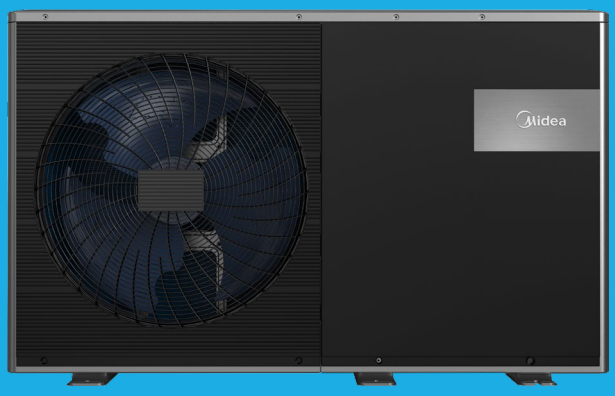
M THERMAL ARCTIC R290 HEAT PUMP

Quick Guide



OFFICIAL PARTNER

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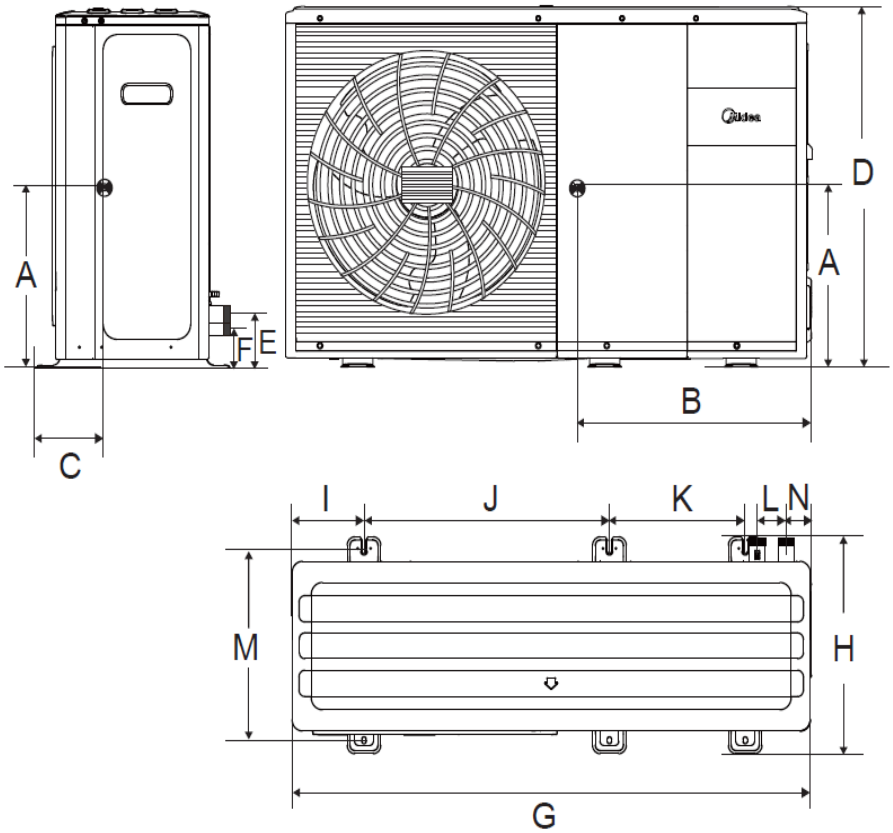


The illustrations are for 8-16 kW units. The principle is the same for 4 – 5kW units. A, B and C indicate the locations of barycentre.

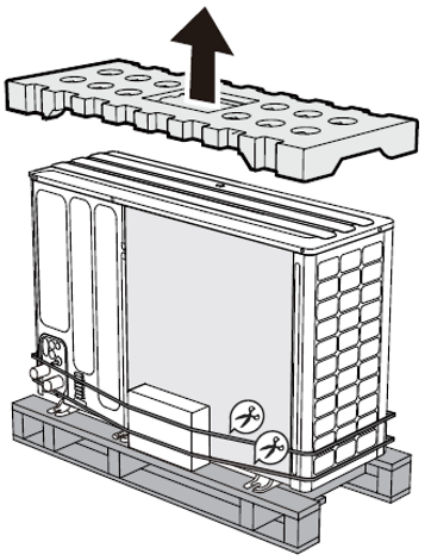
(mm)

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1 phase 4/6 kW	333	528	210	717	91	91	1299	426	121	644	379	90	375	71
1 phase 8/10 kW	360	550	234	865	129	100	1385	523	192	656	363	77	456	68
1 phase 12/14/16 kW	415	715	200	865	129	100	1385	523	192	656	363	77	456	68
3 phase 12/14/16 kW	415	715	200	865	129	100	1385	523	192	656	363	77	456	68

Preparing the unit

When the unit is delivered there is a blue cover taped over the coil which needs to be removed.

1



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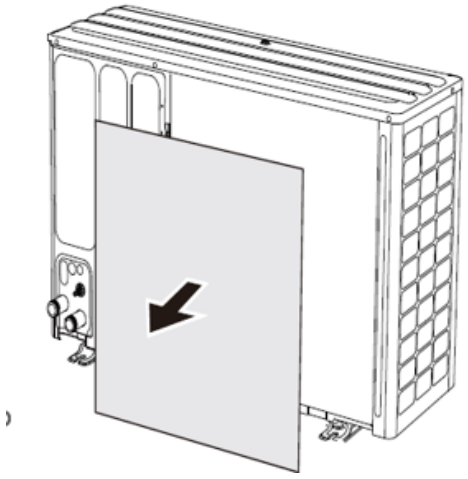

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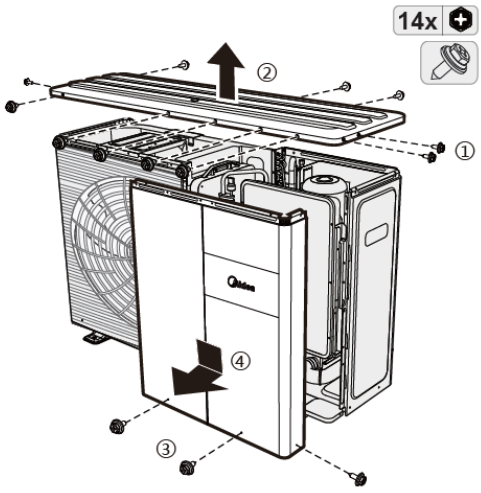

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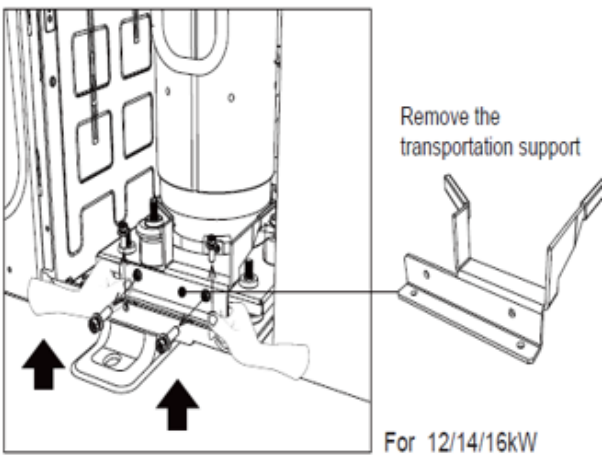


What is in the box

Controller, Y strainer, DHW sensor, condensate adapter, manuals, & energy efficiency (ERP) label.

