

inverECO PLUS

Installation and Operation Manual



CONGRATULATIONS AND THANK YOU FOR CHOOSING THE MADIMACK HIGH EFFICIENCY INVERTER POOL HEAT PUMP.

THIS MANUAL CONTAINS IMPORTANT INFORMATION THAT WILL HELP YOU IN OPERATING AND MAINTAINING THIS PRODUCT.



Please read and fully understand all information provided before attempting to install the pool heat pump.



All our heat pumps are built and designed to the highest standard and are protected by our extended warranty service for peace of mind.

Warranty registration is required to be submitted online in conjunction with the commissioning page and warranty registration page in the Appendix section at the back of the booklet www.madimack.com.au/warranty-registration.

For technical questions and further information please contact support@madimack.com.

We hope you enjoy using our heat pumps.

Thank you!

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IMPORTANT INFORMATION

These instructions are an essential part of the product and must be shared with the installer and kept by the end user. It's very important to read and understand all the warnings and guidelines in this manual as they provide crucial information for safely handling and operating the product. Always keep this manual accessible for future reference.

Follow Local Regulations: Installation must follow local regulations and the manufacturer's instructions. This work must be done by a qualified professional. A "qualified professional" is someone with the right skills, knowledge, education, training, and experience to safely and competently handle this equipment.

Safety Warning: Incorrect installation can cause injury to people or animals, and damage to the equipment. The manufacturer is not responsible for any damage caused by incorrect installation.

Inspection: When you unpack the heat pump, inspect it carefully for any damage. Before connecting the heat pump, the installer must ensure that the installation conditions match the specifications provided by Madimack and that they do not exceed the allowed installation limits for this product.

Electrical Safety: Always disconnect the power supply before starting any installation, maintenance, or repair work on the heat pump. If the heat pump malfunctions or has an operational error, disconnect the power supply immediately and do not try to fix it yourself. Only authorized technical service personnel should perform repairs using original spare parts. Not following these instructions can compromise the safety of the heat pump and may void the warranty.

Routine Maintenance: Follow Madimack's maintenance instructions to ensure the heat pump works efficiently and properly. If you sell or transfer the heat pump to someone else, make sure to include all technical documentation and the original invoice.

Proper Use: This heat pump is designed only for heating swimming pools. Using it for any other purpose is inappropriate and can be dangerous.

Liability Disclaimer: Madimack is not responsible for any damage caused by improper installation, operation errors, or failure to follow the provided instructions and installation standards.

COVER THE BASICS:

1. Check that you have received the package in good condition
2. Every residential heat pump comes with two accessory boxes and the manual. The manual will mention all the parts and where they belong to make sure that the unit is commissioned, as per the 'commissioning' section, and that adequate water flow rate is provided.
3. Keep the surroundings of the unit clear of any debris, tree branches, and anything that can affect the ventilation of the unit. Do not install in any type of enclosed location. This includes sheds, decking, boxes with ventilation as the air needs to be mechanically removed.
4. Keep the invoice/packing slip in a safe place for future reference.
5. Register the unit for warranty as per the warranty section in this manual
6. Ensure that the unit is installed in an outdoor area, if it has to be indoors the unit will need to be ducted to the outside and completed by a competent person with ventilation and air flow knowledge.
7. Ensure the condensate drain is attached, has a gradual fall and is accessible as this will need regular check-ups for any blockages or debris build ups. For runs longer than 2 meters a larger diameter drainpipe will be required (not included) For water sensitive areas a condensation drip tray may be required (not included)
8. For Wi-Fi control make sure that you have full Wi-Fi strength in the heat pump area, more than -50 DB is recommended for strong connection.
9. Make sure that the unit is installed as per the ventilation diagrams to ensure efficient heating rates
10. Ensure position of heater is located for ease of accessibility, maintenance and servicing

SAFETY PRECAUTIONS

- We have provided important safety messages in this manual for the installation, maintenance and repair of your heater.
- Please read thoroughly and obey all safety messages.
- Environmentally friendly R32 Refrigerant is used in this heat pump.

Warning



This WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury or injury to a third party. These signs are rare but are extremely important.



a. Keep the heat pump away from fire source.



c. Repair and disposal must be carried out by trained service personnel.



b. Unit must be placed in a well-ventilated area; indoor or enclosed areas are not allowed.



d. Carried out by professional trained personnel.

Attention

- Please read the following instructions before installation, use and maintenance.
- Installation must be completed only by competent persons only, and in accordance with this manual and local regulations.
- Check all water connections are sealed and tested before operating the machine.
- Except for the methods recommended by the manufacturer, do not use any methods to accelerate the defrosting process or clean the frosted parts.
- If a repair is required, please contact the nearest after-sales service center. The repair process must be strictly in accordance with this manual. Repairs made by unauthorized persons may void the warranty.
- Correctly set temperature required for personal preference making sure to avoid overheating or overcooling.
- Please do use or stack substances or other materials which may block the air flows to the inlet or outlet areas. This causes the efficiency of the heater to be reduced and may damage the machine.
- Do not use or stock combustible gas or liquids such as thinners, paint and fuel, to avoid fire!
- In order to optimize the heating effect, please install heat preservation insulation on pipes between the swimming pool and the heater, and please use a recommended cover on the swimming pool.
- Connecting pipes of the swimming pool and the heater should be less than 10 metres where possible.
- Before using or working on the unit, always check that the voltage indicated on the name plate corresponds to the power supply available. Please see below for an example name plate (Image 1)
- Ensure that the heater is maintained and serviced at regular intervals
- Please make sure an earth leakage circuit breaker is installed in the circuit.
- Before use, please make sure the plug is well protected from water.

Inverter Pool Heat Pump

Model No.: Elite V4-100

SKU No.: HPESV4AU100

Condition: Air 27°C/ Water 27°C/ Humidity 80%	
Heating capacity (kW) Max/ Energy efficiency mode	11.0/8.8
COP	16.2~7.3
COP at 50% speed	11.4
Condition: Air 15°C/ Water 26°C/ Humidity 70%	
Heating capacity (kW) Max/ Energy efficiency mode	7.3/5.8
COP	7.5~5.0
Cooling capacity (kW)	4.1
Rated input power (kW)	0.21~1.55
Input power at 50% speed	0.44
Rated input current (A)	0.91~6.74
Max input current (A)	9.0
Power supply	230V/ 1Ph
Advised water flow (L/min)	65
Protection level	IPX4
Weight (kg)	66
Refrigerant R32 (g)	550
GWP value	675
CO2 equivalent (tonnes)	0.371
Contains fluorinated greenhouse gases.	
 Caution, risk of fire 	

Note: Image above is for reference only.

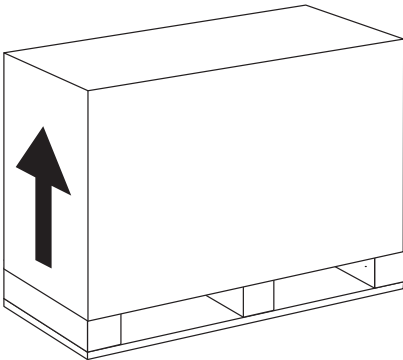
Safety

- Please keep the main power supply switch out of reach from the children.
- Ensure product installation and location is to local and national standards
- If power is suddenly disconnected during operation, and later the power is restored, the heater will start up automatically.
- Please switch off the main power supply in high storm weather to prevent the machine from damage that could be caused by lightning strikes.
- Any repairs should be carried out in a well-ventilated area. Any source of ignition is prohibited during the inspection.
- Safety inspection must be carried before the maintenance or repair for heat pumps with R32 gas in order to minimize the risk.
- If R32 gas leaks during the installation process, all operations must be stopped immediately and call your local service center.

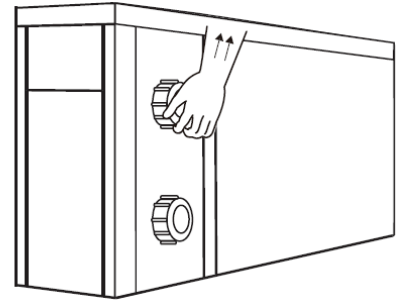
ABOUT YOUR HEAT PUMP

2.1. Transportation

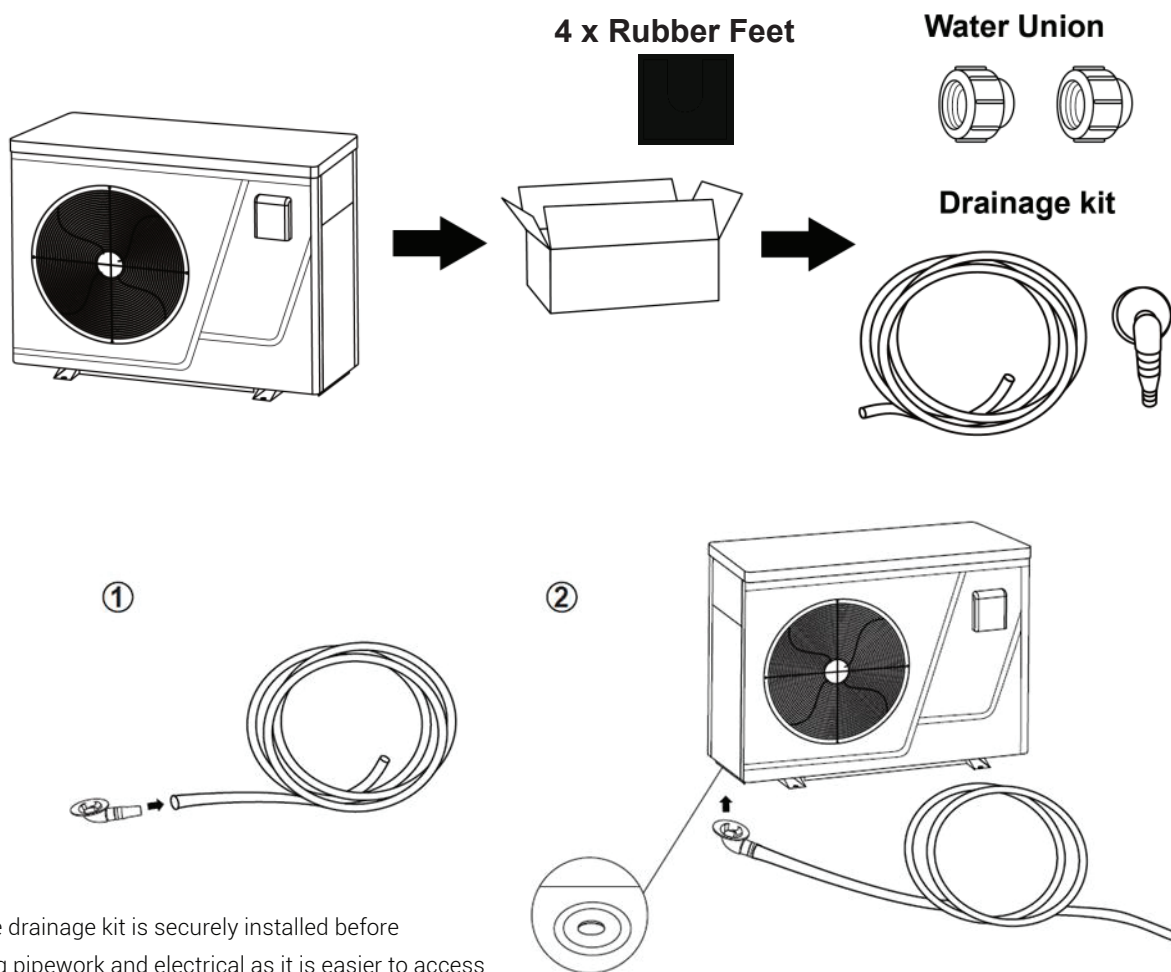
a. Always keep upright



b. Do not lift the water union (Otherwise, the titanium heat exchanger may be damaged)



2.2 Accessories



Ensure the drainage kit is securely installed before connecting pipework and electrical as it is easier to access

2.3 Features

- a. DC Twin-rotary inverter compressor of Mitsubishi
- b. DC Brushless fan motor
- c. EEV Technology
- d. Reverse cycle defrosting with 4-way valve
- e. High-efficiency twisted titanium heat exchanger
- f. Sensitive and accurate temp control and water temp display
- g. High pressure and low-pressure protection

2.4 Operating range

To provide you comfort and pleasure, please set swimming pool water temperature efficiently and economically.

