Aqua Eco Mini Heat Pump
Low-carbon lifestyle

5~16kW

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 m³) for container-carrying capacity optimization
 (For reference: 76 units within one 40HQ container)
Smaller floor space (0.4M²) for flexible installation

Heating, cooling, hot water, one-stop solution

 -5℃ low ambient cooling function

R32 eco-friendly refrigerant with low carbon emission

INVERTER 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 additonal heating capactiy;

Complete isolation between water and electricity;

780

280 220

Air purge

Backup heater

Water inlet

Water outlet

Ambient temperature range

Leaving water temperature setting range

65℃

43℃

35℃

25℃

25℃

5℃

-5℃

-25℃

70℃ 60℃ 50℃ 40℃ 30℃ 20℃ 10℃ 0℃ -10℃ -20℃ -30℃

Heating   Cooling   Heating   Cooling
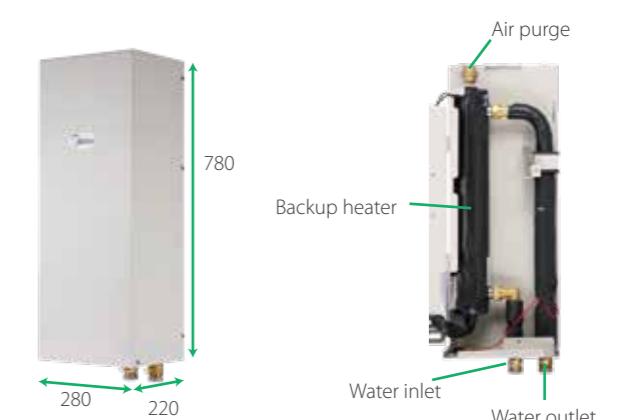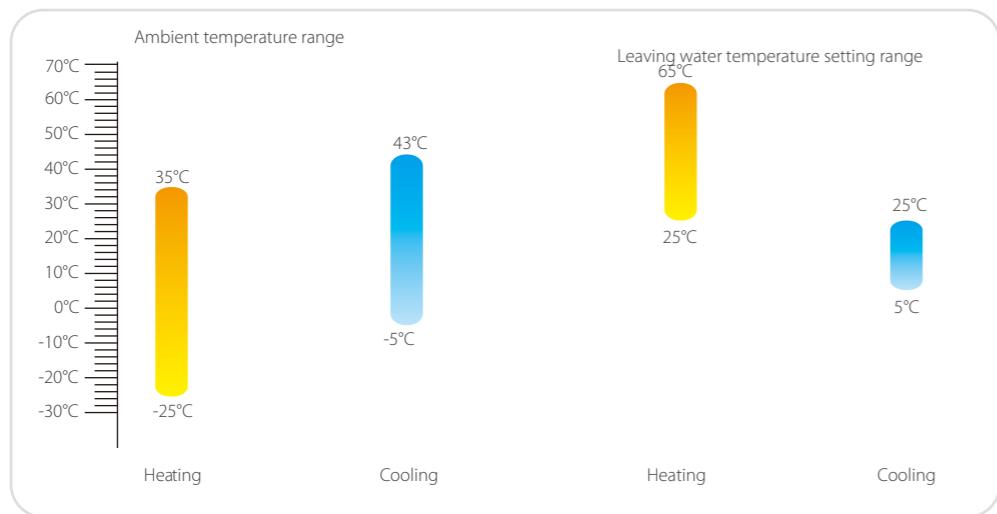
Mini size

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

Manual defrost

During heating/DHW mode, frost is gernated 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.