On the larger 12-16kW units, the compressor has a plate which must be removed prior to installation. See above.

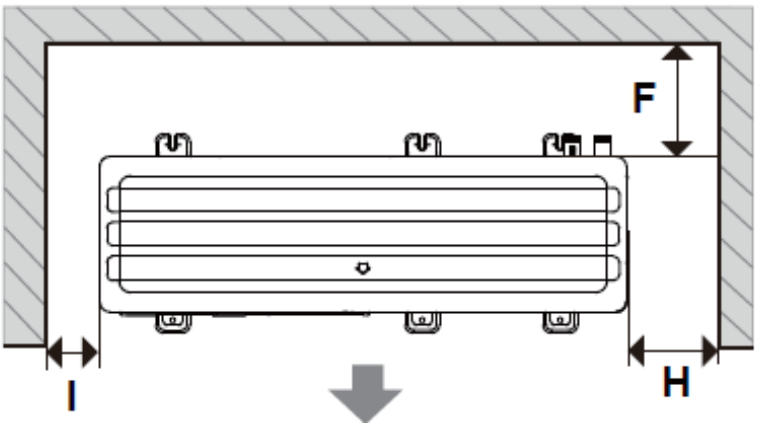
Where to install the unit

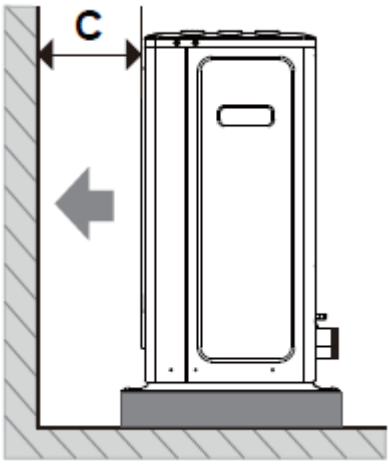
Installing the Outdoor Unit

Position the outdoor unit so that the air flows into an open area, where there are no plants and animals. If the unit is to be installed within a mile of the sea, you need to have the unit coated using Bronz-glow. Ask us for details. If you are applying for Boiler Upgrade Scheme and going through MCS, you need to make sure the system passes MIS020 sound test.

Install the unit on a flat, stable surface. It needs to be securely mounted at least 100mm off the ground. You must use three anti-vibration feet or mounts.

The unit must have adequate drainage. It can produce up to 6.75 L per hour of condensate water. If you are installing the unit at height, you can install a drain pan under the unit. The flow of condensation must be piped to a safe point of disposal.





4-10 kW **(mm)**

A	Unit height + B	D	≥500	G	≥500
B	≥100*	E	≤500	H	≥500
C	≥1000	F	≥300	I	≥500

12-16 kW

A	Unit height + B	D	≥500	G	≥500
B	≥100*	E	≤500	H	≥500
C	≥1500	F	≥300	I	≥500

Where to install the unit

SAFETY ZONE

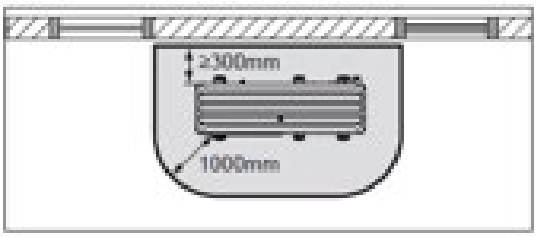
The refrigerant circuit in the outdoor unit contains easily flammable refrigerant in safety group A3 as described in ISO 817 and ANSI/ASHRAE Standard 34. Therefore, a safety zone is defined in the immediate vicinity of the outdoor unit, in which special requirements apply. Note that this refrigerant has a higher density than air. In the event of a leak, escaping refrigerant may be collected near the earth.

The following conditions must be avoided within the safety zone:

- Building openings such as windows, doors, light wells, and flat roof windows
- Outdoor air and exhaust air apertures of ventilation and air conditioning systems
- Property boundaries, neighbouring properties, footpaths, and driveways
- Pump shafts, inlets to waste water systems, downpipes, and waste water shafts, ect.
- Other slopes, troughs, depressions and shafts
- Electrical house supply connections
- Electrical systems, sockets, lamps, and light switches; snowfall from roofs

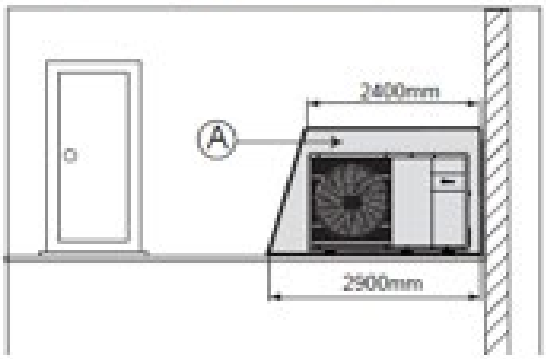
Do not introduce ignition sources into the safety zone:

- Naked flames or burner gauze assemblies
- Grills
- Tools that generate sparks
- Electrical device not free of ignition sources, mobile devices with integrated batteries (such as mobile phones and fitness watches)
- Objects with a temperature of above 360˚C



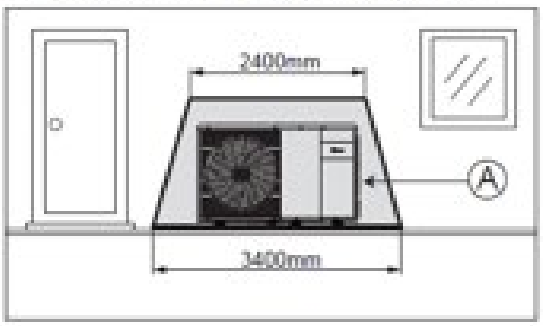
Ⓐ Safety zone

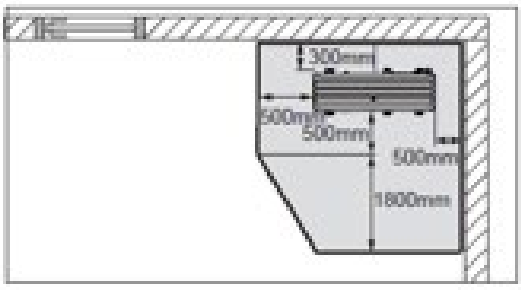
Corner positioning of the outdoor unit, left



