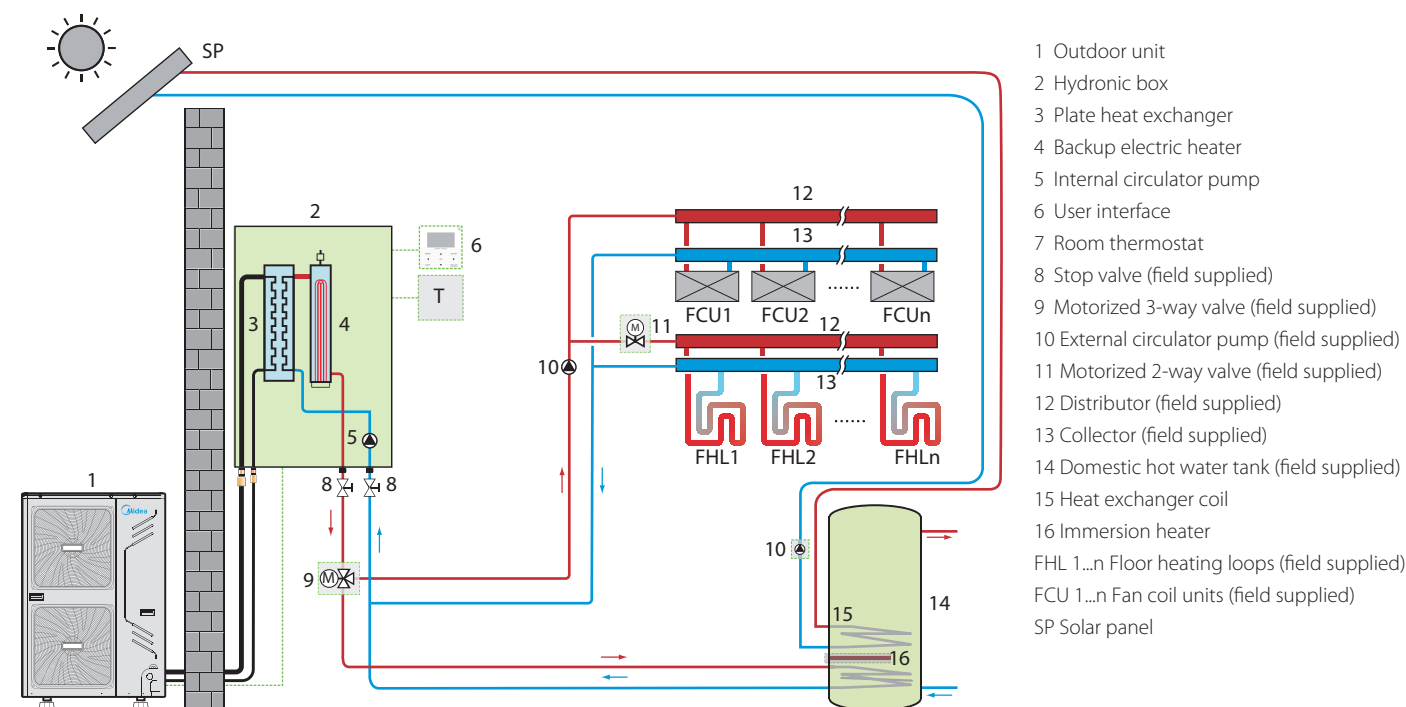
❖ Application 6: Space Heating Through Floor Heating Loops and Fan Coil Units

The floor heating loops and fan coil units require different operating water temperatures. To achieve these two set points, a mixing station is required. Room thermostats for each zone are optional.



❖ Application 7: Space Heating, Space Cooling and Domestic Hot Water Compatible with Solar Water Heater

Floor heating loops and fan coil units are used for space heating and fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to both the hydronic box and solar water heater. The unit switches to heating or cooling mode according to the temperature detected by the room thermostat. In space cooling mode, the 2-way valve is closed to prevent cold water entering the floor heating loops.