Heating/DHW mode   Defrost mode/Manual defrost

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.
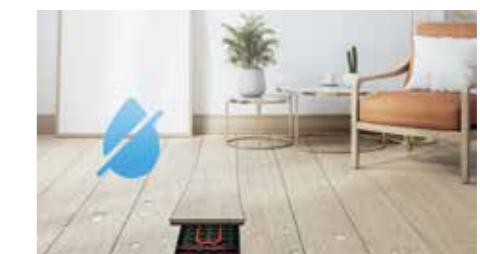
Power limitation function

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.
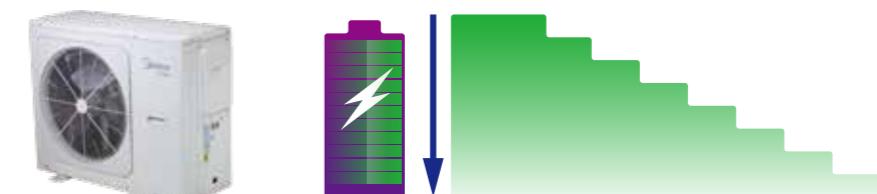
Holiday away

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.

Normal operation

Leaving water temperature(LWT)

Low LWT heating or DHW modeto prevent freezeing at holiday time

Disinfect

Holiday away

Time
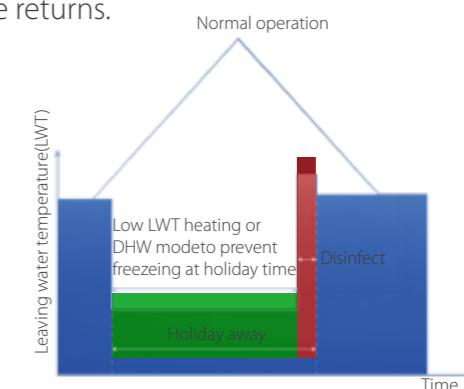
Smart control

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.

Target outlet water temperature (°C)

T1SET1

T1SET2

Ambient temperature (°C)

T4SET1   T4SET2
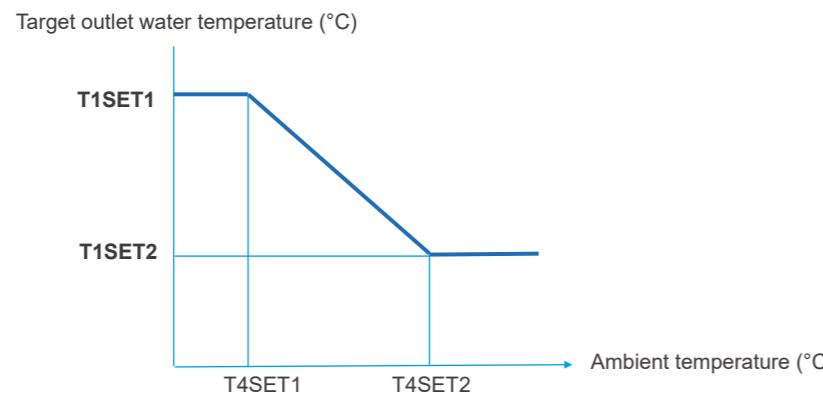
Smart Grid

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 protocal 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.

D1
D2
E
X1/HB
X2/HA
L1
A B X/HA Y/HB E
P Q E1 H1 H2
Hydro system PCB

H1 H2

Wired controller
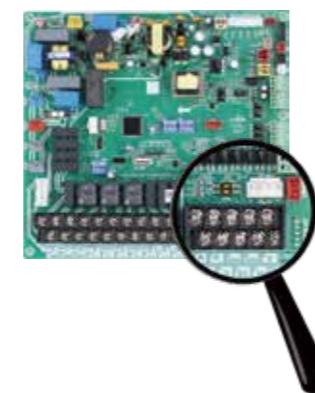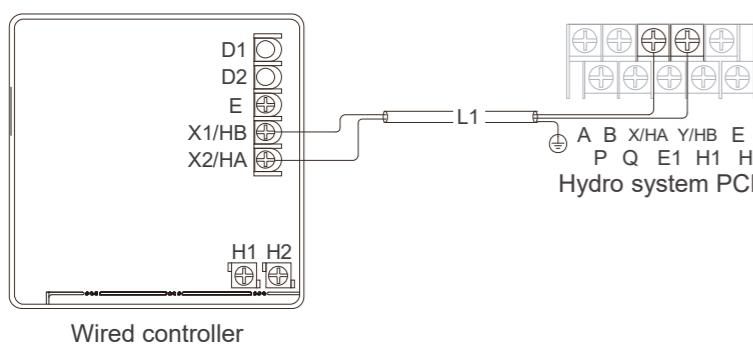
External control box

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.