Ⓐ Safety zone

Siting the outdoor unit in front of an external wall





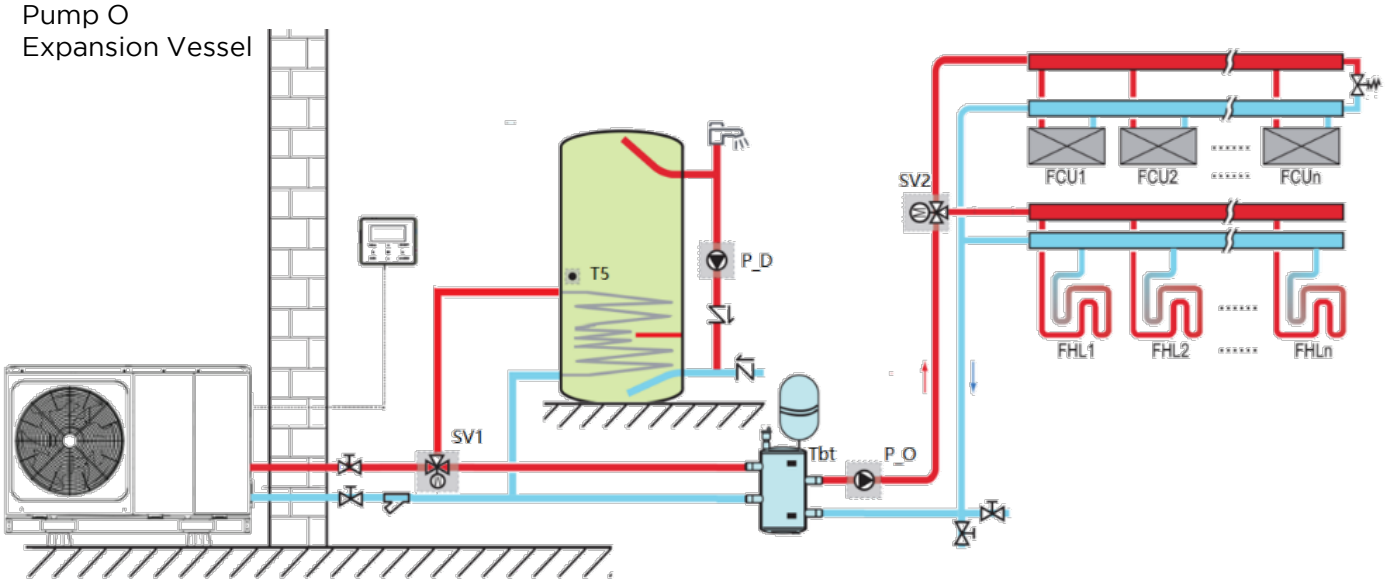
Heating & hot water schematic

Minimum Water Volume
Check and ensure that the total water volume in the installation is at least 40 litres, excluding the internal water volume of the outdoor unit.

Flow Rate Range
The operation flow rate range of the unit is shown as below. Check and ensure that the flow rate in the installation is guaranteed in all conditions.

Unit	4kW	6kW	8kW	10kW	12kW	14kW	16kW
Flow rate range (m^3/h)	0.4~0.9	0.4~1.25	0.4~1.65	0.4~2.10	0.7~2.50	0.7~2.75	0.7~3.00

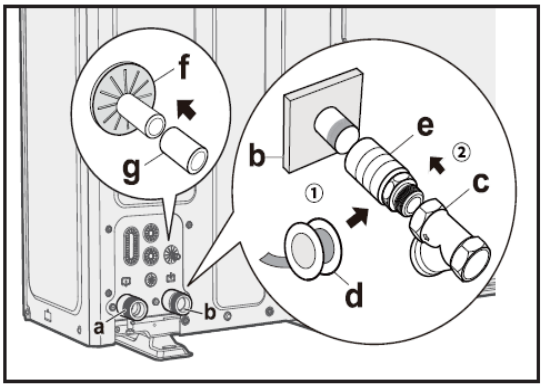
Heat Pump
Flexi Hose
Isolation valves
Y strainer (Isolation on both sides)
3 Port Valve
DHW Cylinder
Buffer/Volumizer
Pump O
Expansion Vessel



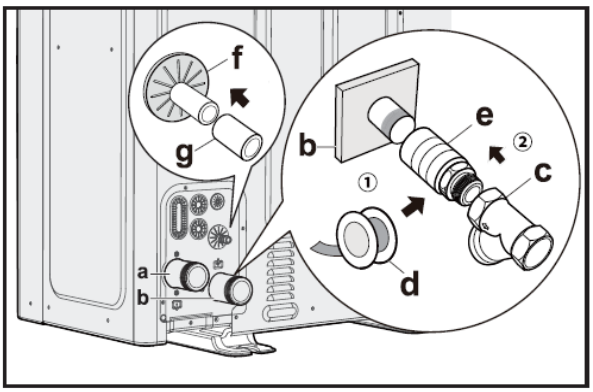
Notes & Midea UK Disclaimer:
This drawing is supplied for Information only and general guidance. No responsibility is accepted for any errors or omissions contained within or for any cost incurred in rectifying any work relating to it. Drain off points and AAV's to be fitted where appropriate, all applicable laws and regulations must be followed. Always refer to manufacturer's manual for installation instructions. Existing heating distribution pipe work and emitters must be power flushed before the heat pump and ancillaries are connected to the system. To ensure the minimum flow rates are maintained at all times even whilst there is low heating demand, a low loss header, buffer tank or automatic bypass valve(s) must be fitted into the circuit. Minimum volume refers to primary loop. Requirements must be met to ensure correct operation and could affect your warranty if not met, volume is achieved using a buffer tank, or a volumizer in primary loop. Volume can also be achieved using the emitter circuit when installing on an open loop system.

Piping and cable entries

4-6 kW



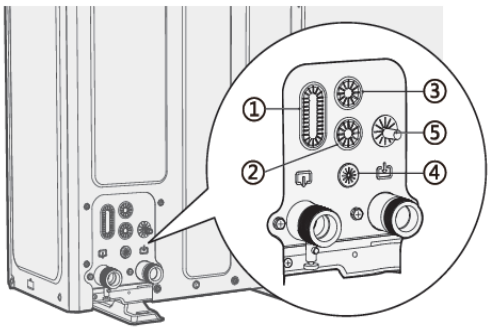
8-16 kW



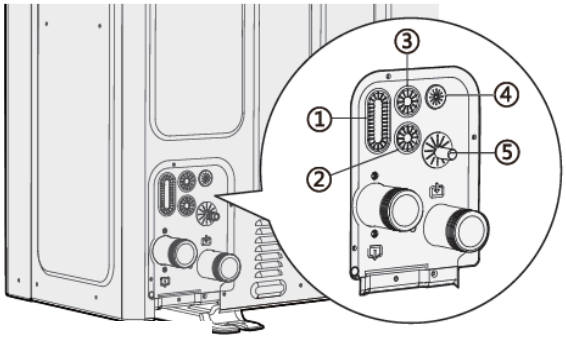
a	Water OUTLET (connection with screws, male, 1" for 4/6 kW units and 1 1/4" for 8-16 kW units)
b	Water INLET (connection with screws, male, 1" for 4/6 kW units and 1 1/4" for 8-16 kW units)
c	Y-shaped strainer (delivered with the unit) (2 screws for connection, female, 1" for 4/6 kW units and 1 1/4" for 8-16 kW units)
d	Thread seal tape
e	Extension pipe (recommended, with the length depending on the field conditions)
f	Safety valve outlet (hose, φ16mm)
g	Drain hose (supplied on the site)

The pump in the unit is an 8.5 meter head pump. You must ensure your system design can provide the flow rates required using this pump as it is not possible to fit additional pumps to the primary circuit.