Specifications

M-Thermal Mono

Model name MHC-			V5W/D2N1	V7W/D2N1	V9W/D2N1	V10W/D2N1	V12W/D2N1	V14W/D2N1	V16W/D2N1	V12W/D2RN1	V14W/D2RN1	V16W/D2RN1
Power supply		V/Ph/Hz	220-240/1/50							380-415/3/50		
Heating²	Capacity	kW	4.58	6.55	8.67	10.43	12.17	14.76	16.33	12.37	14.10	16.30
	Rated input	kW	0.97	1.45	2.02	2.28	2.73	3.40	3.90	2.76	3.26	3.88
	COP		4.72	4.52	4.30	4.57	4.46	4.34	4.19	4.48	4.33	4.20
Heating³	Capacity	kW	4.67	6.69	8.62	10.17	12.58	14.08	16.12	12.02	14.11	16.06
	Rated input	kW	1.43	2.05	2.64	3.08	3.86	4.47	5.22	3.72	4.47	5.23
	COP		3.27	3.26	3.27	3.30	3.26	3.15	3.09	3.23	3.16	3.07
Cooling⁴	Capacity	kW	4.55	6.45	8.11	10.25	12.19	14.61	14.82	12.64	14.03	15.10
	Rated input	kW	1.00	1.47	2.08	2.06	2.65	3.32	3.66	2.75	3.26	3.78
	EER		4.55	4.40	3.90	4.98	4.60	4.40	4.05	4.60	4.30	4.00
Cooling⁵	Capacity	kW	4.55	6.71	8.09	10.44	12.21	12.95	13.72	12.58	13.80	15.26
	Rated input	kW	1.55	2.57	3.41	3.28	4.17	4.53	5.16	4.32	5.15	6.41
	EER		2.94	2.61	2.37	3.18	2.93	2.86	2.66	2.91	2.68	2.38
Seasonal space heating energy efficiency class⁶	LWT at 35°C		A++									
	LWT at 55°C		A++									
SCOP⁶	LWT at 35°C		4.47	4.53	4.16	4.12	4.21	4.39	4.26	4.45	4.27	4.17
	LWT at 55°C		3.29	3.29	3.25	3.25	3.25	3.25	3.2	3.25	3.27	3.22
SEER⁶	LWT at 7°C		3.2	3.39	4.52	4.49	4.42	4.29	4.01	4.39	4.46	4.52
	LWT at 18°C		4.43	4.87	5.69	6.22	6.64	6.18	5.88	5.78	5.72	6.19
Air flow		m³/h	3050	3050	3050	6150	6150	6150	6150	6150	6150	6150
Sound power level⁷	Heating	dB(A)	61	65	68	66	67	71	71	68	71	72
	Cooling	dB(A)	63	67	70	68	69	73	73	70	73	75
Net dimensions (W×H×D)		mm	1210×945×402				1404×1414×405			1404×1414×405		
Packed dimensions (W×H×D)		mm	1500×1140×450				1475×1580×440			1475×1580×440		
Net/Gross weight		kg	99/117				162/183			177/198		
Water piping connections		mm	Φ25 Female BSP				Φ32 Female BSP			Φ32 Female BSP		
Safety valve set pressure		MPa	0.3				0.3			0.3		
Total water volume		L	2.0				5.5			5.5		
Operating temperature range	Cooling	°C	-5 to 46									
	Heating	°C	-20 to 35									
	DHW	°C	-20 to 43									
LWT range	Cooling	°C	5 to 25									
	Heating	°C	25 to 60									
	DHW	°C	40 to 60									
Refrigerant	Type		R410A									
	Charged volume	kg	2.4	2.4	2.4	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Throttle type			Electronic expansion valve				Electronic expansion valve			Electronic expansion valve		
Backup electric heater	Standard mounted	kW	-	-	-	3.0	3.0	3.0	3.0	4.5	4.5	4.5
	Optional	kW	3.0	3.0	3.0	4.5	4.5	4.5	4.5	-	-	-
	Capacity steps		1	1	1	2	2	2	2	1	1	1

