

madimack

*inver***ECO**

INSTALLATION MANUAL



Powered by  **INVERMAC**
TECHNOLOGY

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FOREWORD

Thank you for choosing the **Madimack** high efficiency inverter 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 <https://madimack.com/us/support/warranty/registration>.

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

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

We hope you enjoy using our heat pumps.

Thank you!

IMPORTANT

These installation instructions constitute an integral component of the product and are imperative for transmission to the installer, while also mandating retention by the end user. The warnings and directives contained within this manual demand meticulous reading and comprehension, as they furnish pivotal information pertaining to the safe handling and operation of the product. Consequently, this handbook must consistently remain accessible for subsequent reference.

The installation process must be executed in strict adherence to local regulations and the comprehensive guide issued by the manufacturer, all of which necessitate engagement by a qualified professional. For the purpose of this directive, a "qualified professional" is defined as an individual possessing the necessary skills, knowledge, education, training, and experience to perform any specific job relating to this equipment competently and safely.

It is imperative to acknowledge that any lapse in installation procedure could result in physical harm to individuals or animals, as well as mechanical damage, for which the manufacturer cannot, under any circumstances, be held liable.

Upon unpacking the heat pump, a thorough inspection should be conducted to identify and address any potential damage. Prior to the connection of the heat pump, it is necessary for the installer to ensure that the specifications outlined by Madimack correlate with the actual installation conditions and do not breach the authorized installation thresholds for the product in question.

Before embarking on any installation, manipulation, or repair work concerning the heat pump, it is important to isolate the electrical power supply to the unit. In the event of a malfunction and/or operational error with the heat pump, the electrical power supply must be severed, and no attempt should be made to rectify the issue. Repair activities should solely be carried out by an authorized technical assistance service, employing exclusively original spare parts. Failure to adhere to the aforementioned provisions may potentially compromise the operational safety of the heat pump and affect the warranty period.

To assure the efficiency and proper functioning of the heat pump, routine maintenance must be conducted in accordance with the instructions issued by Madimack. In the event of the sale or transfer of the heat pump to another user, it is incumbent upon the seller to ensure that all technical documentation is transmitted with the equipment for utilization by the new user or installer including the original invoice.

It is crucial to emphasize that this heat pump may exclusively be employed for the purpose for which it was expressly designed: heating a swimming pool. Any alternative applications are to be considered inappropriate, erroneous, or even perilous.

All contractual or non-contractual liabilities of Madimack products shall be deemed null and void in relation to any damage stemming from installation or operational lapses, or the failure to adhere to the instructions provided by Madimack or the applicable installation standards pertaining to the equipment detailed in this document.

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 professionally.
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 drain pipe 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.

SECTION 2

SAFETY PRECAUTIONS

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

We have provided important safety messages in this manual and on your heat pump. Please always read and obey all safety messages.

2.1 Warning



The 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.



b. It must be placed in well ventilated area, indoor or closed area is not allowed.



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



d. Vacuumize completely before welding. Welding can only be carried out by professional personnel in service center.

2.2 Attention

- a. Please read the following instructions before installation, use and maintenance.
- b. Installation must be done by professional staff only in accordance with this manual.
- c. Leakage test must be performed after installation.
- d. Please don't stack substances, which will block air flow near inlet or outlet area, otherwise the efficiency of the heat pump will be reduced or even stopped.
- e. Set proper temperature in order to get comfortable water temperature to avoid overheating or overcooling.
- f. In order to optimize the heating effect, please install heat preservation insulation on pipes between swimming pool and the heat pump, and please use a recommended cover on the swimming pool.
- g. Connecting pipes of the swimming pool and the heat pump should be $\leq 10\text{m}$.
- h. Except for the methods recommended by the manufacturer, do not use any methods to accelerate the defrosting process or clean the frosted parts.
- i. If a repair is required, please contact the nearest after-sales service center. The repair process must be strictly in accordance with manual. All repair practice by non-professional is prohibited.
- j. Don't use or stock combustible gas or liquid such as thinners, paint and fuel to avoid fire.
- k. This unit can only be installed outdoors.
- l. This unit can only be connected to a power source with a single complete cord.

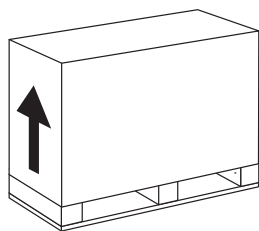
2.3 Safety

- a. Please keep the main power supply switch far away from the children.
- b. When a power cut happens during operating, and later the power is restored, the heat pump will start up.
- c. Please switch off the main power supply in lightening and storm weather to prevent from machine damage that caused by lightning;
- d. Safety inspection must be carried before the maintenance or repair for heat pumps with R410A gas in order to minimize the risk.
- e. Installation and any repairing should be conducted in the area with good ventilation. The ignition source is prohibited during the inspection.
- f. If the R410A gas leaks during the installation process, all operations must be stopped immediately and call the service center.