- The heat pump can work between air 0°C ~ 43°C,
- Temperature of heating 18°C ~ 40°C
- Temperature of cooling 12°C ~ 30°C

Ideal operation range is between air 15°C ~ 25°C

2.5 Introduction of different modes

Mode	Modes	Strength
	Boost mode	Heating capacity: 20% ~ 100% capacity Intelligent optimization Fast heating
	Silent mode	Heating capacity: 20% ~ 80% capacity Sound level: 3dB (A) lower than Boost mode

2.6 Technical parameter

Model	Eco Plus 9kW	Eco Plus 13kW	Eco Plus 16kW	Eco Plus 20kW	Eco Plus 23kW	Eco Plus 28kW
PERFORMANCE CONDITION: Air 27°C / Water 27°C / Humid. 80%						
Heating Capacity (kW)	9	13	16	20.2	24.2	28
COP Range	10.5~6.2	10.8~6.3	10.7~6.2	10.8~6.2	10.8~6.3	11.0~6.3
PERFORMANCE CONDITION: Air 15°C / Water 26°C / Humid. 70%						
Heating Capacity (kW)	9	13	16	20.2	24.2	28
COP Range	10.5~6.2	10.8~6.3	10.7~6.2	10.8~6.2	10.8~6.3	11.0~6.3
PERFORMANCE CONDITION: Air 35°C / Water 28°C / Humid. 80%						
Cooling Capacity (kW)	3.6	5	6.1	7.7	8.8	10.8
TECHNICAL SPECIFICATIONS						
Advised pool volume (m³)*	20~45	35~65	40~75	50~90	60~110	65~120
Operating Air Temperature (°C)	0 ~ 43°C					
Temperature set point range (°C)	12 ~ 40°C					
Heat exchanger	Twisted Titanium Heat Exchanger					
Compressor	Full Stepless DC Compressor					
Power supply	230V 1Ph					
Rated input power (kW)	0.28 ~ 1.55	0.41 ~ 2.01	0.50 ~ 2.56	0.60 ~ 3.26	0.72 ~ 3.81	0.89 ~ 4.43
Input power at 50% Speed (kW)	0.53	0.75	0.9	1.15	1.29	1.58
Sound level at 1m dB(A)	41.6~53.5	43.9~54.0	46.2~57.3	46.3~58.1	46.9~58.7	48.6~60.5
Sound level by 50% speed 1m dB(A)	46.8	49.5	49.7	50.6	51.1	52.8
Sound level at 10m dB(A)	21.6 ~ 33.5	23.9 ~ 34	26.2 ~ 37.3	26.3 ~ 38.1	26.9 ~ 38.7	28.6 ~ 40.5
Advised water flow (m³/h)	3~5	4~6	6~8	7~10	10~12	10~12
Water connection (mm)	40mm					
Net dimension LxWxH (mm)	864*359*648	864*359*648	954*359*648	954*359*748	954*429*748	1122*415*958
Net Weight (kg)	46	49	60	68	68	90
Maximum input current (A)	8	10	17	19.2	20	23.5
Power cord (mm²)	3 x 1.5	3 x 1.5	3 x 4	3 x 4	3 x 4	3 x 4
Gross Weight (kg)	52	55	67	76	78	107
Packaging dimension LxWxH (mm)	950*375*675	950*375*675	1040*375*675	1040*375*775	1040*435*770	1130*430*1000

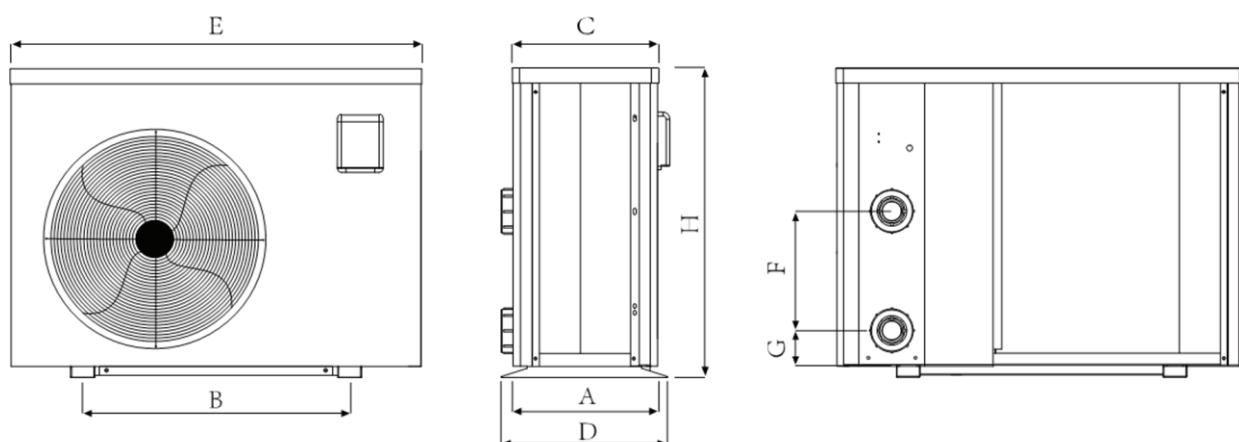
Remarks:

This heat pump is able to perform normal within air temp 0°C ~ 43°C, efficiency will not be guaranteed out of this range. Please take into consideration that the pool heat pump performance and parameters are different under various conditions.

Related parameters are subject to adjustment periodically for technical improvement without further notice. For the most up to date details, please refer to nameplate on the heat pump.

* Advised pool volume applies to a private pool with isothermal cover, from April to September.

2.7 External dimensions

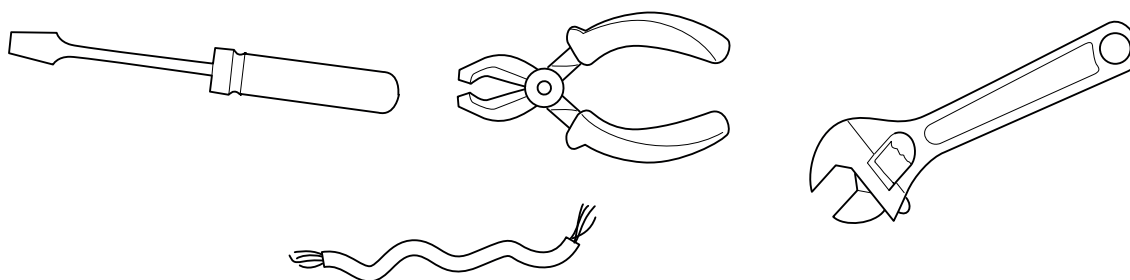


	A	B	C	D	E	F	G	H
Eco Plus 9kW	334	560	318	359	864	250	74	648
Eco Plus 13kW	334	560	318	359	864	290	74	648
Eco Plus 16kW	334	590	318	359	954	350	74	648
Eco Plus 20kW	334	590	318	359	954	390	74	748
Eco Plus 23kW	404	590	388	429	954	460	74	748
Eco Plus 28kW	404	720	388	429	1084	640	74	948

- Above data is subject to modification without notice.

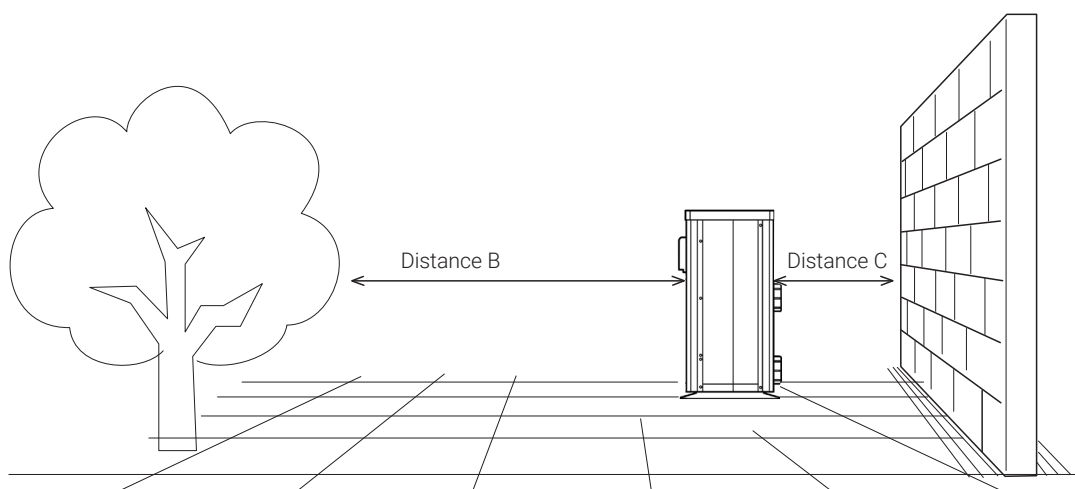
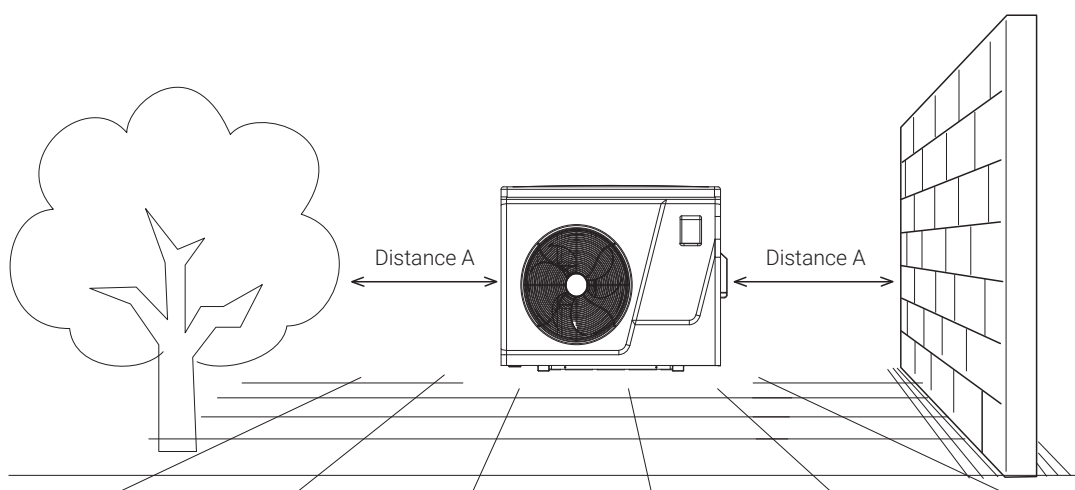
Note: Above swimming pool heat pump specification drawing is for installation reference only to technical staff.

3.1 Tools Required for Installation



3.2 Installation Site

- The unit must be installed outdoors
- A free space must be left around the unit (See dimensions regarding your specific unit in the following section section) to allow for maximum recycling of air and peak performance.



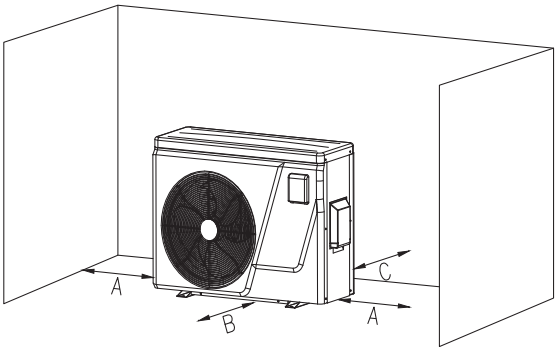
Distances used are an example for preparing your heat pump installation site. Parameters are specific to each Madimack heat pump. Please use the specific parameters to your heat pump given in the following section to map out the heat pump installation site.

1st case: Single unit – 3 obstacles

Please note that these are absolute minimum distances and where possible should always have a greater difference. Under no circumstances should any of the distances be reduced as performance will be affected. More ventilation is better.

The diagrams assume that it's a completely clear above the unit.

These units must be installed outdoors in a well-ventilated area, its recommended not to be installed in decks, under houses, in sheds, or any sorts of indoor locations.



1.5m clearance above
Not following these requirements may void warranty

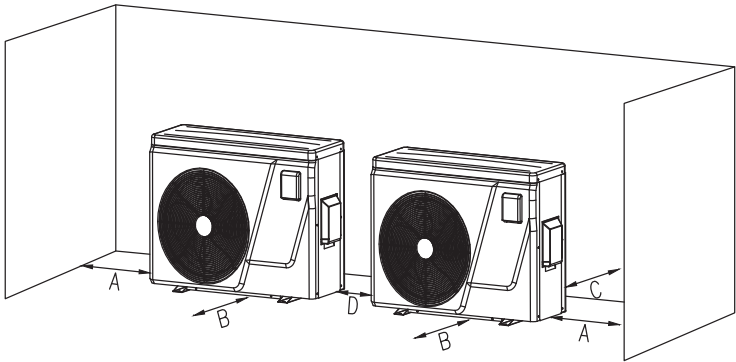
Model	Eco Plus 9kW	Eco Plus 13kW	Eco Plus 16kW	Eco Plus 20kW	Eco Plus 23kW	Eco Plus 28kW
Distance A (mm)	300	300	300	300	300	300
Distance B (mm)	750	750	1000	1000	1000	1000
Distance C (mm)	300	300	300	300	300	300

2nd case: Multiple units – 3 obstacles

Please note that these are absolute minimum distances and where possible should always have a greater difference. Under no circumstances should any of the distances be reduced as performance will be affected. More ventilation is better.

The diagrams assume that it's a completely clear above the unit.

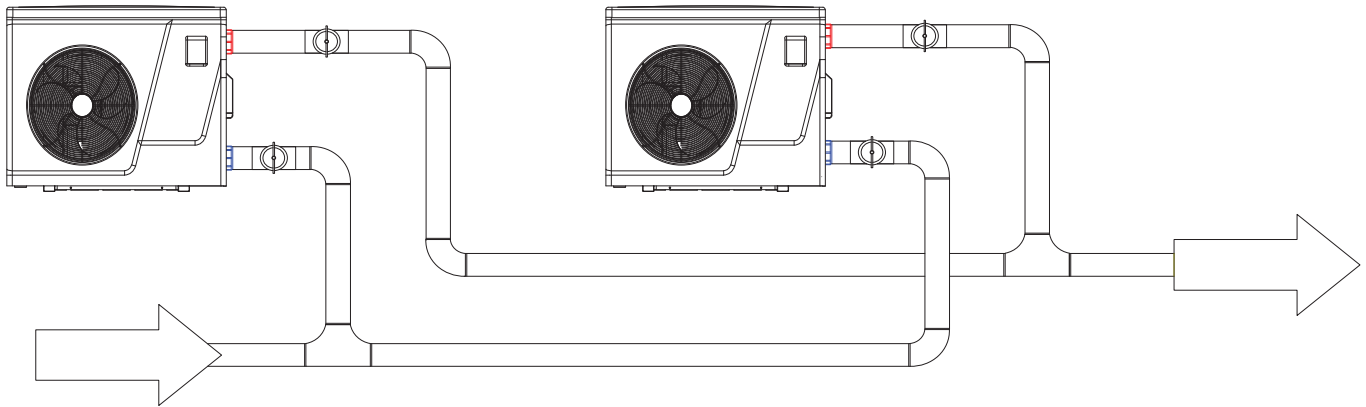
These units must be installed outdoors in a well-ventilated area, its recommended not to be installed in decks, under houses, in sheds, or any sorts of indoor locations.