Connection cable

External electric heater

External hydro control box
(Optional)

Communication cable

Additional heating source
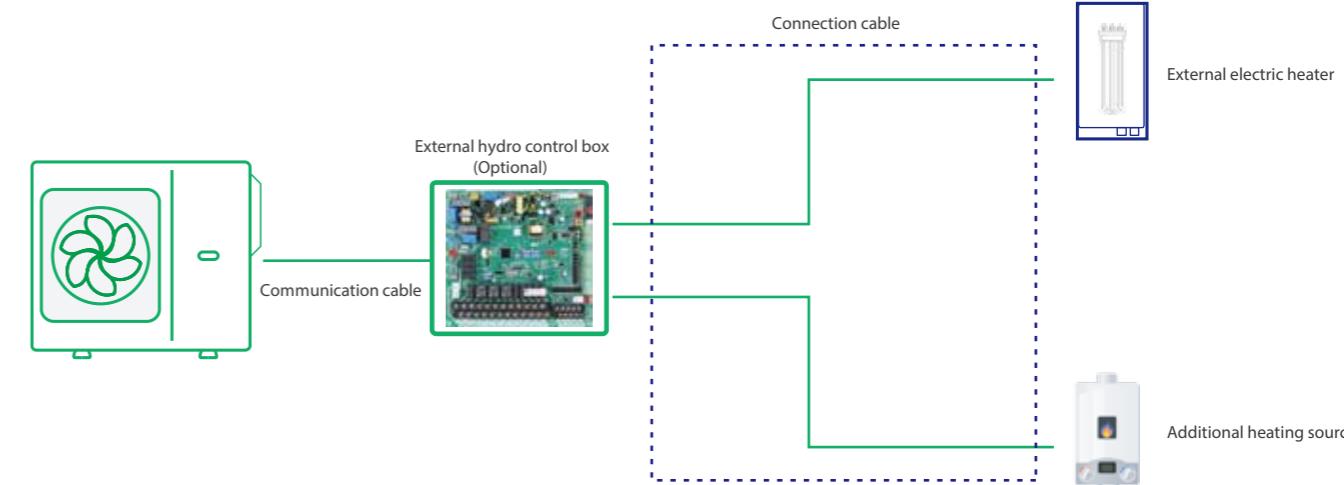
Convenient

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 senor and wifi module
- Modbus protocol and network flexibility

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

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

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

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.

Capacity

Configuration 1

Configuration 2

Configuration 3

Required capacity

Heat pump capacity

Ambient temperature

Lowest temperature
(Design temperature)

Equilibrium
points

Highest temperature
(No more heating)
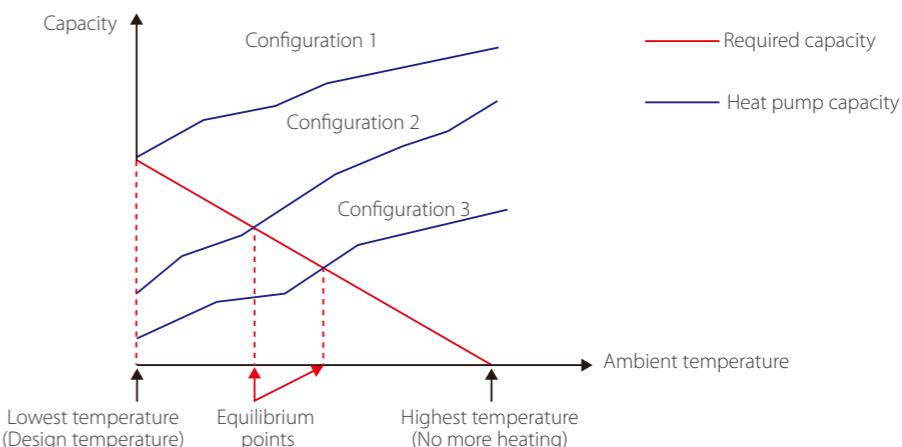
Configuration 1: Heat pump only