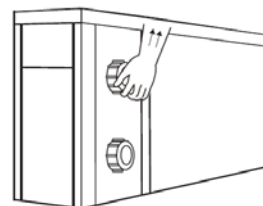
ABOUT YOUR HEAT PUMP

3.1 Transportation

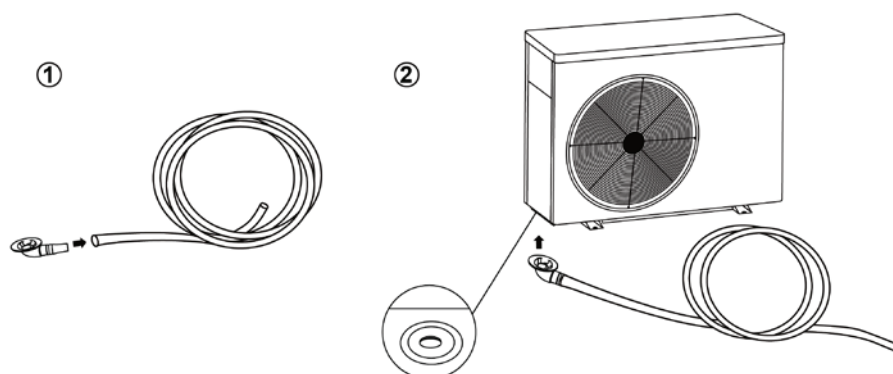
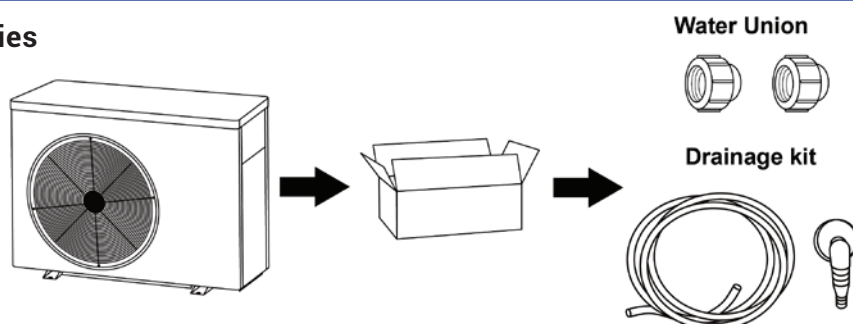
a. Always keep upright



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



3.2 Accessories



Connection of condensate drain

3.3 Operating condition and range

To provide you comfort and pleasure, please set swimming pool water temperature efficiently and economically. The heat pump can work between air 32°F-109°F, and its ideal operation range is between air 59°F-77°F.

3.4 Introduction of different modes

- a. The heat pump has two modes: Boost and Silence.
b. They have different strengths under different conditions.

Mode	Modes	Strength
	Boost mode	Heating capacity: 20% to 100% capacity Intelligent optimization Fast heating

Mode	Modes	Strength
	Silence mode	Heating capacity: 20% to 80% capacity Sound level: 3dB(A) lower than Boost mode