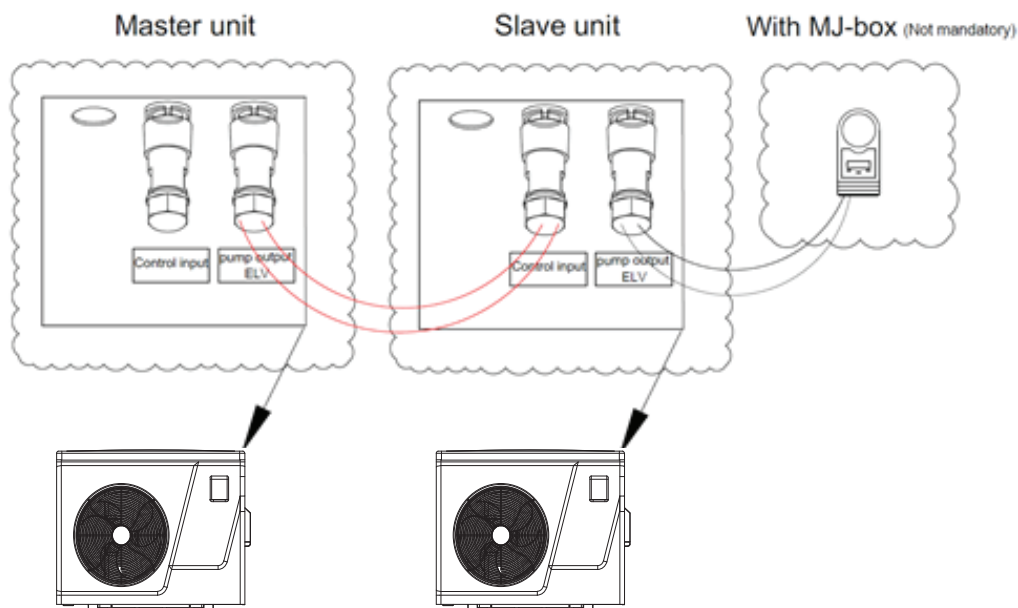
Model	Eco Plus 9kW	Eco Plus 13kW	Eco Plus 16kW	Eco Plus 20kW	Eco Plus 23kW	Eco Plus 28kW
Distance A (mm)	300	300	300	300	300	300
Distance B (mm)	750	750	1000	1000	1000	1000
Distance C (mm)	300	300	300	300	300	300
Distance D (mm)	600	600	600	600	600	600

Plumbing Multiple units:

Multiple heat pumps acting as one system should be connected in Cascade (Parallel Connection). Adequate flow rate should be provided to all the units in the system to ensure efficient heating (Please refer to the commissioning section in the manual to learn about heat pumps commissioning). The diagram below represents the cascade connection



Wiring Multiple Heat Pumps Together (Master and slave connection):



Wiring multiple heat pumps together can be achieved through a master and slave connection

- 1- The first unit to get the water flow is considered the "Master" and the second unit as the "Slave"
- 2- Each unit will have its own power supply.
- 3- Connect the pump output socket on the "Master" unit to the Control input socket on the "Slave" unit
(See control socket connection diagram, section [depending on the designer])
- 4- Set your desired swimming temperature on the "Master" unit.
- 5- Set the "Slave" temperature to 40 degrees (must be higher than the set temperature on the master unit)
- 6- Master unit will now initiate the Slave unit either by switching on the heat pump manually from the controller on the front panel or through the timers set on the heat pump app (Must have strong Wi-Fi signal, if not a Wi-Fi booster is extended to cover the heat pump area)
- 7- Note: This setup can be neglected if the units are plumbed in Parallel and there is no external controller of any sorts is needed, in case there is an external controller or the plumbing was done in series then this wiring setup is mandatory.
- 8- In case of an MJ-Box is required, the fig 8 cable from the MJ-box connects to the pump output of the "Slave" unit.

Installation reminder

Only competent persons are authorized to install the heat pump and should be educated with the relevant building codes and standards of their current state or local governing body for all electrical, mechanical and water services to prevent danger or damage to the unit.

a. Location and clearances



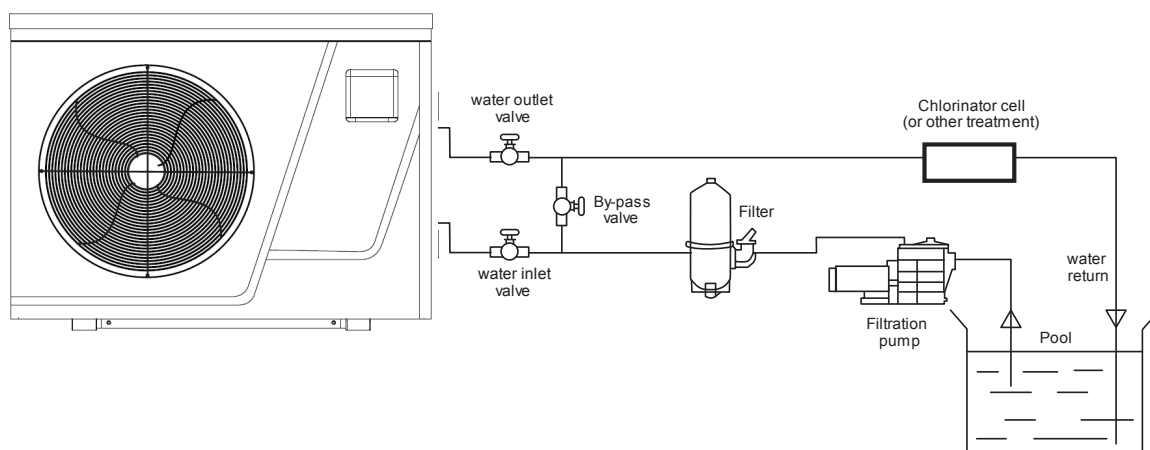
The inverter pool heat pump should be installed in a well-ventilated area.

b. Typical installation diagram

Installations can differ dependent on-site conditions below is only a representation of one possibility.

Note: the inlet and outlet positions for the pipework is a representation only and can be positioned differently.

Please see section: Installation options for more information of accessories available and different plumbing layouts



Placing the unit and water connections

- 1) The heater should be placed on rubber feet (included)
- 2) The frame should be fixed by bolts (M10) to concrete foundation or brackets. The foundation must be solid and fastened and/or the bracket must be strong enough and antirust treated.
- 3) Do not stack substances that will block air flow near inlet or outlet area, and there is no barrier within 50 cm behind the machine, or it will affect the efficiency of the heat pump and even stop the machine.
- 4) The machine needs an appended pump (Supplied by the user).
The recommended pump specification water flow: refer to Technical Parameter, Max lift $\geq 10\text{m}$.
- 5) When the machine is running, there will be condensation water discharged from the bottom, please pay attention to it. Please hold the drainage nozzle (accessory) into the hole and clip it well, and then connect a pipe to drain the condensation water out.
- 6) It is highly recommended not to install indoor or in suffocated areas (this included doors and walls with slats. for indoor installation mechanical ventilation and specialised equipment must be installed. Please consult with your local service center for indoor installation requirements.

Water pipe connection



The inlet and outlet water unions can't stand the weight of soft pipes.

The heat pump must be connected by hard pipes and the pipes should be supported by brackets to reduce downward weight on the water connections

Unit inlet and outlet water pipe connections are 40 mm

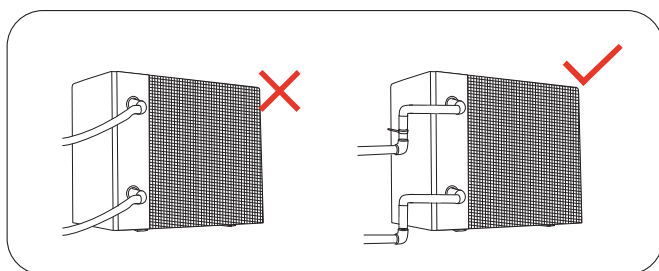
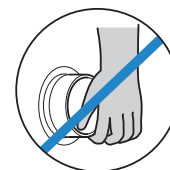
- PVC pipe is recommended to use for these water connections
- A reducer can be connected to the 40 mm connection to connect the heat pump to a system with piping larger than 40 mm
- Do not connect your heat pump to a pool system with pipes of a size less than 40 mm. This will affect the flow rate, the heating speed and the overall performance of the heat pump.
- Below is inlet and outlet symbols



Water outlet



Water inlet



References for protecting devices and cable specification

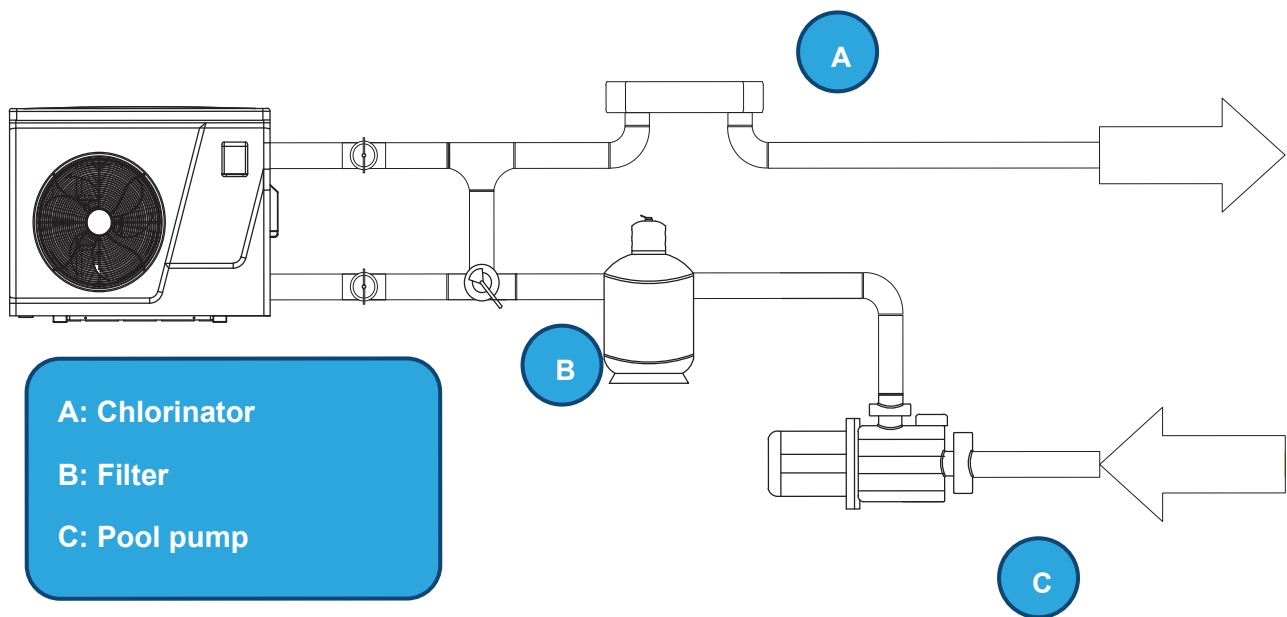
Note: Above data is adapted to power cord < 10m. If power cord is 10m ~ 40m, the wire diameter must be increased. The signal cable can be extended to 50m maximum .

Please see appendix for further wiring information including pump control and auxiliary input

Installation options:

o Flow switch activated heating

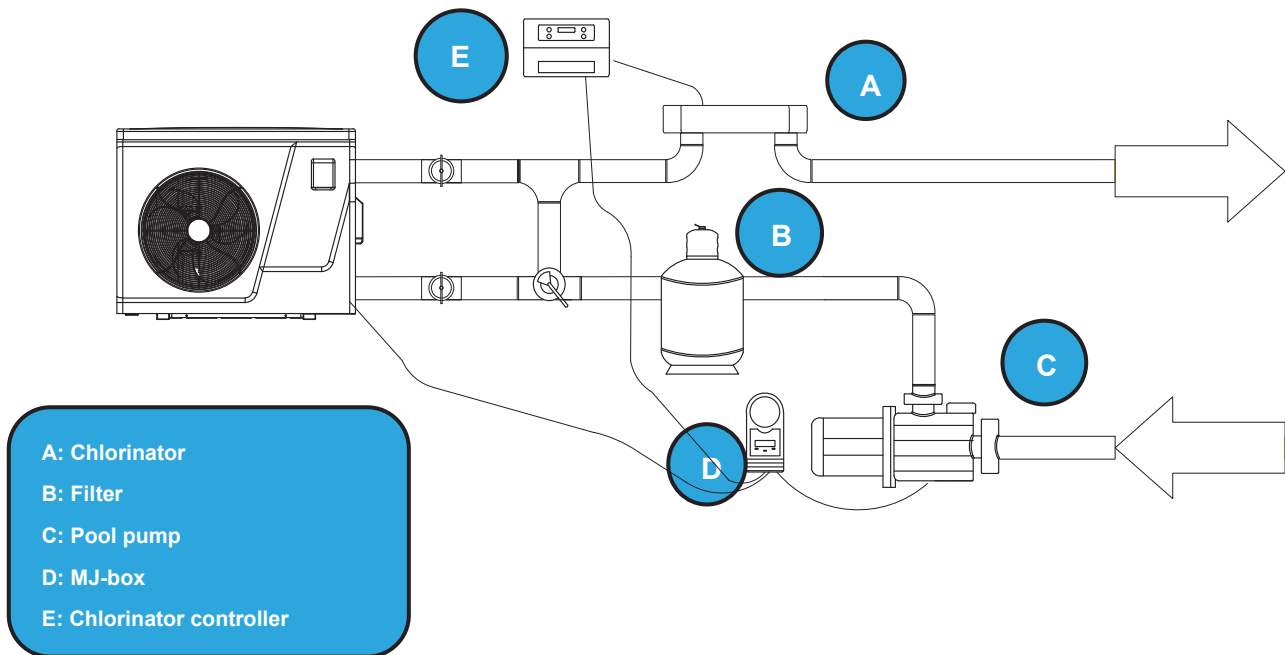
The heat pump is activated by the flow of water initiated from the filtration/circulation pump, if the heater gets to temperature within the timers the unit will first start to use the inverter technology to slow the machine down to maintain the temperature and eventually to a stop.



1. Chlorinator controller initiates the filtration pump either manually or through a timer.
2. Heat pump's flow switch senses the water flowing through the heat pump.
3. Heat pump starts and will run until temperature is reached or filtration pump switches off
4. No additional internal wiring to the heat pump is required in this set up
5. No additional settings needed to be changed.
6. If the circulation pump is not running and no flow is detected, the unit will display E3 – this is normal and an indication the unit is sitting idle waiting for the filtration pump to start again.
7. If the pool temperature is not reached within the filtration times you may need to extend the timers to match the heating requirement.