4-6 kW



8-16 kW



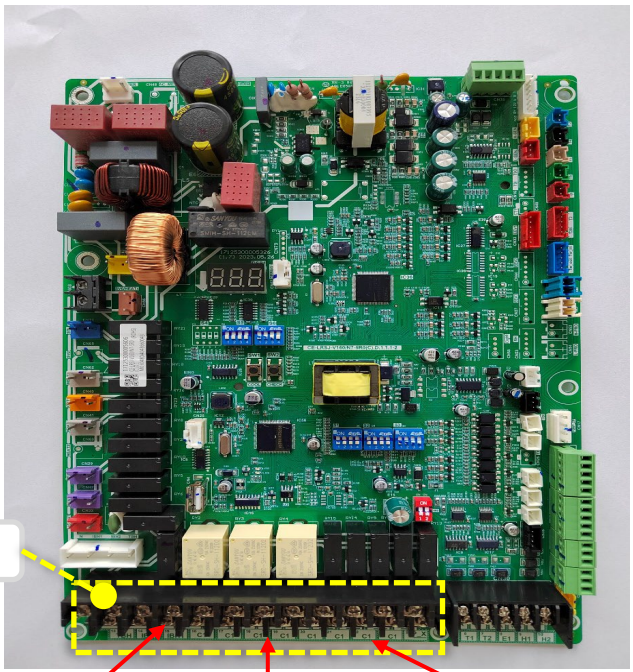
①②③	For high voltage wiring.
④	For low voltage wiring.
⑤	Safety valve drain.

Wiring Schematic

Unit	Power Supply	Max circuit current (A)	Min wire size (mm²)
4kW	220-240V - 50Hz	15	(2+PE) x (2.5-4)
6kW		15	(2+PE) x (2.5-4)
8kW		19	(2+PE) x (4-6)
10kW		19	(2+PE) x (4-6)
12kW		31	(2+PE) x (6-10)
14kW		31	(2+PE) x (6-10)
16kW		31	(2+PE) x (6-10)
12kW 3PH	380-415V 3N - 50Hz	11	(4+PE) x (2.5-4)
14kW 3PH		11	(4+PE) x (2.5-4)
16 Kw 3PH		11	(4+PE) x (2.5-4)

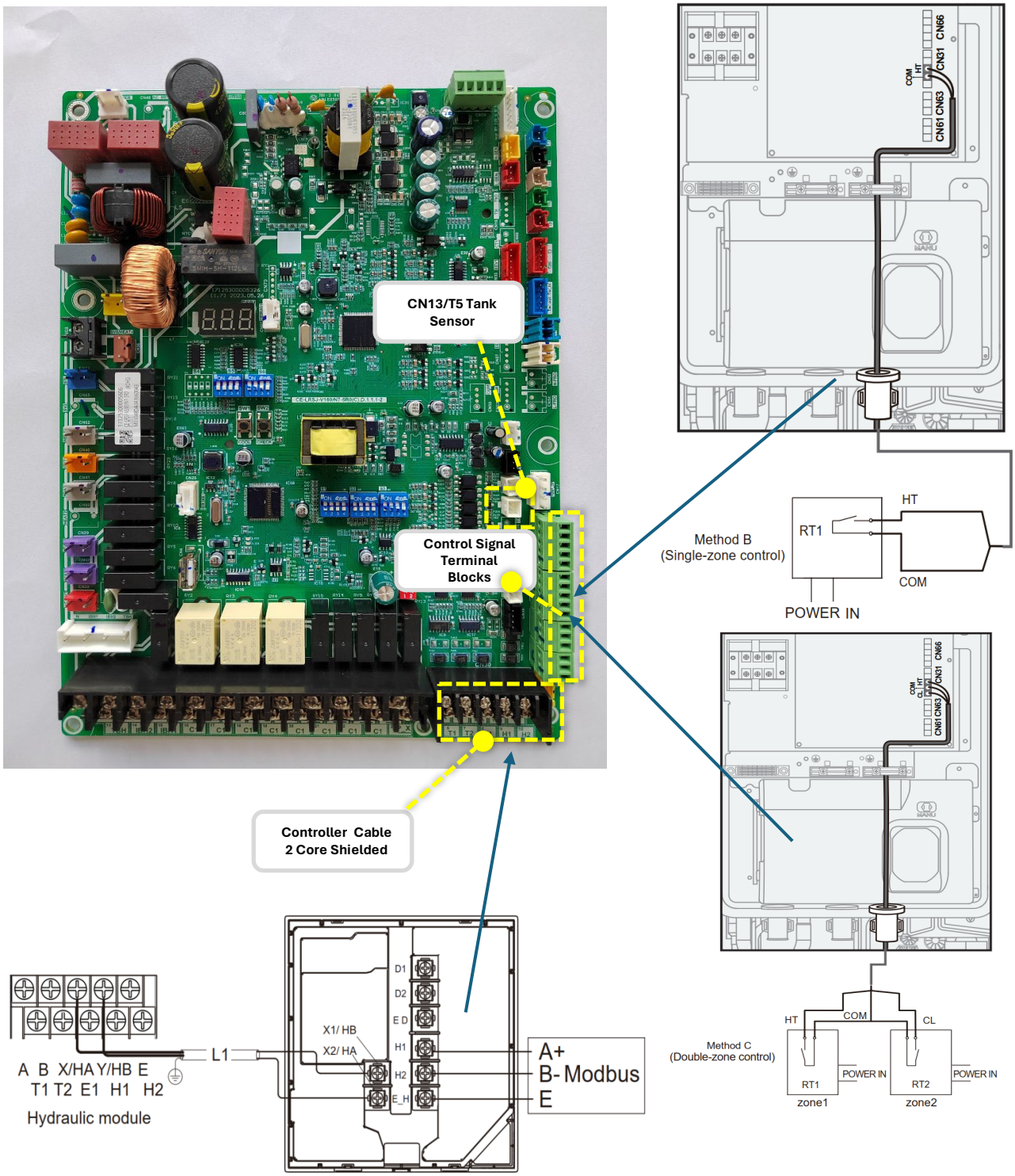
Voltage	220-240VAC
Max running current (A)	0.2
Min wire size	0.75
Control port signal type	Type 2

Note – If the current of load is smaller than 0.2A, load can connect to the port directly. If the load current is larger than or equal to 0.2A, it is necessary to connect the AC contactor to the load.



Wiring Schematic

Room Temperature – Single Zone Control
This input is a dry/volt Free contact. If you require a 230v output, then a 230v coil relay with NO contact is required.



How it's going to work

Space Heating

The heat pump has its own built in weather compensation function and it will look for a heating run signal from an external thermostat, underfloor heating controls, or your heating zone valves (field supplied) after the header/buffer/Plate heat exchanger.