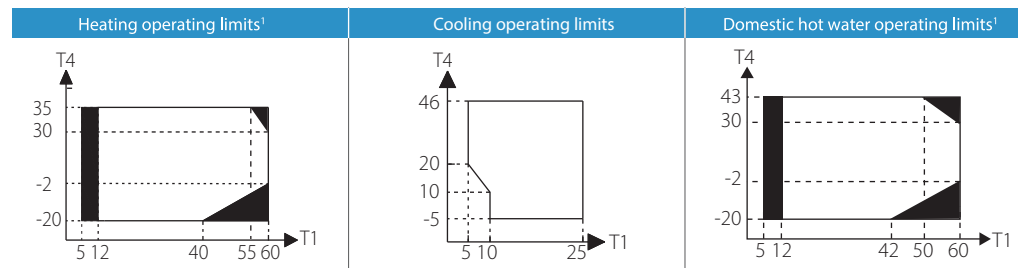
Notes:

1. Relevant EU standards and legislation: EN14511:2013; EN14825:2013; EN50564:2011; EN12102:2011; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02.
2. Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
3. Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
4. Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C.
5. Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C.
6. Seasonal space heating energy efficiency class tested in average climate conditions.
7. Sound power level tested in average climate conditions, heating: outdoor air temperature 7°C DB, 6°C WB; EWT 47°C, LWT 55°C; cooling: outdoor air temperature 35°C DB, 24°C WB; EWT 12°C, LWT 7°C.

Abbreviations:

DHW: Domestic hot water
EWT: Entering water temperature
LWT: Leaving water temperature

Operating Limits



Abbreviations:
T4: Outdoor temperature(°C)
T1: Leaving water temperature (°C)

Notes:
1. Shaded areas indicate no heat pump operation (backup electric heater or auxiliary heat source only)

M-Thermal Split

Model name MHA-				V4W/D2N1	V6W/D2N1	V8W/D2N1	V10W/D2N1	V12W/D2N1	V14W/D2N1	V16W/D2N1	V12W/D2RN1	V14W/D2RN1	V16W/D2RN1
Power supply			V/Ph/Hz	220-240/1/50							380-415/3/50		
Heating ²	Capacity	kW	4.04	6.10	8.00	10.00	12.10	14.20	15.40	12.10	14.10	15.50	
	Rated input	kW	0.82	1.32	1.74	2.17	2.74	3.46	3.79	2.68	3.27	3.71	
	COP		4.94	4.63	4.61	4.61	4.42	4.10	4.06	4.51	4.31	4.18	
Heating ³	Capacity	kW	4.00	6.00	7.34	10.00	11.80	14.00	16.00	11.90	13.90	15.50	
	Rated input	kW	1.18	1.74	2.15	2.92	3.48	4.39	5.02	3.48	4.21	4.87	
	COP		3.40	3.45	3.42	3.42	3.39	3.19	3.19	3.42	3.30	3.18	
Cooling ⁴	Capacity	kW	4.10	6.20	8.00	10.50	11.70	13.10	13.80	12.00	13.50	14.50	
	Rated input	kW	0.84	1.43	1.93	2.30	2.79	3.48	3.77	2.80	3.45	3.94	
	EER		4.88	4.34	4.15	4.57	4.19	3.76	3.66	4.29	3.91	3.68	
Cooling ⁵	Capacity	kW	4.00	5.83	6.30	9.30	11.00	12.50	12.80	12.00	13.20	13.30	
	Rated input	kW	1.26	2.05	2.25	3.26	4.17	5.17	5.38	4.53	5.32	5.54	
	EER		3.17	2.84	2.80	2.85	2.64	2.42	2.38	2.65	2.48	2.40	
Seasonal space heating energy efficiency class ⁶			Water outlet LWT at 35°C		A++								
			Water outlet LWT at 55°C		A++	A++	A++	A+	A++	A++	A+	A++	A++
Sound power level ⁷	Heating	dB(A)	62	66	69	67	68	71	72	70	72	72	
Net dimensions (WxHxD)		mm	960x860x380			1075x965x395			900x1327x400			900x1327x400	
Packed dimensions (WxHxD)		mm	1040x1000x430			1120x1100x435			1030x1457x435			1030x1457x435	
Net/gross weight		kg	60/72			76/88		99/112			115/126		
Compressor	Type		Twin-rotary inverter										
Outdoor fan	Type		Brushless DC motor										
	Air flow	m³/h	3180			5116		6250			6250		
Air side heat exchanger			Fin-coil										
Piping connections	Liquid	Type	Flaring										
		Dia.(OD)	mm		Φ9.5								
	Gas	Type	Flaring										
		Dia.(OD)	mm		Φ15.9								
	Piping length	Min.	m	2		2		2			2		
		Max.	m	20		30		50			50		
	Installtion height	Outdoor unit above	m	10		20		30			30		
Outdoor unit below		m	8		15		25			25			
Refrigerant	Type		R410A										
	Factory charge	kg	2.5			2.8		3.9			4.2		
Throttle type			Electric expansion valve										
Operating temperature range	Cooling	°C	-5 to 46										
	Heating	°C	-20 to 35										
	DHW	°C	-20 to 43										