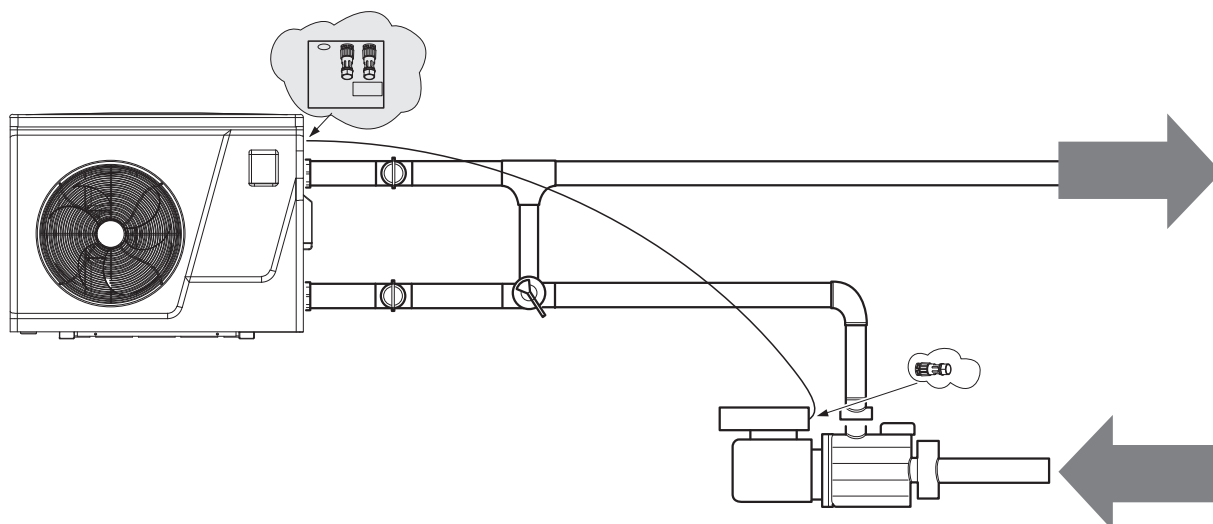
o Heat pump activation without using the chlorinator controller and using the one pump used for filtration (additional controller required)

An on-board pump output relay can activate the main filtration pump by using it in combination with a "single pump controller" without using the chlorinator timers needing to be activated which will stop over chlorination but still use a single supply pipework for the pool. This set-up is best when only single pipework is available from the pool and doesn't have individual heating pipework. Efficient with only one pump working.



1. Termination socket is labeled (Pump control output) found on the side of the heat pump and connects to P1 – P2 on the on-board relay and is activated by the timers (set on the Heat pump app) and pool temperature.
2. Once temperature is reached or the timer is finished the heat pump will switch off the relay output stopping the circulation pump.
3. If the pool reaches temperature but the timer is still active the heat pump will switch off relay to stop the circulation pump. Whilst the timer is still active every hour it will run the circulation pump for 2 minutes to test the water temperature. If the temperature is 1 degree below set point the heat pump will continue to run the circulation pump and start the heating process again.
4. Pump control socket only to be used with low voltage cable and devices
5. Heat Pump timers are set through the mobile application and requires a Wi-Fi connection. If no Wi-Fi is present, then additional external timer may be required or a Wi-Fi booster to extend a local Wi-Fi network (not supplied)
6. On the single pump controller (MJBOX), connect the black power cable to a 240V GPO, connect the grey piggyback cord into the chlorinator, and plug the water pump into the bottom of the single pump controller (MJBOX).
7. Connect the Fig 8 wire from the single pump controller to the pump control output terminals. (See control socket connection diagram, section [depending on the designer])

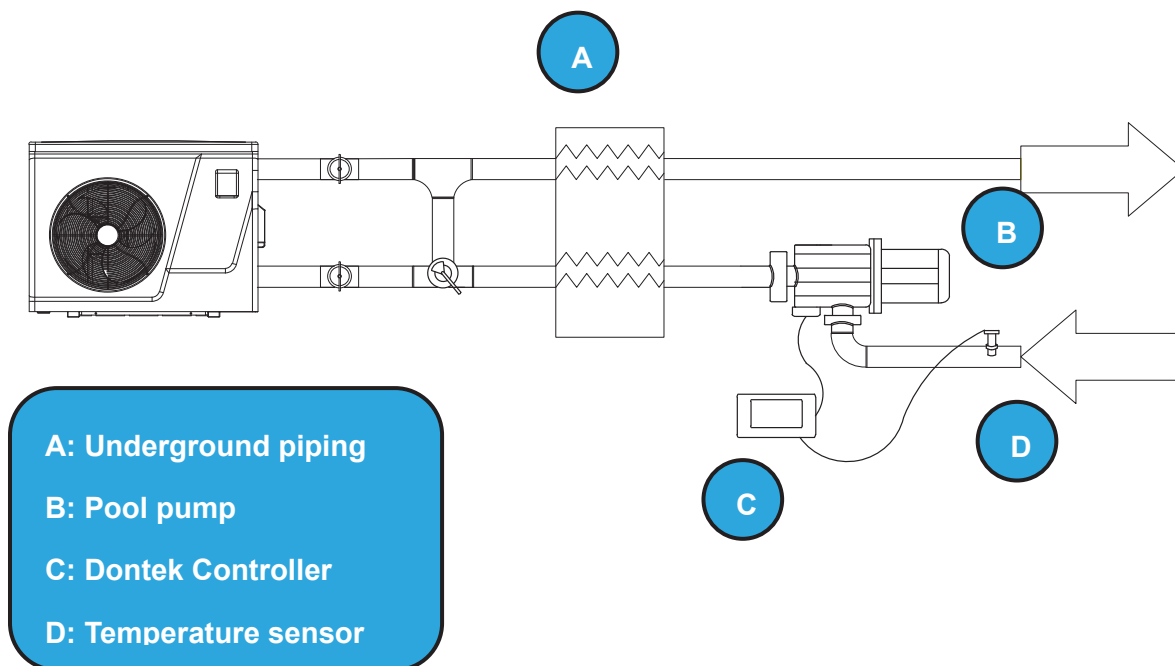
Individual circulation pump installation (Madimack heater + Madimack circulation pump)



- 1- See Pool Pump installation manual for more information on commissioning and how to set the pump. (pump should be in normally off state for activated control)
- 2- Termination socket is labeled (Pump control output) found on the side of the heat pump, connected to the quick connect socket that comes with the Inverflow pro and ultra pumps. InverFlow Eco pump cable sold separately (See control socket connection diagram, section [depending on the designer])
- 3- Once temperature is reached or the timer is finished the heat pump will switch off the relay output stopping the circulation pump.
- 4- If the pool reaches temperature but the timer is still active the heat pump will switch off the relay to stop the circulation pump. Whilst the timer is still active every hour it will run the circulation pump for 2 minutes to test the water temperature. If the temperature is 1 degree below set point the heat pump will continue to run the circulation pump and start the heating process again.
- 5- Heat Pump timers are set through the mobile application and require a Wi-Fi connection. If no Wi-Fi is present, then additional external timer may be required or a Wi-Fi booster to extend a local Wi-Fi network (sold separately)
- 6- Pool pump cannot be adjusted when controlled by heater and will be indicated by Di2 on the controller

o Solar retro

In some situations, when a heat pump is replacing a solar heating system, the pipework is available to be used next to the house but there is no way of adding a new electrical circuit to the pool equipment. With the use of an additional temperature sensor, you can use the in-built flow switch to activate the heating. Allowing you to use the existing solar pump and to install the heater closer to the switch board.



1. It may be impractical to get a new power cable from the house switch board to the pool equipment area due to finished flooring etc., in this case it may be possible to use the existing pipework which connects to the house and install a power cable from there.
 2. An external thermostat controller can initiate the existing circulation pump, thus running the heat pump through the flow switch for full temperature control.
- Please speak to your installer for more information.
3. No additional wiring to the heat pump is needed internally
 4. Timers are set on the external thermostatic controller
 5. Set heat pump to 40 degrees (above the set point temperature of the external temperature controller.)

o Automation systems and additional controls

The Madimack heat pump has an external controller input built into the heater. This is to allow for external connections such as automation systems, PV inverter controllers, or external timers.

The input is a volt free input and extra should be taken that the device connecting to is a volt free relay. For 230v inputs please see Madimack Automation Bridge (sold separately) for more information.

Connecting additional controls

230V auxiliary outputs, please see Madimack automation bridge (sold separately) www.madimack.com.au/brochures

The heat pump comes with easy to connect socket labeled as control input

The unit comes pre-wired with a bridge cable connected. To add an external control to activate the heat pump, remove the bridge and add in a volt free terminal connection. Please check with the automation system provider that the connection is volt free and the best way to install with their set-up.

Please see control socket connection diagram for further information around connecting to the socket.)

If the external controller is not initiating the heat pump to operate the display will show the word "OFF"

Madimack quick connect is a unique feature found in Madimack products aimed to simplify the installation process.

The sockets can be found on the right-hand side of the unit, used to simplify the process of connecting control cables from and into the heat pump (Volt free connections only).

If these are removed without being connected it may show EXT OFF on the display.



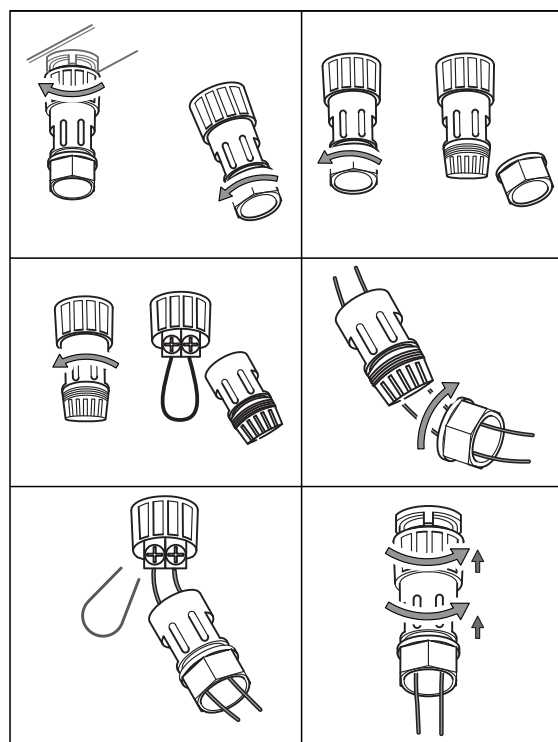
Control input (Slave connection input normally closed):

This is used to allow control over the heat pump from an external source, in this connection the heat pump is a slave of the external control signal and will only operate if it's getting the signal. This is a normally closed connection and has a loop wire inside. If you remove this socket the unit will not operate and will display EXT OFF on the controller.

To connect to external devices simply remove the looped wire and attach to the control output on the automation system. Please read and follow the instructions of the control Centre carefully. This is a volt free circuit

The control input socket can be used with the following:

- 1- External pool automation systems
- 2- A master heat pump in multiple heat pumps install.

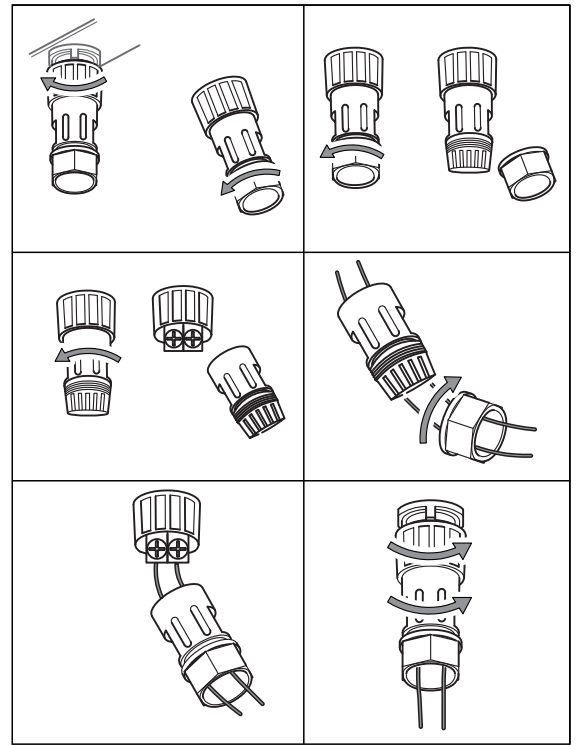


Pump output E.L.V socket (Output control normally open)

This socket is a normally open relay, when the heat pump is activated, the relay will close enabling external devices or products to be operated or controlled. An example of this is a heat demand controller which allows the water pump to run longer than the sanitization system or a water pump speed setting to control the speed of the pump when it is activated.