Room Thermostat

Midea controller can be used as a room thermostat, but most installers will use a third-party controller, once a third-party controller is wired into the system this will make the Midea controller redundant as a room thermostat, you will only be able to alter the flow temperature and adjust the DHW.

Wiring information below.

Low Voltage CN31 Common & HT
Normally closed when calling for heat
For 230V stats a **RELAY IS REQUIRED.**

Domestic Water Heating

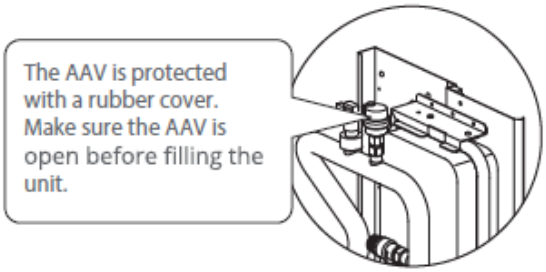
The target DHW cylinder temperature is set on the Midea remote controller. The Midea unit will automatically reheat the cylinder when the water temperature drops 5 degrees or more below target temperature. When in hot water mode pump PO will stop and the 3 port valve SV1 will power open.

Pre-commissioning

Filling it with water

Connect the water supply to the fill valve and open

Make sure all automatic air vents are open. There is one on the outdoor unit inside a rubber cover, on the top right-hand side of the unit.



Fill with water to approximately 2.0 bar pressure. Remove air in the circuit as much as possible using the air vents. Air in the water circuit will cause reduced flow rate and potential E8 and E0 errors.

Ensure adequate anti-freeze protection is used i.e Glycol / anti-freeze valves. Inhibitors and biocides may also be required.

Setting up the cylinder immersion heater

To ensure the unit has adequate legionella protection, the immersion heater will run for 2 hours a week controlled by an external time clock. On the immersion heater make sure the internal thermostat is set above 60˚C.

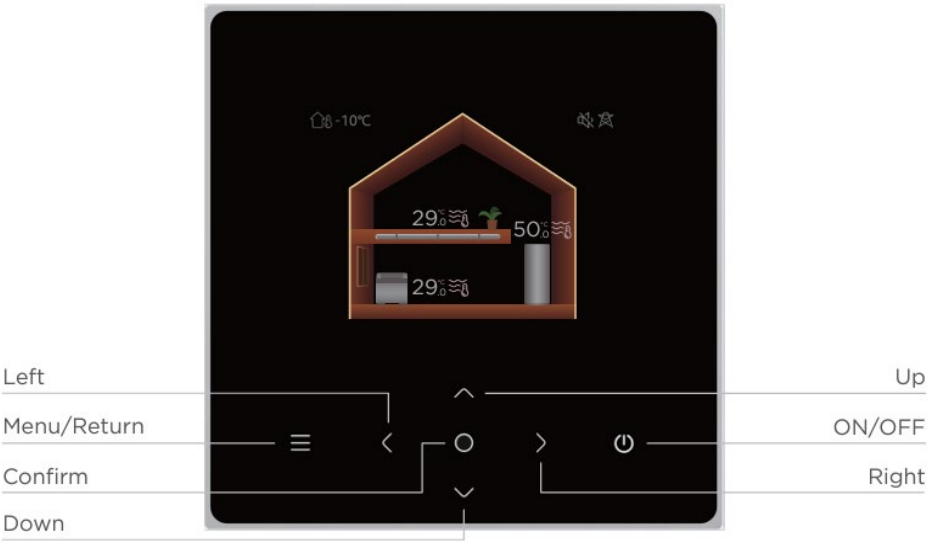
After powering on the unit, check the following items:

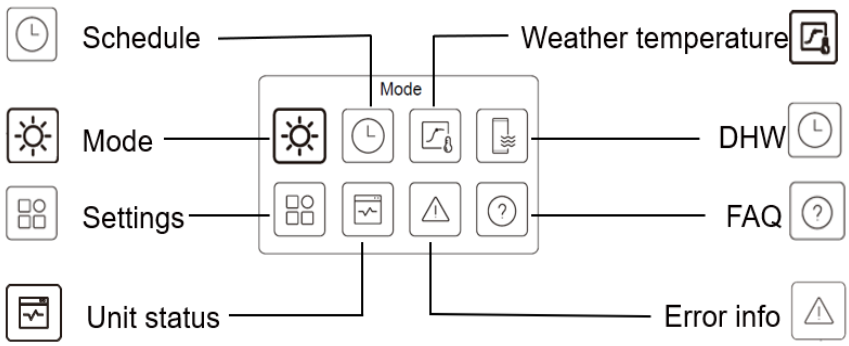
☐	**Upon power-on of the unit, nothing is displayed on the wired controller:** Check the following abnormalities before diagnosing possible error codes. - Wiring connection issue (power supply or communication signal). - Fuse failure on PCB.
☐	**Error code "E8" or "E0" is displayed on the wired controller:** - Residual air exists in the system. - The water level in the system is insufficient. Before starting test run, make sure that the water system and the tank are filled with water, and air is removed. Otherwise, the pump or backup heater (optional) may be damaged.
☐	**Error code "E2" is displayed on the wired controller:** - Check the wiring between the wired controller and the unit.
☐	**Initial start-up at low outdoor ambient temperature:** To start the initial start-up in low outdoor ambient temperature, the water has to be heated gradually. Please use the preheating for floor function. (Refer to "SPECIAL FUNCTION" in FOR SERVICEMAN mode) **NOTE** For underfloor heating application, floor could be damaged if the temperature rises sharply in a short time. Please ask the building construction contractor for further information.

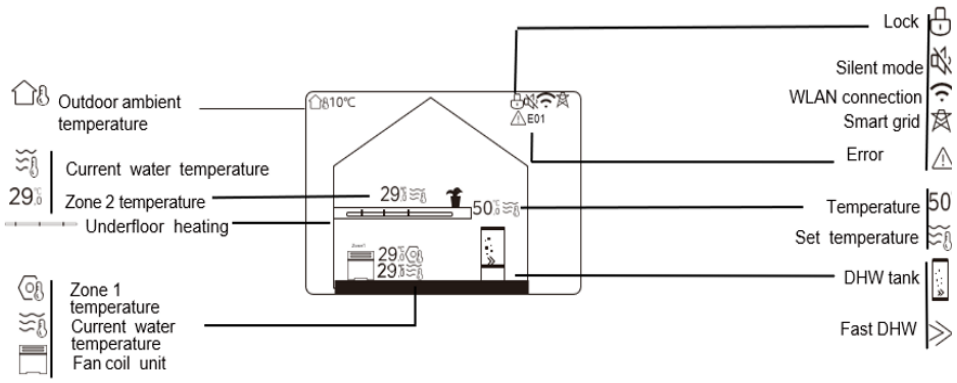
Overview of controller

In the middle of the PCB inside the electrical box, there is a LED display on startup this will display 0, this will also display any error codes that the system may have in the event of a fault. Once the unit starts to run this display will show the compressor frequency.