- ❖ 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

| Step 1: Total heat load calculation | Calculate conditioned surface area and select the heat emitters (type, quantity, water temperature and heat load) |

| Step 2: System configuration | Decide whether to include AHS and set AHS's switching temperature. Decide whether backup electric heater is enabled or disabled |

| Step 3: Selection of outdoor units | Determine required total heat load on outdoor units. Set capacity safety factor. Select M thermal type (Mono/Split). Select power supply |

Provisionally select M thermal unit capacity based on nominal capacity

Correct capacity of the outdoor units for the following items: Outdoor air temperature / Outdoor humidity / Water outlet temperature/ Altitude

Is corrected M thermal unit capacity ≥ Required total heat load on outdoor units

YES → M thermal system selection is complete

NO → Select a larger model or enable backup electric heater operation

Leaving Water Temperature (LWT)

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

Typical application

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

Mono
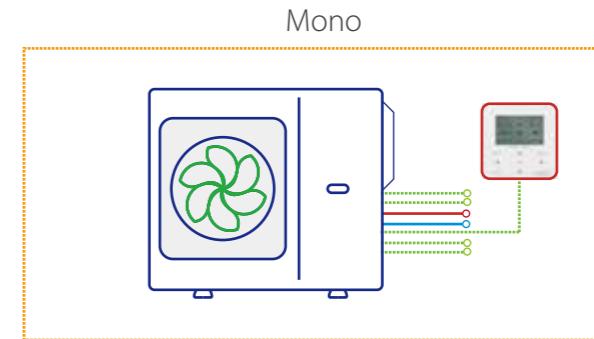
Heating and cooling

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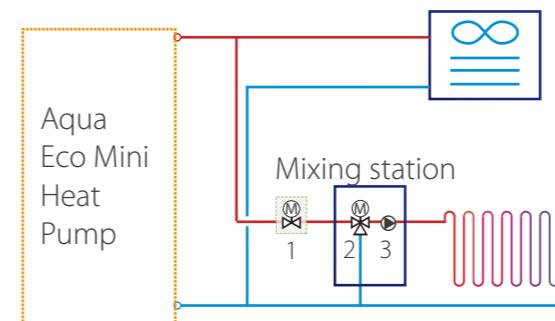
Notes:
1. 2-way valve (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)

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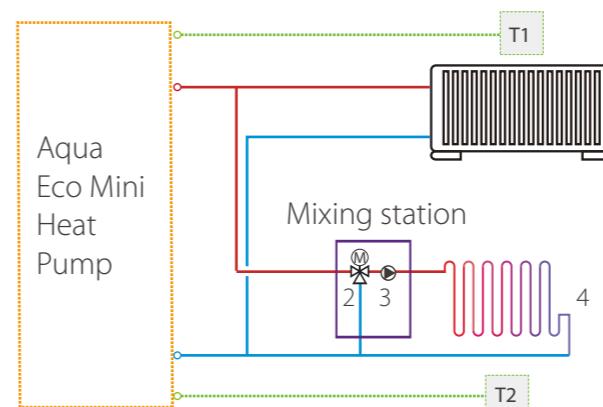
Notes:
1. Radiator (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Floor heating loop (field supplied)