To connect to a heat demand system, unscrew the socket and connect to the two terminals, they are not polarity sensitive as it is a volt free relay

- 1- Enables control of a standalone water pump*
- 2- Enables control of heat demand controllers such as the Madimack MJ-box.
- 3- Enables control of a slave heat pump in multiple heat pumps install



OPERATION GUIDANCE

4.1 Key Function

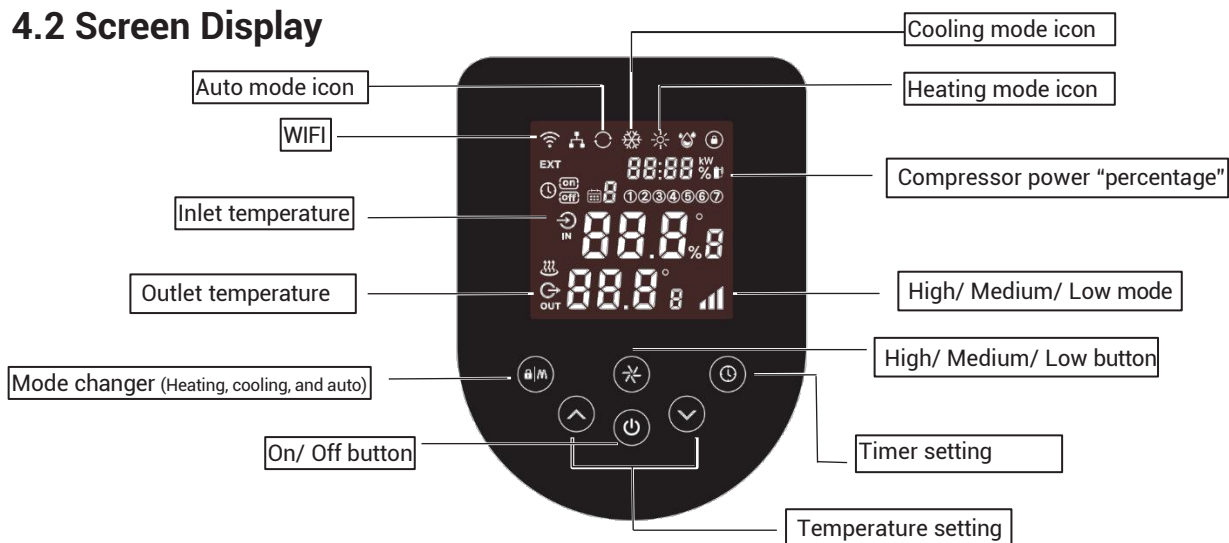


Symbol	Heating & cooling modes
	1. Power On/Off 2. Wi-Fi setting
	1. Heating mode (18°C ~ 40°C) 2. Cooling mode (12°C ~ 30°C) 3. Auto mode (12°C ~ 40°C)
	1. High mode 2. Medium mode 3. Low mode
	Temperature setting and navigation buttons
	Timer settings

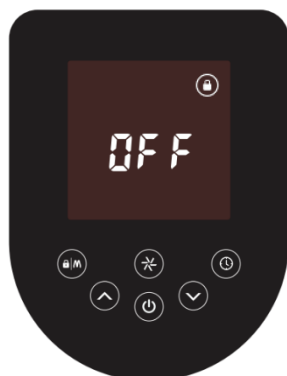
Attention:

- The controller has power-down memory function.

4.2 Screen Display



a. Unit turned off

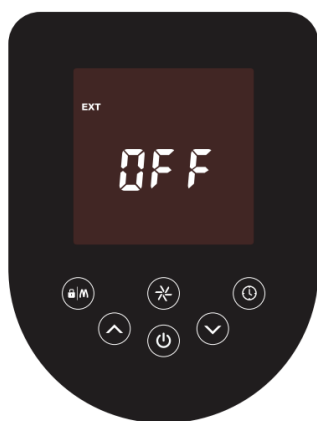


b. Power on



c. Unit turned off by an external controller

Only operational when switched on by the external controller.



How to troubleshoot your unit when your screen displays EXT OFF

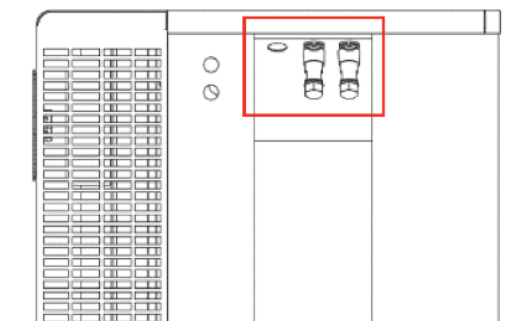
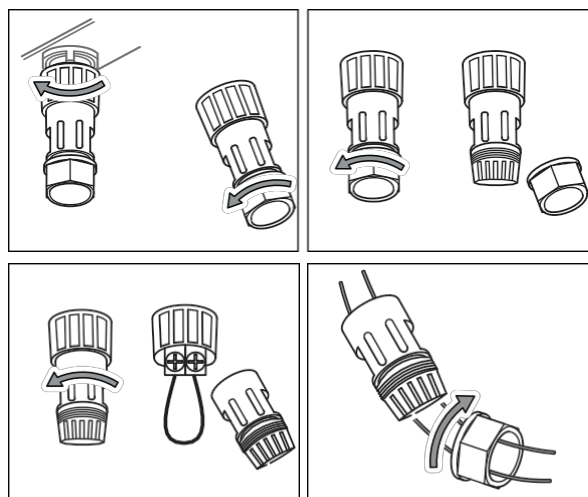


1. Check plugs are working.
2. Check your external controller is switched on.
3. Check the external controller connection is not loose.
4. Check the bridge cable on the control input socket has been removed. For older units, the bridge cable on terminals 5 and 6 has been removed or loose.

This can be found by unscrewing the top of your quick connect cable

5. In case of an automation system is connected to the heat pump:
 - Check the timers set on the automation system and make sure that the automation times are active. Once the timer is active the "off" will clear and the heat pump will start within few minutes.
 - Check that the heat pump option on the automation system is running the heat pump.
6. In case of no automation system is in place:

- Make sure that you have the quick connect socket (control input) plugged in properly inside the unit.
- If the above is ok, take out the control input socket and (check quick connect guide for a step-by-step instruction and make sure that the small wire inside is fitted in properly and is not loose.
- If the above is ok, remove the unit's top cover to access the electrical board (must be done by a professional electrician), "5" and "6", make sure that the wires on this terminal are fitted in properly and nothing is loose or off.
- If you are still facing issues please contact our technical line on 1300 899 737



4.3 Operation Instructions

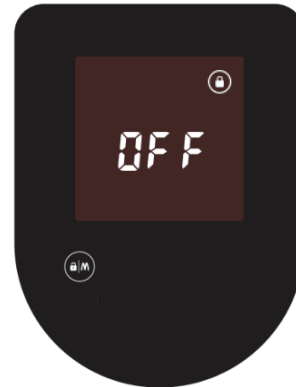
a. Screen Lock and switching on

1) There is an automatic screen lock function.
No operation for more than 30 seconds, screen will automatically lock, and screen will dim while the lock button will light on, and other button light will be off.

2) Press "a/m" for 3 seconds to unlock the screen; screen and buttons will light on.



3) Press "⏻" to power on and start controller.



b. Power On

Press "a/m" for 3 seconds to unlock screen
Press "⏻" to power on machine.

c. Temperature Setting

Press "▲" and "▼" to display and set desired temperature

d. Mode Selection

Heating/Cooling/Auto

Press "a/m" to switch between heating "🔥", cooling "❄️" and auto modes "🔄".

- 1) Heating mode "🔥" Water temperature setting range(18-40°C)
 - 2) Cooling mode "❄️" Water temperature setting range(5~30°C)
 - 3) Auto mode "🔄": Water temperature setting range(5~40°C)
- * When water inlet temperature (Pool temperature) is higher than set temperature, automatic cooling activates.
* When water inlet temperature (Pool temperature) is lower than setting point, automatic heating mode activates.

e. High/ Medium/ Low power mode

Heating mode: "🔥" to switch between High mode 📶, Medium mode 📶 and Low mode 📶.

Cooling and Auto mode: only support High mode, and Medium mode.

f. Operating frequency

Compressor icon lights on during operation.
Operation frequency speed will be showed on screen as



4.4 Advanced operational Instructions

a. Time setting

1) How to check current time: Screen can be displaying either the clock or the running speed at one time, in case the screen is displaying running speed percentage, press "⌚" to check the time, it will be display for 10 seconds, then it will go back to showing the running speed percentage.

2) Clock calibration

When displaying time on screen, press "⌚" to enter clock calibration, hours digit will start flashing, use "⬆" or "⬇" to set the hours (long press "⬇" or "⬆" to adjust faster).

Press "⌚" to confirm hour setting, the screen will then move to the minutes digits which will start flashing, use "⬆" "⬇" to set the minutes (long press "⬇" "⬆" to adjust faster).

Press "⌚" to confirm minutes se0ng, the screen will then move to enter weekday setting, weekdays will start flashing, use "⬇" or "⬆" to set the weekday. Press "⌚" to confirm and exit the clock calibration.

3) Timer setting

a. 7-day timer setting

Hold "⌚" for 5 seconds and release to enter weekly timer setting. Hours and minutes will start flashing.

Starting Timer Setting begins with the first day of the week 1(Monday), and "on" will be displayed

Adjust hour and minute by pressing "⬇" or "⬆" (long press "⬇" or "⬆" to adjust faster), press "⌚" to confirm and enter timer setting for automatically turn off time, "off" will display,

Adjust hour and minute by "⬆" or "⬇" (long press "⬆" or "⬇" to adjust faster), press "⌚" to confirm the Monday timer setting. Please note that this process will need to be repeated for every day of the week that you need the heat pump to turn on

If you want to skip one day to have no timer, press "⌚" twice to skip the day.

The timer setting is saved in memory only when setting has gone through the whole week (Monday to Sunday).

Press "⏻" anytime or don't click any buYons for 30 seconds to exit the timer setting and disregard any changes made

The day icon (example: 1) is always lit when the timer of that day is active.

b. Resetting timer

Long press "⌚" for 10 seconds to reset timer setting.

Attention The controller has a power-down memory function.

b. Defrosting

1. Automatic defrosting: When machine is auto defrosting, "  " will flash, and will automatically go back to the original mode,  will be solid.

2. Manual Defrosting: To enter forced defrosting mode, the compressor must be working for more than 10 minutes. in heating mode, press "  " and "  " on touch controller simultaneously for 5 seconds to start forced defrosting, "  " flashes indicating that defrost has started, "  " will stop flashing once defrost cycle is over and the unit will go back to the original mode.

(Remarks: the interval between each manual defrosting should be more than 30 minutes.)

c. Running Status Checking

1) Hold "  " for 5 seconds to enter running status check.

2) During this time, the screen will show the status symbol "C0" and its corresponding value.

3) Cycle through the different C values using "  " and "  ", the corresponding value will also change.

4) To return to the original screen Press "  " or otherwise the heater will automatically exit the status check after 30 seconds will exit "Running Status Checking" mode

5) Running status checking table:

Symbol	Content	Unit
C0	Inlet water temp	°C
C1	Outlet water temp	°C
C2	Ambient temp	°C
C3	Exhaust gas temp	°C
C4	Evaporator coil pipe temp	°C
C5	Return gas temp	°C
C6	Cooling coil pipe temp	°C
C9	Cooling plate temp	°C
C10	EEV opening angle	P
C11	DC fan speed	r/min

d. Temperature display conversion (Celsius/Fahrenheit)

When the screen is on, Press "  " and "  " simultaneously for 5 seconds to switch the display between degrees Celsius and degrees Fahrenheit.

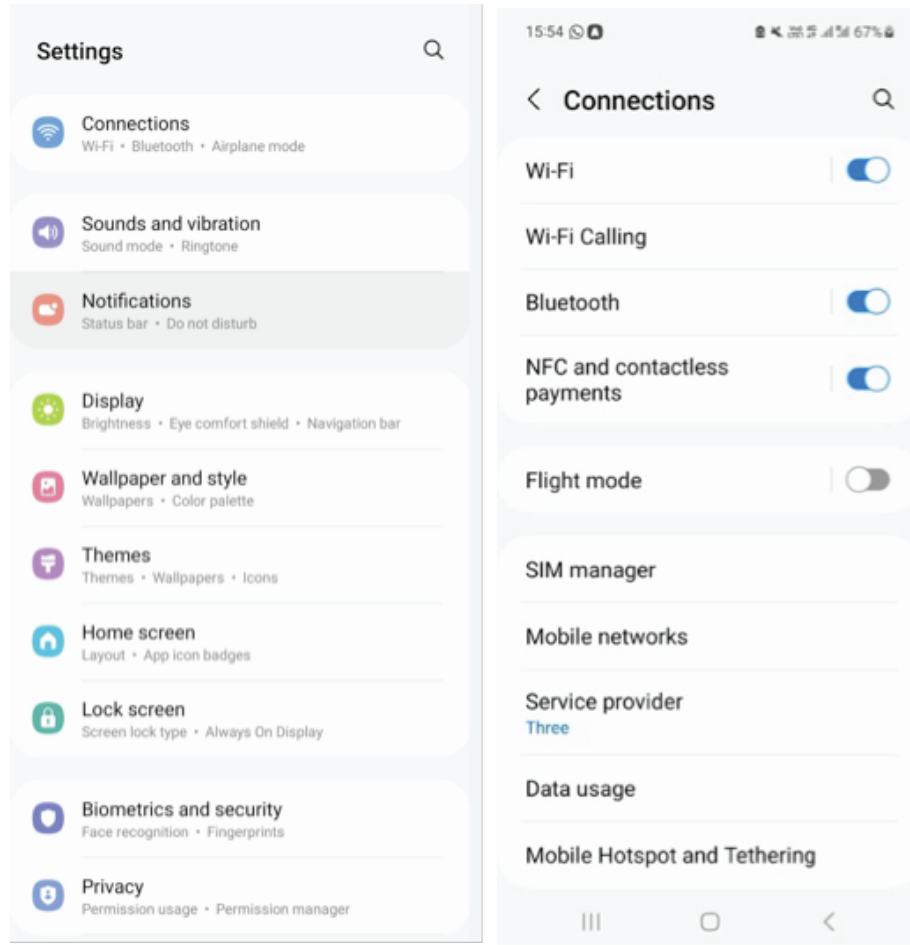
e. Running speed percentage/time display conversion

When the screen is on, press "  " and "  " simultaneously for 5 seconds to switch the display between running speed percentage and time.

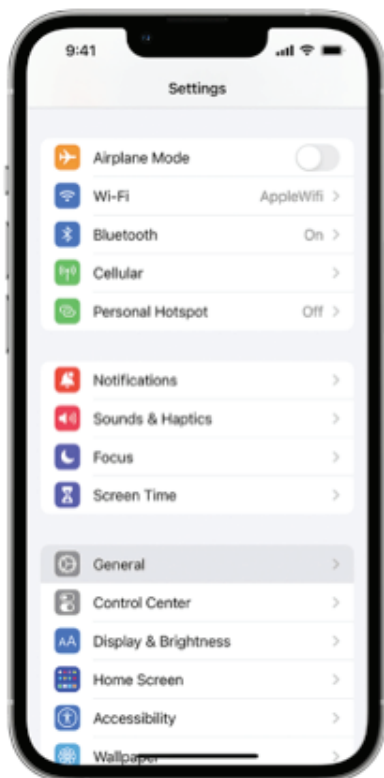
g. Wi-Fi

Before you start the WIFI process, please make sure both your Bluetooth and WIFI are turned on your mobile device. This can be seen below for Android and iPhone users

Android



iPhone



1) Wi-Fi connection

When the screen is on, press "⏻" for 3 seconds, after "📶" flashing, enter Wi-Fi connection.