Notes:

1. Relevant EU standards and legislation: EN14511:2013; EN14825:2013; EN50564:2011; EN12102:2011; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02.
2. Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
3. Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
4. Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C.
5. Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C.
6. Seasonal space heating energy efficiency class tested in average climate conditions.
7. Sound power level tested in average climate conditions, outdoor air temperature 7°C DB, 6°C WB; EWT 47°C, LWT 55°C.

Abbreviations:

DHW: Domestic hot water
EWT: Entering water temperature
LWT: Leaving water temperature



Hydronic box

Hydronic box		Model		SMK-80/CD30GN1-B	SMK-160/CD30GN1-B	SMK-160/CSD45GN1-B
		Compatible outdoor unit model names MHA-		V4(6, 8)W/D2N1	MHA-V10/12/14/16W/D2N1	MHA-V12/14/16W/D2RN1
Function				Heating and cooling		
LWT range	Space heating	Low	°C	25 to 55		
		High	°C	35 to 60		
	Space cooling	Low	°C	7 to 25		
		High	°C	18 to 25		
	DHW			°C	40 to 60	
Power supply			V/Ph/Hz	220-240/1/50	220-240/1/50	380-415/3/50
Sound power level ¹			dB(A)	42	45	45
Dimension (WxHxD)			mm	400x865x427		
Packing (WxHxD)			mm	495x1040x495		
Net/gross weight			kg	51/57	54/60	53/59
Water circuit	Piping connections		mm	DN25		
	Safety valve set pressure		MPa	0.3		
	Total water volume		L	5		
	Drainage pipe		mm	Φ16		
	Expansion tank	Volume	L	3		
		Max. water pressure	MPa	0.8		
		Pre pressure	MPa	0.15		
	Water side heat exchanger	Type		Plate		
		Volume	L	0.7	1	1
Water pump head			m	6	7.5	7.5
Refrigerant circuit						
Liquid side			mm	Φ9.5		
Gas side			mm	Φ15.9		
Backup electric heater	Size		kW	3.0	3.0	4.5
	Step			2	2	2
	Power supply			220-240/1/50	220-240/1/50	380-415/3/50

Notes:
1. Sound power level tested in average climate conditions, outdoor air temperature 7°C DB, 6°C WB; EWT 47°C, LWT 55°C.

Abbreviations:
DHW: Domestic hot water
EWT: Entering water temperature
LWT: Leaving water temperature

Operating Limits