The controller will power up and will need the language setting. Again, any errors will be display on the controller.







Overview of controller

Setting the clock and date, using the cursors

- Go to Settings
- Display settings
- Time, Set the time.
- Date, set the date.
- Press the menu button to go back to the main screen.

Starting the unit in heating mode. Below is only if you are using the Midea controller as a room stat.

Use the Left and Right cursors the move between heating and the hot water cylinder.
Highlight the radiator over on the left, and press the power button, the radiator will go an Orange colour. This means the heating is activated.

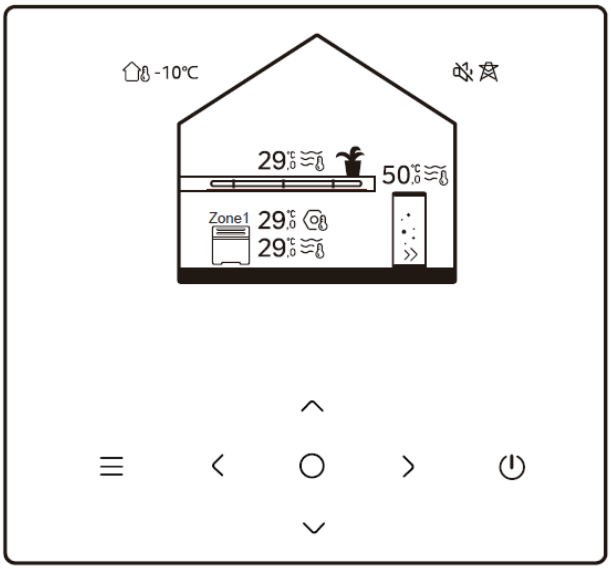
If you are using a third-party room stat, then this will control the heating On/Off.
The heat pump controller will display a message to tell you its unable to be used for heating because of the third-party controls. The Midea controller can be used for the flow temperature settings, these can be adjusted up/down.

Starting the unit in DHW to heat the cylinder
Use the cursors to scroll Right to the hot water cylinder, then press the power button to highlight the cylinder, use the up and down cursors to set the desired temperature you want the cylinder to heat too.

How to set up Smart controls (Smart Home App)

- Download the Smart Home App on to a device.
- Register.
- Once registered, then open the App, and go to the controller.
- Press the menu button and go to settings.
- Scroll down to WLAN Settings.
- Go to smart link and press the centre circle on the controller this will active the Wi-Fi connection.
- Once this is complete your Smart Home App will connect to your Unit.

Commissioning Settings



Press this combine button hold for 3 seconds

The password is 234

DO NOT SKIP THIS SECTION.

- For Servicemen hold the menu and the right cursor together until you get 000 (Enter Code 234)
- Go to DHW setting press the middle circle
- Disinfect to 1 if you would like the HP to do this function or 0 if you want an immersion heater to do this function.
- DHW Priority needs to be set to 1
- DHW Pump-D (Destrat pump if you have one then this would be set to 1) If you don't require this function set to 0
- DHW Priority time set, Depends on cylinder size. (Set appropriately)

- **COOLING MODE SET TO (0) OFF**

- Heating Mode set to 1
- Go to Zone 1 H-Emission set to 1 for radiators and 2 for underfloor heating, repeat for zone 2 if required.
- Temp. type setting please see the table below.

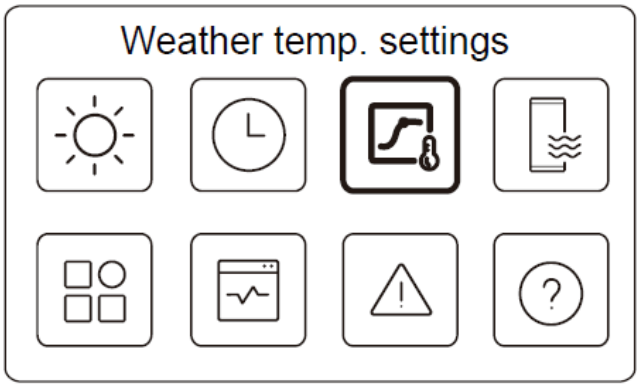
For single zone control

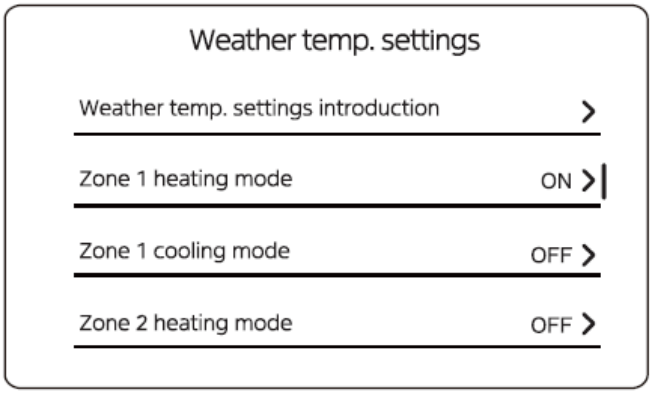
WATER FLOW TEMP.	ROOM TEMP.	DOUBLE ZONE	Zones control
1	0	0	Zone 1: Water temperature control
0	1	0	Zone 1: Room temperature control

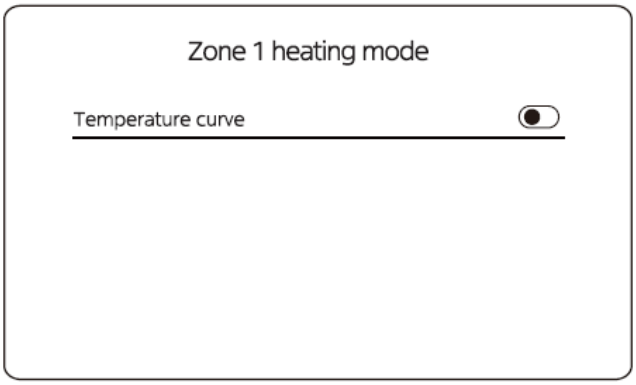
Commissioning Settings

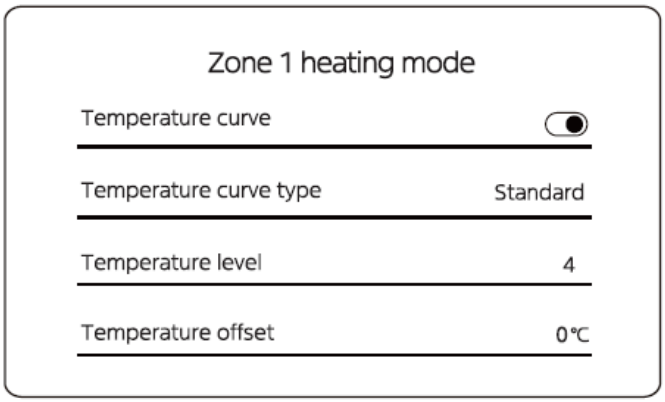
Room Thermostat setting. Room thermostat to 2 for single zone, please see table below.