Connect Wi-Fi on mobile phone and input password, and then control equipment by Wi-Fi. When APP connects Wi-Fi successfully, "📶" lights on.

2) WIFI reset (WIFI password change or the network configuration change)

Press "⏻" for 10 seconds, after "📶" slowly flashing for 60s, and lights off. Clear configuration records and repeat step 1).

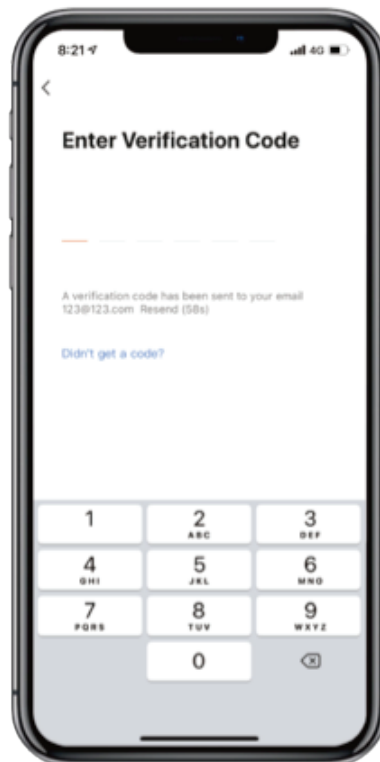
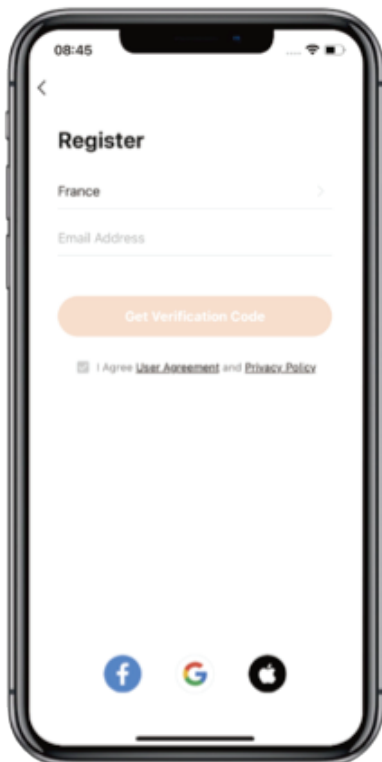
3) "📶" will always be on after connection.

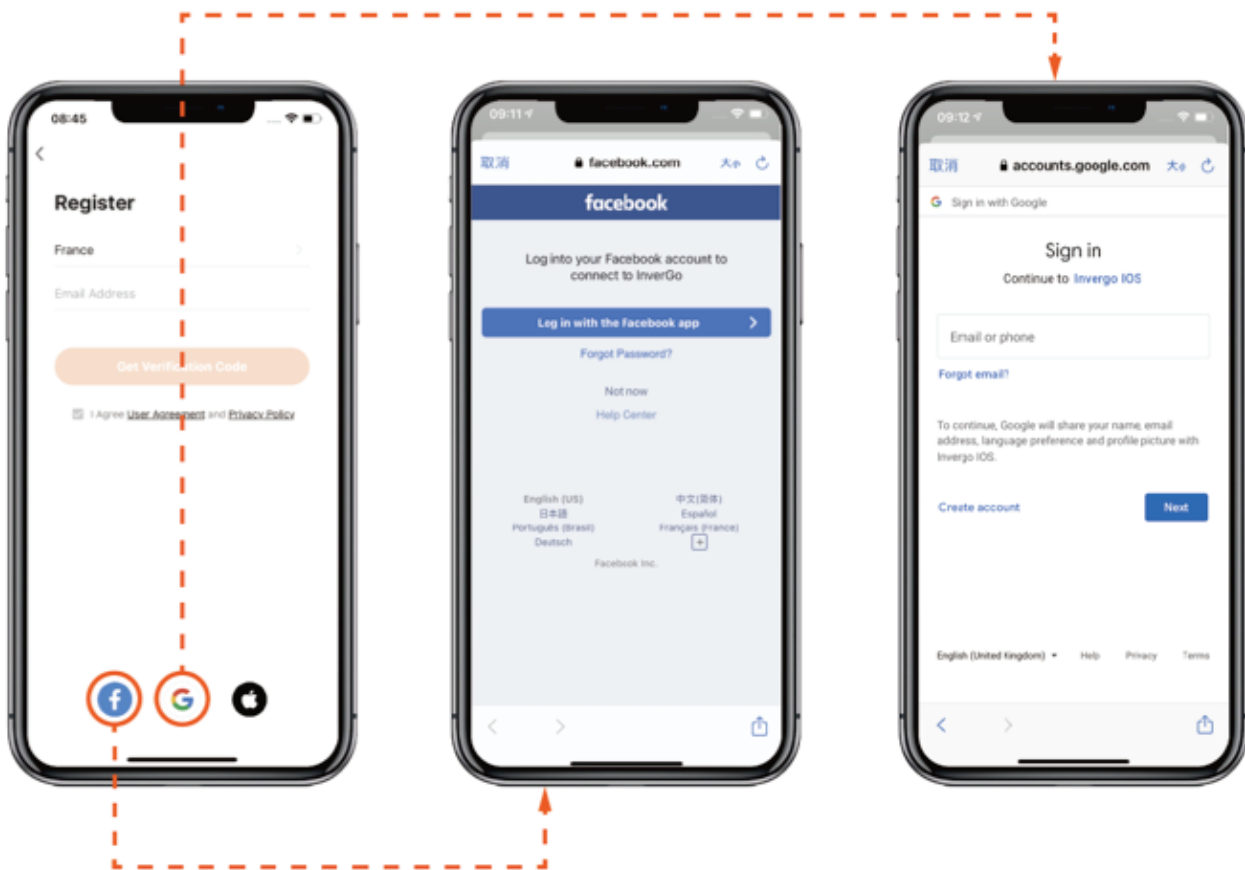
Please see picture on the next page for detailed instructions:

1

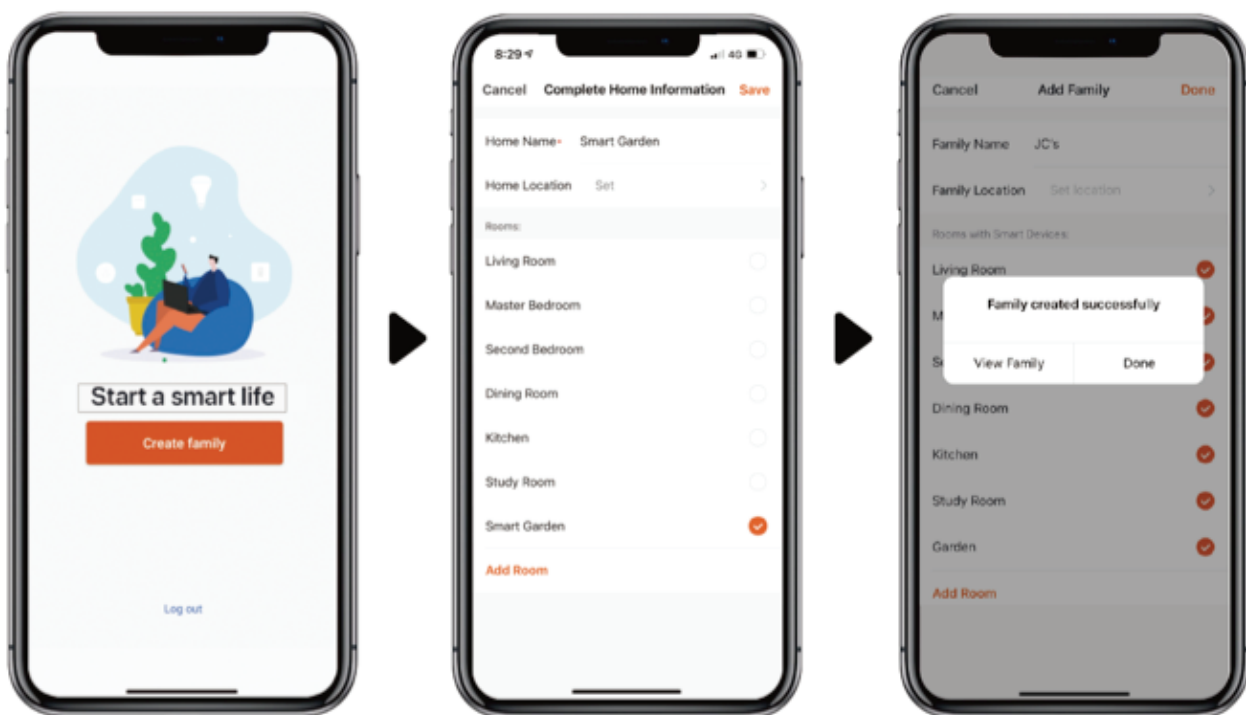


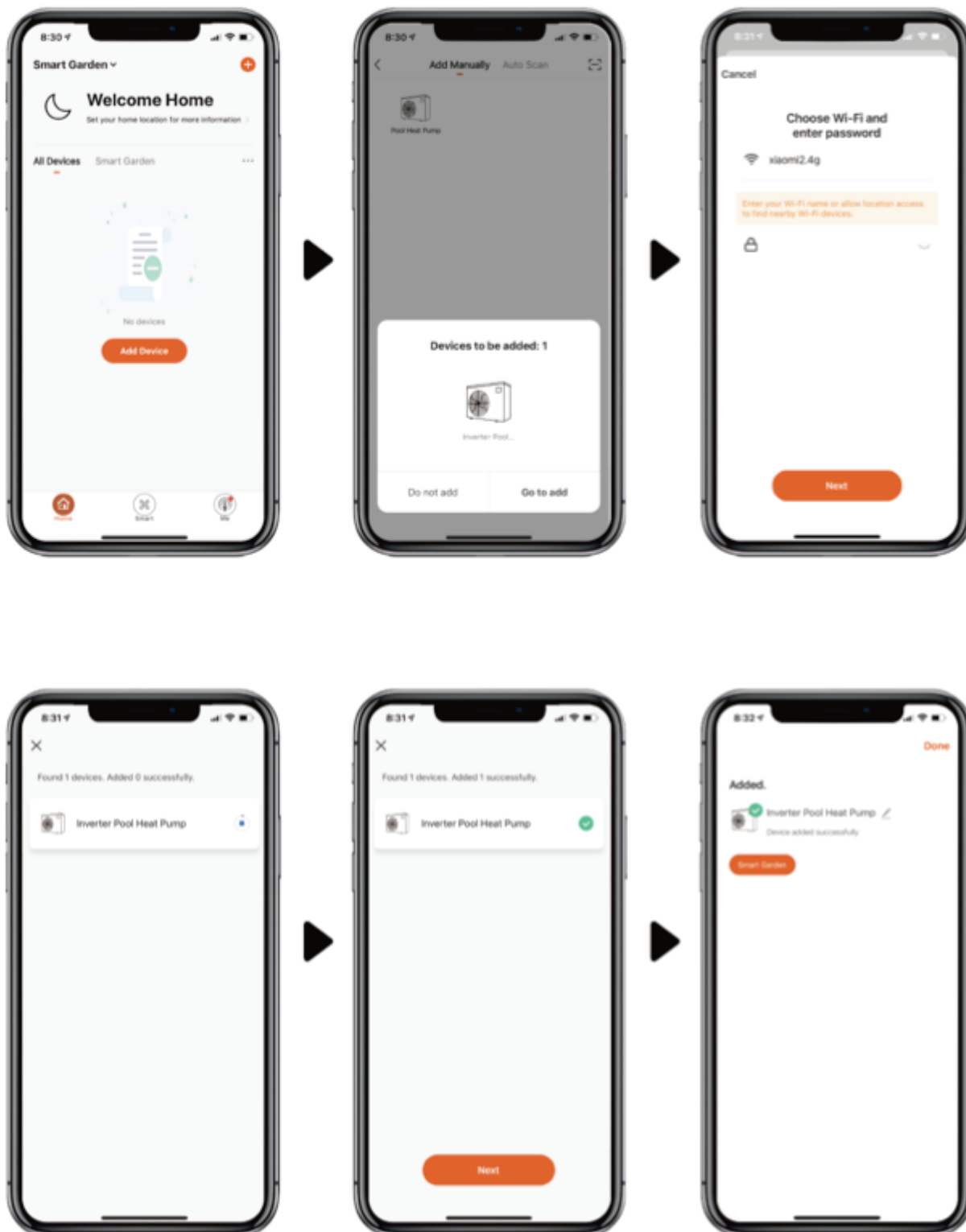
2

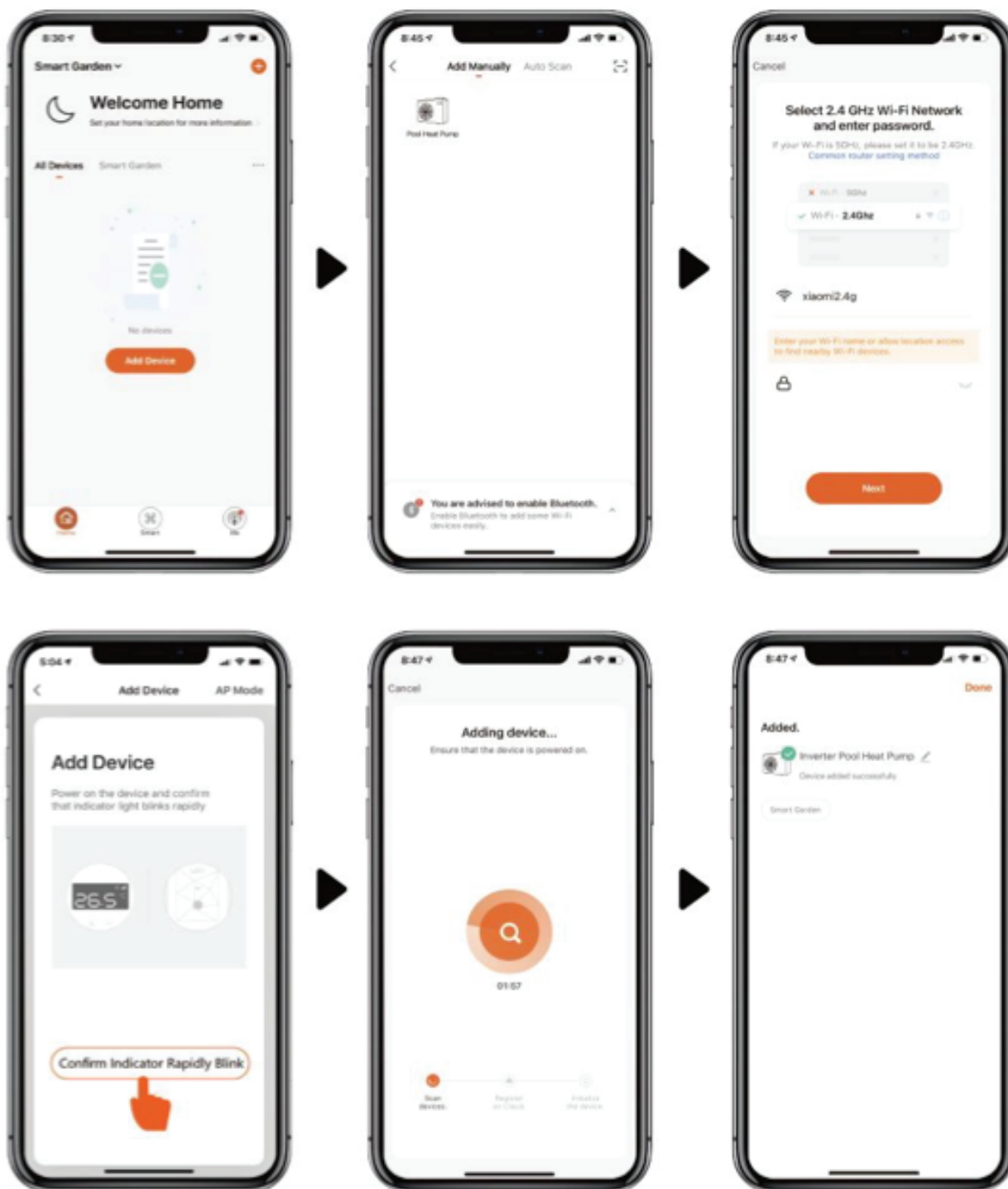




3



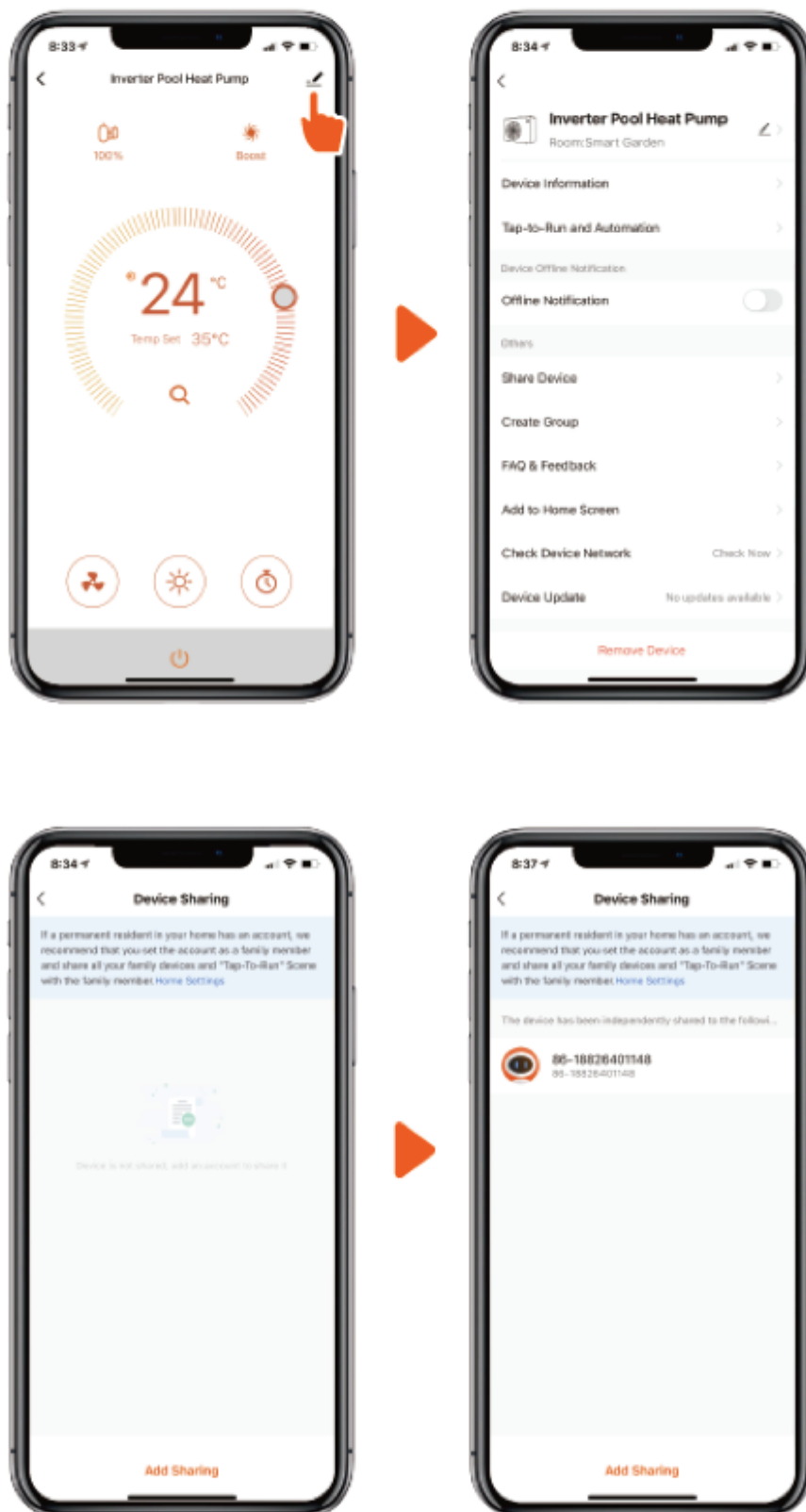




5



6 Sharing device with others



h. Defrost

Automatic defrosting: When machine is auto defrosting, "❄️" will flash, and return to previous working mode when it

- 1) Defrost mode usually lasts for around 15 minutes, during this period, the heat pump fan will stop running, and relatively louder noise will be heard. The heat pump will reverse the refrigeration cycle in an attempt to melt any frost that has formed on the internal components, therefore it's totally normal to witness higher condensation rate around the unit (Frost melting) and white smoke coming out of the unit (Water Vapor).
- 2) The whole process is completely automated and you don't need to worry about it.
- 3) In case the heat pump is engaging the defrost cycle multiple times within hours, and in temperatures above 16 – 17 degrees of ambient air this indicates that there is an issue in the ventilation, check the ventilation clearances section in the manual and make sure that your heat pump is fitted to the recommended distances.
- 4) Manual Defrosting: To enter forced defrosting mode, the compressor must be working more than 10 minutes. in heating mode, press "❄️" and "⬇️" on touch controller simultaneously for 5 seconds to start forced

(Remarks: the interval between manual defrosting should be more than 35 minutes.) Operation and end of Automatic and Manual defrosting is the same.

4.4 Advanced Operational Instructions

1. Heat pump checks before use

- a. Inspect heat pump before use
- b. The ventilating device and outlets are operating adequately and are not obstructed.
- c. It's prohibited to install refrigeration pipe or components in corrosive environment.
- d. Inspect the electric wiring on the basis of the electric wiring diagram and earthing connection.
- e. Double confirm the main machine power switch should be off.
- f. Check the temperature setting.

2. Leakage Detection Notice and Method

- a. Leakage checking is prohibited in closed areas.
- b. The ignition source is prohibited during the leakage inspection. A halide torch (or any other detector using a naked flame) shall not be used.
- c. Leakage detection fluids can be applied with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe.
- d. Vacuum completely before welding. Welding can only be carried out by professional personnel in the service center.
- e. Please stop using while gas leakage occurs, and contact professional personnel in the service center.

3. Trial

- a. The user must "Start the Pump before the Machine, and Turn off the Machine before the Pump", or the machine will be damaged.
- b. Before starting the heat pump, please check for any leakage of water and set the appropriate temperature, then switch on the power.
- c. In order to protect the swimming pool heat pump, the machine is equipped with a time lag starting function, the fan will run 1 minute earlier than the compressor when starting the machine, and it will stop running 1 minute later than the compressor when power

Running status checking

Press "❄️" for 5 seconds to enter running status checking. During this time, the display will show the status symbol "C0" and corresponding value. Change status through "⬆️" and "⬇️" to check corresponding

Press "❄️" to quit "Running Status

Running status checking

Running status checking

Symbol	Content	Unit
C0	Inlet water temp	°C
C1	Outlet water temp	°C
C2	Ambient temp	°C
C3	Exhaust gas temp	°C
C4	Evaporator coil pipe temp	°C
C5	Return gas temp	°C
C6	Cooling coil pipe temp	°C
C9	Cooling plate temp	°C
C10	Electronic Expansion Valve (EEV) opening angle	P
C11	DC motor fan speed (AC motor fan is unavailable)	r/min

1. "P" Parameters Checking

1.1 Press "✱" and "⬆" together for 5 seconds to enter "parameter checking" status, parameter code "NO.P0" will blink on the parameter value "2" will display on the

1.2 Press "⬆" Key and "⬇" Key to check the parameters.

1.3 Press "⏻" key to exit "parameter checking"

2. Modify parameters

2.1 In "parameter checking" status, press "✱" to enter "parameter setting" status. At this moment the "parameter value" will "⬆" and "⬇" to change the parameters

2.3 Press "✱" to confirm and return to the previous status; Or press "⏻" key to quit and return to the previous

3. Parameter Table

NO.	Content	Adjust range	Step length	Default
P0	Water pump running way	0: Continuation 1: Water temp control 2: time/water temp control	1	2
P1	Time setting (only available when the water pump running way is set to "2")	10 ~ 120min	5 min	60 min
P2	Compressor continuously running time in defrosting mode	30 ~ 90min	1min	35min
P3	Defrosting start temp	-17 ~ 0°C	1°C	-7°C
P4	Defrosting running time	1 ~ 12min	1min	12 min
P5	Defrosting quit temp	8 ~ 30°C	1°C	13°C
P6	Single pump option	On/off 50 ~ 100	1	off
P10	Compressor speed control	0: Auto, 1: Manual	1	0
P12	Electronic expansion valve overheat level (heating)	-10 ~ 20	1	3
P13	Electronic expansion valve overheat level (cooling)	-10 ~ 20	1	5
P14	Electronic expansion valve manual/auto	0: Auto, 1: Manual	1	0
P15	Electronic expansion valve opening setting (heating)	50 ~ 240	2P	175 (H5)
P16	Electronic expansion valve opening setting (cooling)	50 ~ 240	2P	175 (H5)
P20	Power off memory function	0 – NO, 1 – YES	1	1

Flow Rates

OPTIMUM FLOW RATE DIFFERENTIAL FROM INLET TO OUTLET IS BETWEEN 2-3 DEGREES

HIGHER TEMPERATURE SET POINTS REQUIRES HIGHER WATER FLOW AND SHOULD BE ONLY 0.5 -1 degree differential

Each Pool Heat Pump has a minimum flow rate requirement please check the specification table to ensure the circulation pump in use is adequately sized.

Calibrating the flow rate

By using the running status function on the touch controller, it is easy to calibrate the check valves installed for optimum flow rates through the heat pump.

Madimack Heat Pumps have a built-in flow switch which will deactivate the heating function if not enough water flow is detected. The Heat Pump has a large range operation up to a seven-degree differential. If the temperature differential is above 7 degrees, the built-in flow switch or E6 Error will be displayed indicating not enough flow detected.