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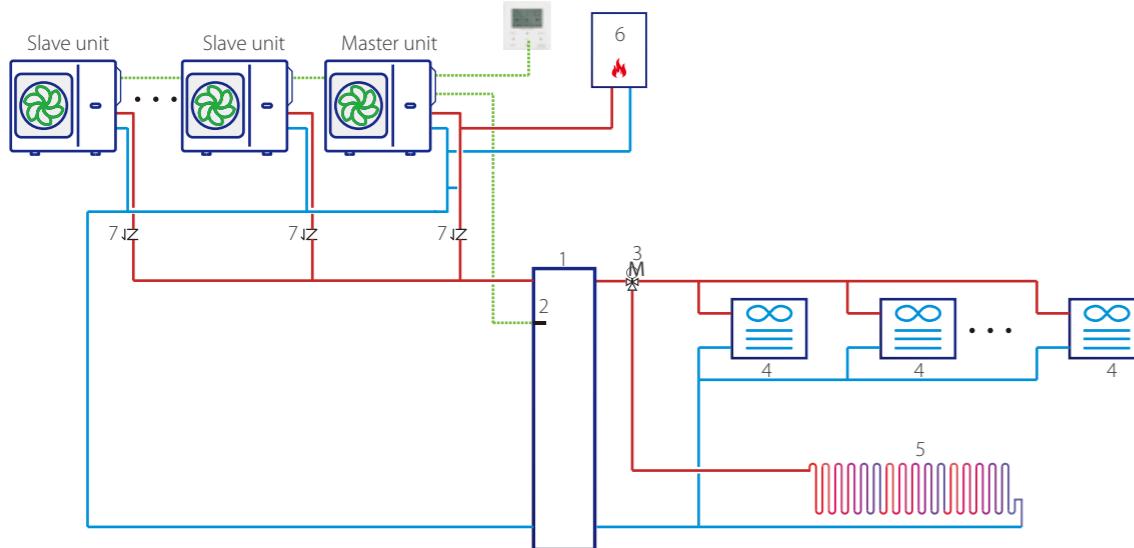
Notes:
1. Balance tank (field supplied)
2. Balance tank temperature sensor (Midea can supply)
3. 3-way valve (field supplied)
4. Fan coil unit (Midea can supply)
5. Floor heating loop (field supplied)
6. AHS: Additional heating source (field supplied)
7. Single way valve (field supplied)

Aqua Eco Mini Heat Pump

Outdoor unit model			MGC-V5WD2N8-B	MGC-V7WD2N8-B	MGC-V9WD2N8-B	MGC-V12WD2N8-B
Cooling[1]	Capacity	W	5500	7400	9000	11600
	Rated input	W	1692	2349	3103	3742
	EER		3.25	3.15	2.90	3.10
Heating[2]	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[3]		dB	60	63	65	70
Net dimension (H×W×D)		mm	865×1040×410			
Packing dimension (H×W×D)		mm	970×1190×560			
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[4] Optional	Standard mounted	kW	/			
	Optional	kW	3/4.5/6/9			
	Capacity steps		1/1/2/3			
	Power supply	3		220-240/1/50			
		4.5		220-240/1/50			
		4.5	V/Ph/Hz	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[1]	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[2]	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[3]		dB	72	72	70	72	72
Net dimension (H×W×D)		mm	865×1040×410				
Packing dimension (H×W×D)		mm	970×1190×560				
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	℃	-5 ~ 43				
	Heating	℃	-25 ~ 35				
LWT setting range	Cooling	℃	5 ~ 25				
	Heating	℃	25 ~ 65				
Backup E-heater[4] 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℃ DB; Water inlet 12℃, Water outlet 7℃.
2. Outdoor air temperature 7℃ DB, 6℃ WB; Water inlet 40℃, Water outlet 45℃.
3. Testing standard: EN12102-1.
4. Backup electric heater is external installation.

M thermal Accessory(Optional)

3-way valve

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

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

Thermostat

Mactch table				Thermostat description
Midea AC 2nd generation Ceiling & Floor		KJR-18B/E		Mechanical thermostat
				Mode control
Midea AC/DC Duct				Fan speeds control
				Temp. setting
Midea AC/DC Cassette		KJR-29B		Receiving remote signal
				Mode control
				Fan speeds control
Midea Wall-mounted				Temp. setting
Midea DC 2nd generation Ceiling & Floor		KJRP-75A/BK		LED display screen
				Mode control
				Seven speed fan control
Midea DC one-way cassette				Temp. setting
Midea AC 2nd generation Ceiling & Floor		KJRP-86I/MFK-E		LED display screen
				Mode control
				Fan speeds control
Midea AC/DC Duct				Temp./Timer setting
				ECO setting/reminder
Midea AC 2nd generation Ceiling & Floor		KJRP-86A/BMFNKD-E		LED display screen
				Mode/Electric heater control
				Fan speeds control
				Temp./Timer setting
Midea AC/DC Duct				ECO setting/reminder
				Compatible with Modbus