- One Zone
- Room thermostat provides switch signal to control heat pump ON/OFF
- One zone control
- All timers are invalid except DHW timers
- Define water temperature
- Define mode (heating/cooling mode)





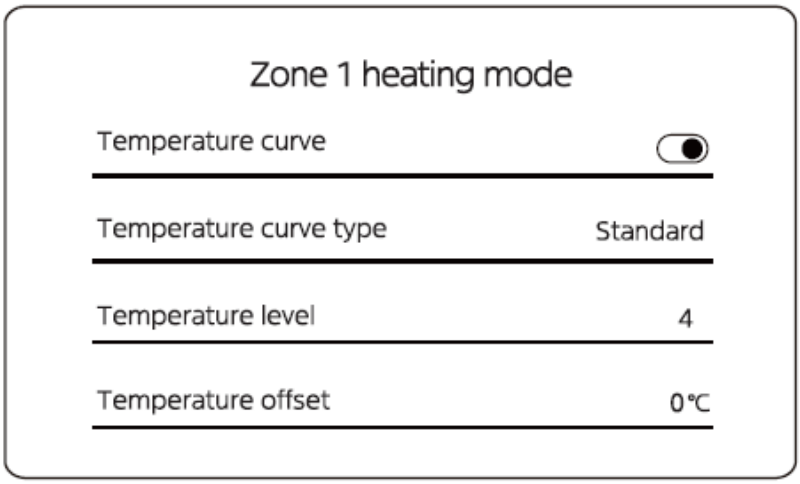


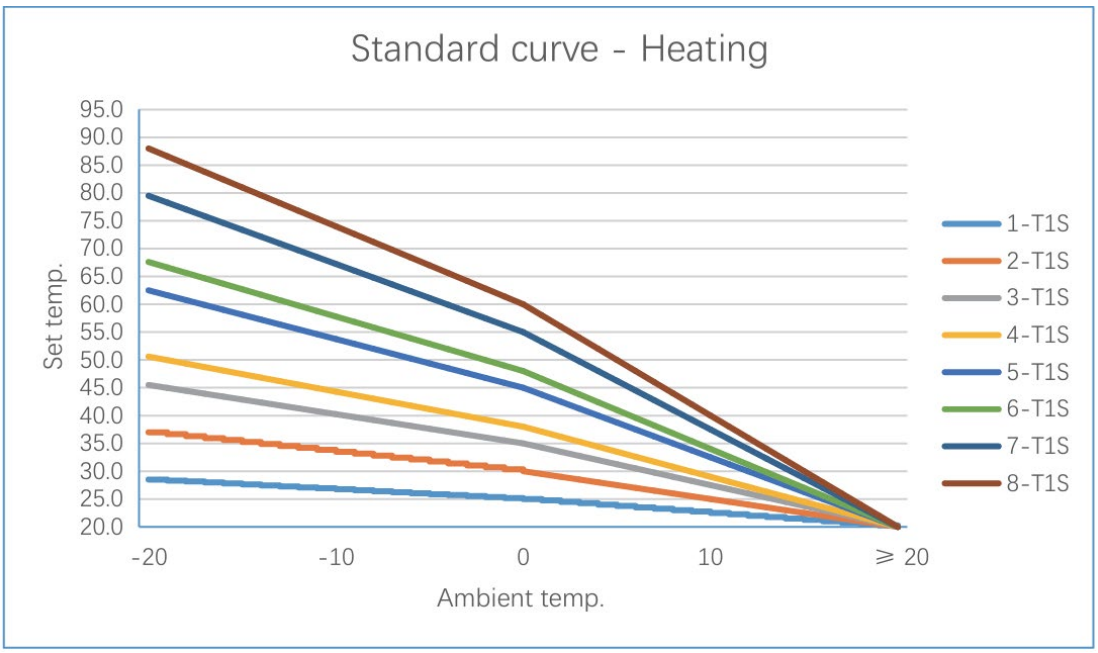


Commissioning Settings

Temperature curve type has 3 choices according to user's demand.

1. Standard, 8 curves can be selected
2. ECO, 8 ECO curves can be selected, ECO is available for Zone 1 heating mode only.
3. Customer, the curve can be defined by set parameter.

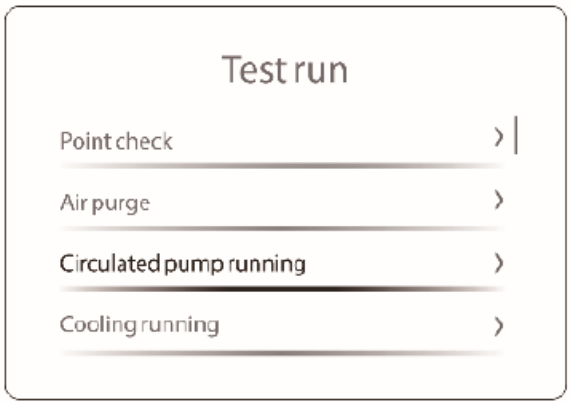




It makes the overall set water temperature of the curve increase or decrease.

Test Run

The **POINT CHECK** menu is used to check the operation of individual components. Select the components you want to check and toggle the on/off state of the component. For example ,if a valve does not turn on/off or a pump/heater does not operate when its on/off state is toggled, please check the connection between component and main PCB and make sure components' status is normal.