PROBLEMS WITHOUT AN ERROR CODE

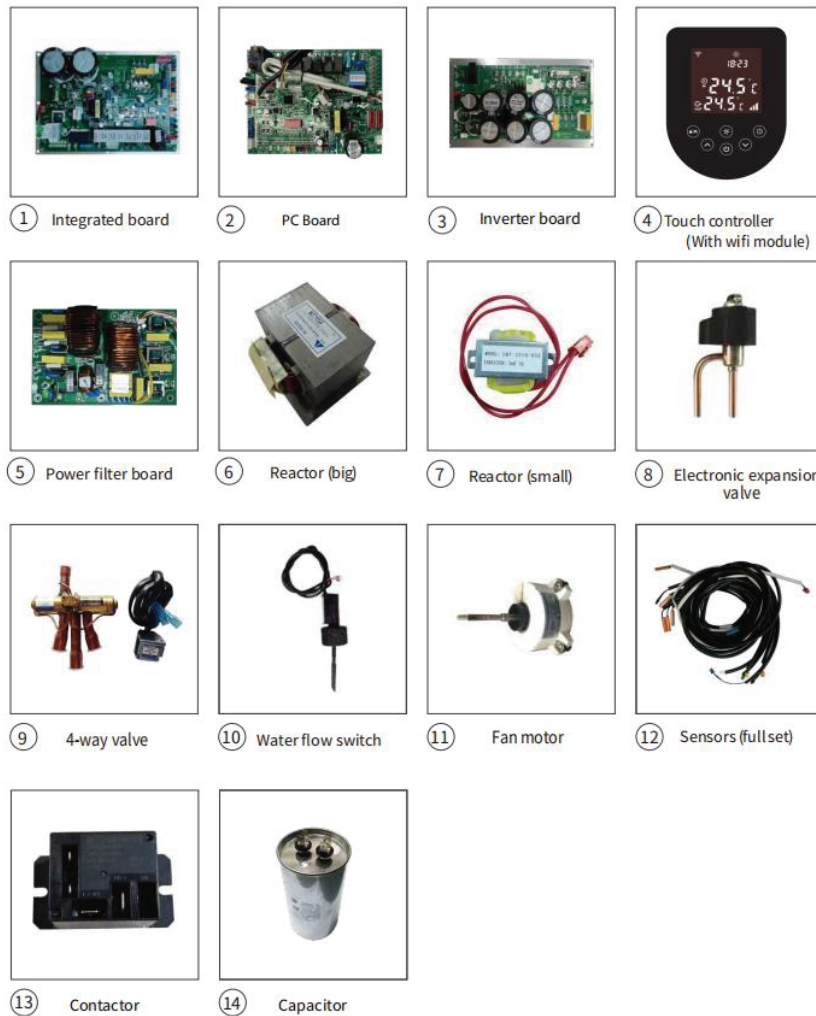
Failure	Reason	Solution
When powered on, the controller displays a code.	Startup code	This is not a failure. Please wait until it disappears.
Unresponsive controller	Some models have a screen lock function.	Hold the lock button until the controller beeps and illuminates
Heat pump doesn't run	Improper operation No power Unit is powered off Burned fuse The breaker is off Voltage anomaly	Make sure that the heat pump is switched on, click the power button after unlocking the controller. Electrician to check voltage across power terminals if needed.
Unit suddenly starts or stops running.	The unit may be in defrost. At this point the fan stops spinning and the heat indicator on the controller will flash. Some models have a timed power on/off function. Once the set temperature is reached, the heat pump will go back to heating	Not failure, the unit will switch back after defrosting automatically, louder noise, higher rate of condensation, and sometimes water vapor can be noticed coming out of the heat pump, that is normal and natural.
Fan running but with insufficient heating.	Evaporator blocked. Air inlet and/or outlet blocked. 3 minutes start delay protection for compressor	Make sure that flow rate and ventilation requirements are satisfied. Seek a swimming pool heating evaluation from Madimack team to check the heat pump ability to heat in certain conditions
Display normal, but no heating.	Set temperature too low, heat pump hibernates for an hour before checking the set temperature again	Make sure that the set temperature is higher than current temperature, if recently has been changed, reset the heat pump from the main power supply to read the new set temperature
Unit is releasing white smoke.	The unit is defrosting. Its not smoke, its water vapor	This is not a failure. Please wait until the unit finishes defrosting.
Unit is leaking water	In heating mode, condensation will be generated on the evaporator and released through the bottom of the unit	This is not a failure, make sure that your drain hose is connected and is going to a local drain point, units can produce up to 50 – 70L of water condensation per day as a result of heating pools
Screen Shows OFF	The screen is showing off but is powered on	Solution in section 6 on the next page
If above solutions don't work, please contact your installer with detailed information and your model number. Don't try to repair it yourself.		

PROTECTION AND FAILURE CODE

Error	Component corresponding	What did the error detect?	Solution
E1	High pressure protection	High gas pressure switch	1. Check waterflow and make sure its adequate as per the specs 2. Check ventilation clearances as per specs
E2	Low pressure protection	Low gas pressure switch	1. Check for any possible damage on the heat pump fins located at the back 2. Restart the heat pump
E3	No water protection	Low water flow rate	Make sure that water pump is running, check for any source of water restriction such as closed valve, blocked filter or skimmer box, blocked pipe
E4	3 phases sequence protection	Electrical power connection	Check the power connection to the pump
E5	Power supply excesses operation range (Not failure)		1). Restart the heat pump from the main power supply, switch off for 20 minutes then switch back on
E6	Excessive temp difference between inlet and outlet water (Insufficient water flow protection)	High temperature difference	Waterflow is too slow, increase the flowrate going through the heat pump, adjust bypass valves and any flow control valves to allow more water flow through the heat pump. Increase the speed of water pump if possible
E7	Water outlet temp too high or too low protection	Water flow rate in pipes	Check if there is any blockage in the inlets, outlets, and through the pipe
E8	High exhaust temp protection	Compressor overheating	Check ventilation and waterflow requirements

Electrical parts

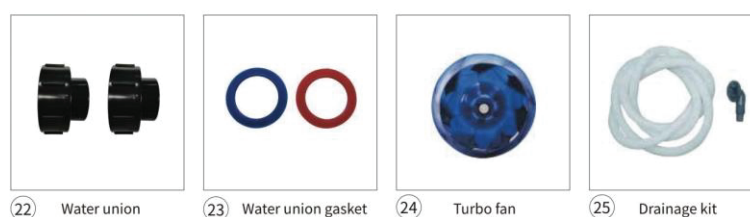
Electrical spare parts



Refrigerate system spare parts



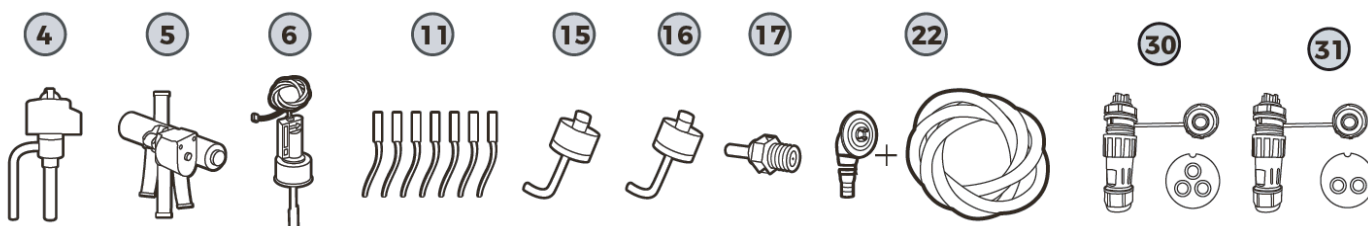
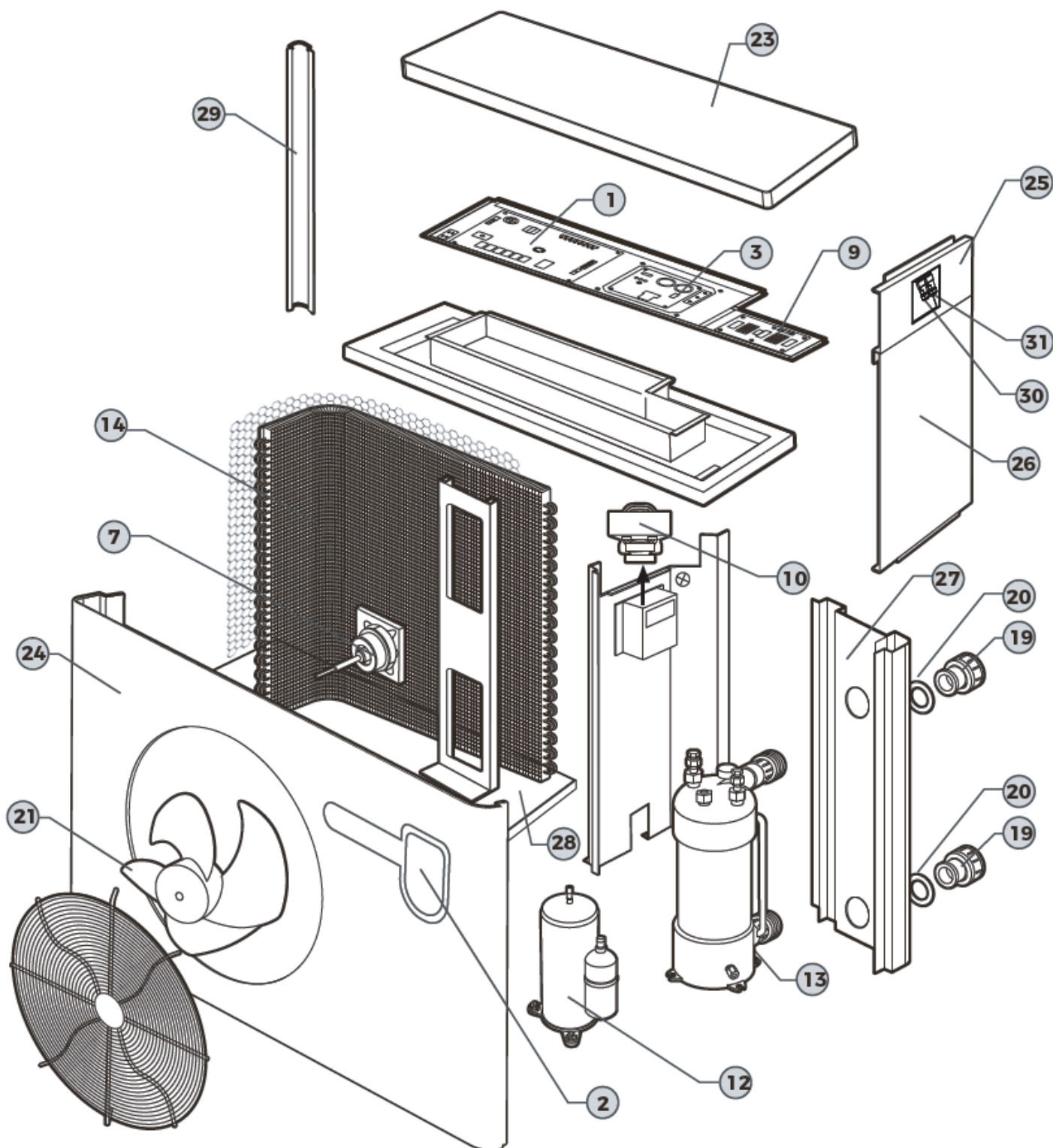
Others spare parts



ECO PLUS/90/130/160/200/240



ECO PLUS 240/280



WINTERISATION

The unit must be properly winterised to prevent damage to internal components during winter season before temperatures hit 32°F, 0°C. winterisation should be performed by a professional. Please see FAQ on website for proper winterisation steps.

Warranty Notice

Damage caused by freezing temperatures, residual water left inside the unit, improper drainage, or failure to follow the winterisation procedure is considered maintenance-related damage and is not covered under the Madimack warranty.

If the heat pump will not be used during winter or if freezing temperatures are expected, the unit must be properly winterised to prevent damage to internal components.

Failure to correctly winterize the heat pump may result in freezing damage to the titanium heat exchanger, water circuit, and internal pipework. Damage caused by improper winterisation or freeze damage is not covered under warranty.

Step 1: Disconnect Power

Turn the heat pump OFF using the controller and switch OFF the dedicated circuit breaker or disconnect supplying power to the unit.

Step 2: Shut Off the Pump

Turn OFF the filtration pump and stop all water flow through the heat pump.

If a bypass kit is installed, place the valves into the bypass position to isolate the heat pump from the circulation system.

Step 3: Drain Water

Disconnect the unions from both the water inlet and outlet connections and allow all water to completely drain from the heat pump.

Important: Water remaining inside the heat exchanger may freeze and expand, causing damage to internal components.

Step 4: Blow Out Remaining Water

Using a low-pressure air compressor or wet-dry/ shop vac, blow air through the outlet then inlet connections to remove all remaining water from the heat exchanger and internal pipework. Continue until no water remains in the unit.

Step 5: Secure and Plug Connections

Install protective plugs or caps on the inlet and outlet ports to prevent moisture, insects, critters, and debris from entering the heat pump during storage.

Step 6: Cover the Unit

If desired, cover the heat pump using a loose-fitting, breathable, weather-resistant cover. Do not use plastic wrap or airtight covers, as trapped moisture may cause corrosion or damage to electrical components.

Returning the Heat Pump to Service

Before restarting the heat pump after winter:

1. Remove any plugs or protective covers from the water connections.
2. Reconnect and tighten the inlet and outlet unions.
3. Return bypass valves to their normal operating position.
4. Start the filtration pump and check for leaks.
5. Restore electrical power to the heat pump.
6. Verify normal operation before use.

Limited Warranty

Standard Conditions: Madimack Pty Ltd (Australia) provide the following limited warranties. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province.

IMPORTANT - Full Terms and Durations:

For a complete list of warranty periods and product-specific terms, please visit the warranty section at www.madimack.com

Statutory Rights: This document sets forth the comprehensive terms and conditions governing the warranty provided by Madimack. These terms are in addition to, and not a modification of or subtraction from, the statutory warranties and other rights and remedies contained in applicable local legislation, including the Australian Consumer Law where applicable.

Limited Warranty Coverage: Please visit www.madimack.com for full duration and product-specific terms. Madimack will, at its discretion, repair or replace any product proven to be defective in materials or manufacture during the warranty period. This warranty applies to domestic installations only, is personal to the original purchaser, and is non-transferable.

Exclusions: To the extent permitted by law, Madimack excludes all statutory or implied conditions and warranties. Madimack shall not be liable for any incidental or consequential damages (such as water loss or damage to surrounding structures). The following exclusions apply:

- Incorrect installation or operation resulting from failure to follow provided instructions.
- Damage caused by misuse, neglect, or "acts of God."
- Repairs or servicing performed by unauthorized dealers.
- Faults caused by the use of non-specified accessories or chemicals.
- General wear and tear of consumable items (e.g., seals, O-rings).

Procedure for Warranty Claims:

1. Initial Contact: Owners must contact Madimack via the online portal at www.madimack.com or the support numbers listed below.
2. Remote Troubleshooting: A service agent will attempt to resolve the issue via phone or email.
3. Service Type Determination:
 - a. Return-to-Base: For portable or shippable units, you are responsible for disconnecting and transporting the product to an authorized service center. You are responsible for all freight and insurance costs to and from the supplier.
 - b. On-Site Service: For fixed equipment, Madimack may coordinate an on-site technician. You are responsible for providing clear and safe access to the unit.
 - c. Labor & Removal: You are responsible for the costs of removing the defective product and reinstalling the repaired/replacement product.

Required Documentation: All claims must include:

1. Proof of original purchase (Invoice with owner name and address).
2. A "Goods Return Authorization" or Service Ticket number provided by Madimack.

Australia

+61 1300 899 737
support@madimack.com
<https://madimack.com/au>

madimack