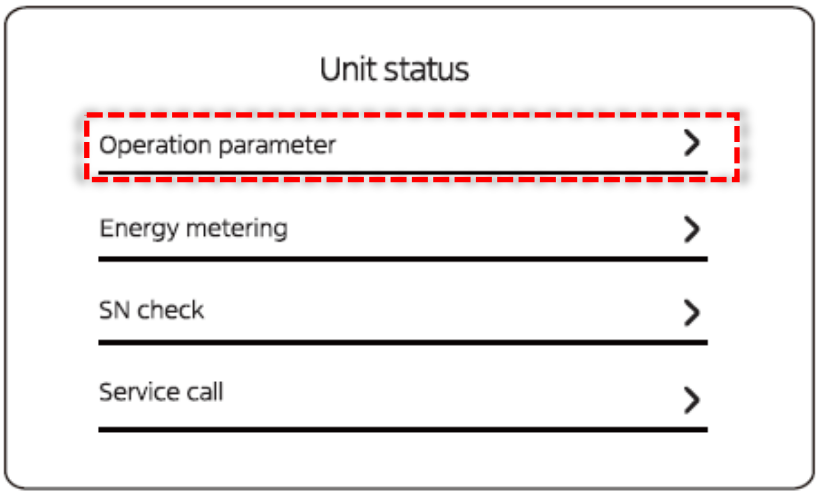


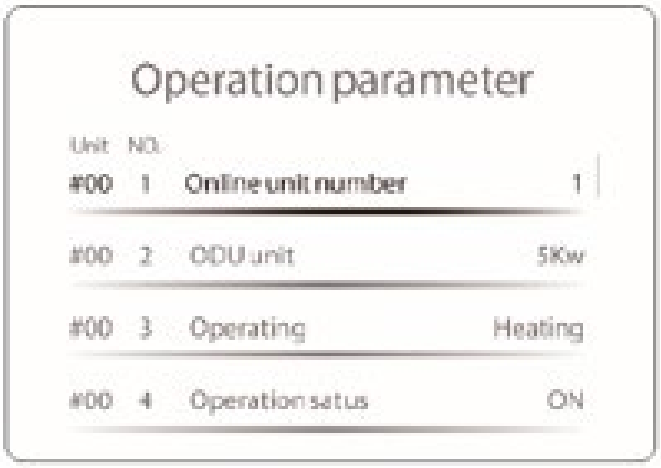
Factory Reset

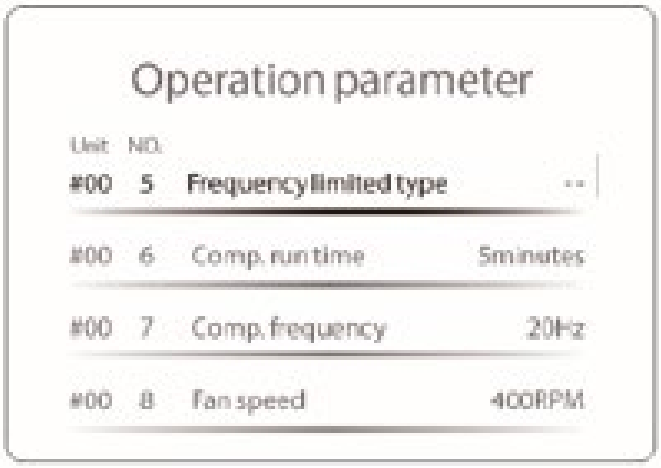
In the menu of serviceman go to Restore Factory settings press the centre button and select YES.

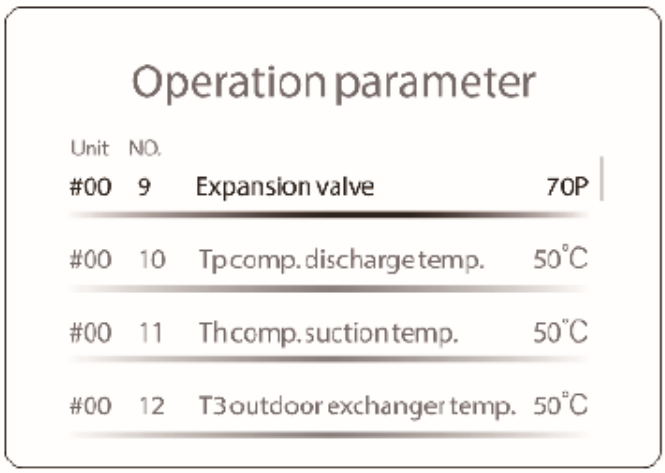
To come out of serviceman press the menu button and select YES.

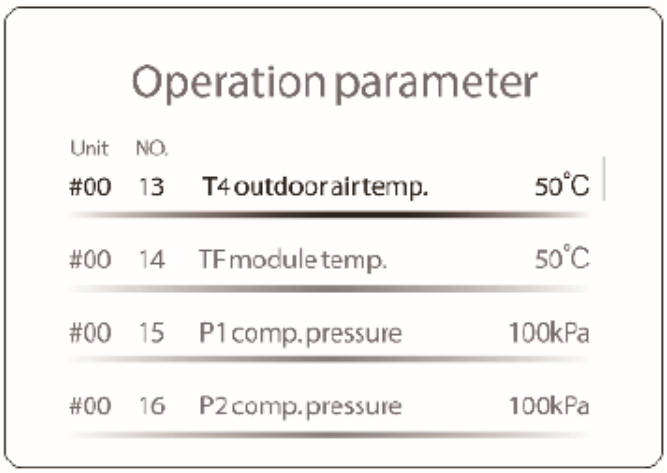
Operational Data











Operational Data

Operation parameter

Unit	NO.		
#00	17	T2B plate F-in temp.	50℃
#00	18	T2 plate F-out temp.	50℃
#00	19	Tw_in plate water inlet temp.	50℃
#00	20	Tw_out plate water outlet temp.	50℃

Operation parameter

Unit	NO.		
#00	21	T1 leaving water temp.	50℃
#00	22	Tw2 circuit2 water temp.	50℃
#00	23	Ta room temp.	50℃
#00	24	RH room humidity	50℃

Operation parameter

Unit	NO.		
#00	25	T5 water tank temp.	50℃
#00	26	T5_2 water tank temp.	50℃
#00	27	TBt buffer tank temp.	50℃
#00	28	Tsolar	50%

Operation parameter

Unit	NO.		
#00	29	T1S_C1 CLI. curve temp.	50℃
#00	30	T1S2_C2 CLI. curve temp.	50℃
#00	31	Water pressure	1bar
#00	32	Water flow	1m /h

Operation parameter

Unit	NO.		
#00	33	Heat pump capacity	10kW
#00	34	ODU current	1A
#00	35	ODU voltage	220V
#00	36	DC voltage	110V

Operation parameter

Unit	NO.		
#00	37	DC current	5A
#00	38	Power consump.	10kWh
#00	39	SV1	OFF
#00	40	SV2	OFF

Operational Data

Operation parameter

Unit	NO.		
#00	41	SV3	OFF
#00	42	Pump_I	OFF
#00	43	Pump_O	OFF
#00	44	Pump_C	OFF

Operation parameter

Unit	NO.		
#00	45	Pump_S	OFF
#00	46	Pump_D	OFF
#00	47	IBH1	OFF
#00	48	IBH2	OFF

Operation parameter

Unit	NO.		
#00	49	TBH	OFF
#00	50	AHS	OFF
#00	51	Comp.total run time	100h
#00	52	Fan total run time	100h

Operation parameter

Unit	NO.		
#00	53	Pump_I total run time	100h
#00	54	IBH total run time	100h
#00	55	IBH2 total run time	100h
#00	56	TBH total run time	100h

Operation parameter

Unit	NO.		
#00	57	AHS total run time	100h
#00	58	IDU software	01-01-2023V01
#00	59	ODU software	01-01-2023V01
#00	60	HMI software	01-01-2023V01

Operation parameter

Unit	NO.		
#00	61	Pump_IPWM	70%

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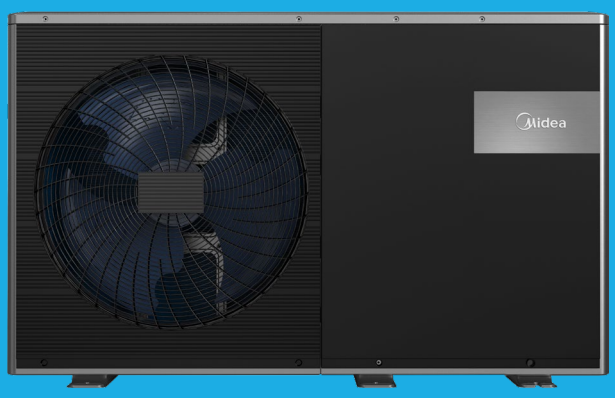

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