3.5 Technical parameter

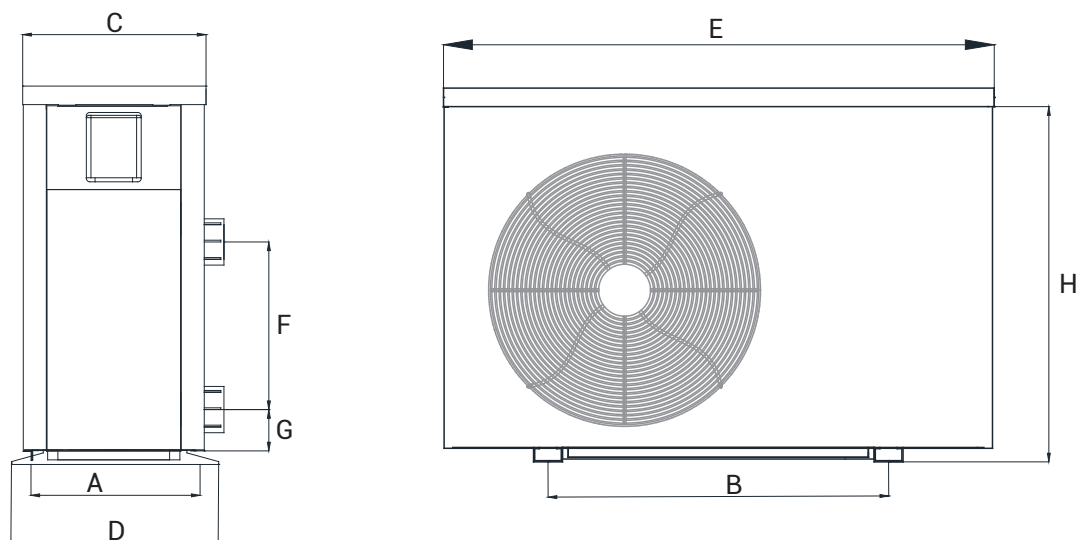
Model	inverECO 32,000	inverECO 40,000	inverECO 50,000	inverECO 66,000
Model Number	IEAC320	IEAC400	IEAC500	IEAC660
SKU	INVECO320	INVECO400	INVECO500	INVECO660
PERFORMANCE CONDITION: AIR 80°F / WATER 80°F / HUMIDITY 80%				
Heating capacity (BTU)	31,500	37,000	46,000	61,000
COP Range	6.4	5.8	6	6
PERFORMANCE CONDITION: AIR 80°F / WATER 80°F / HUMIDITY 63%				
Heating capacity (BTU)	30,000	36,000	44,000	57,500
COP Range	6	5.4	5.7	5.6
PERFORMANCE CONDITION: AIR 50°F / WATER 80°F / HUMIDITY 63%				
Heating capacity (BTU)	16,000	19,500	19,000	25,000
COP Range	4	4	4.1	4.9
TECHNICAL SPECIFICATIONS				
Cooling capacity (BTU)	16,800	19,600	21,500	27,000
Temperature set point range (°F/ °C)	64~104/ 18~40			
Operating air temperature (°F/ °C)	32 ~ 109/ 0~42.8			
Heat exchanger	Titanium in PVC			
Power supply	208V ~ 230V/1 Ph/60Hz			
Electrical Connection	Hardwired (3 × 12 AWG/ 3 × 4.0 mm ²)	Hardwired (3 × 12 AWG/ 3 × 4.0 mm ²)	Hardwired (3 × 10 AWG/ 3 × 6.0 mm ²)	Hardwired (3 × 10 AWG/ 3 × 6.0 mm ²)
Minimum Circuit Ampacity (MCA)	15	15	25	25
Max. Rating Overcurrent Protection (MOP)	20	20	25	25
Rated input power (kW) at air 80°F	0.22 ~ 1.40	0.31 ~ 1.95	0.38 ~ 2.36	0.50 ~ 3.12
Rated input current (A) at air 80°F	0.96 ~ 6.09	1.36 ~ 8.48	1.65 ~ 10.26	2.17 ~ 13.57
Maximum input current (A)	10.8	10.8	12.8	16.8
Sound level at 10ft dB(A)	33.2 ~ 45.0	33.8 ~ 45.2	34.7 ~ 45.8	38.4 ~ 47.1
Advised water flux/ flow ± 20% (GPM/ LPM)	13.2 ~ 17.7/ 50 ~ 67	17.7 ~ 26.4/ 67 ~ 100	21.9 ~ 30.6/ 83 ~ 116	28.5 ~ 37.5/ 108 ~ 142
Water pressure drop(Kpa)	3	3	3.5	4
Water connection (inch/ mm)	1.5"/ 40 mm			
Refrigerant Gas	R410A			
Net dimension LxWxH (inch/ mm)	37.6" × 12.5" × 25.5"/ 954 × 318 × 647	37.6" × 12.5" × 25.5"/ 954 × 318 × 647	37.6" × 12.5" × 25.5"/ 954 × 318 × 647	37.6" × 15.3" × 25.5"/ 954 × 388 × 648
Net Weight (lb/kg)	108/ 49	108/ 49	123.5/ 56	141.1/ 64
Gross Weight (lb/kg)	125.7/ 57	125.7/ 57	141.1/ 64	160.9/ 73
Packaging dimension LxWxH (inch/ mm)	40.9" × 14.8" × 26.4"/ 1040 × 375 × 670	40.9" × 14.8" × 26.4"/ 1040 × 375 × 670	40.9" × 14.8" × 26.4"/ 1040 × 375 × 670	40.9" × 17.7" × 26.6"/ 1040 × 450 × 675

Remarks:

This heat pump is able to perform normal within air temp air 32°F- 109°F, efficiency will not be guaranteed out of this range. Please note that the performance and parameter performance of this product are different under different conditions.

Related parameters are subject to adjustment periodically for technical improvement without further notice. For details please refer to nameplate.

3.6. Dimension



Size(mm) / Name / Model	A	B	C	D	E	F	G	H
InverEco 32,000	334	590	318	359	954	290	75	647
InverEco 40,000	334	590	318	359	954	290	75	647
InverEco 50,000	334	590	318	359	954	330	75	647
InverEco 66,000	404	590	388	429	954	360	74	648

※ Above data is subject to modification without notice.

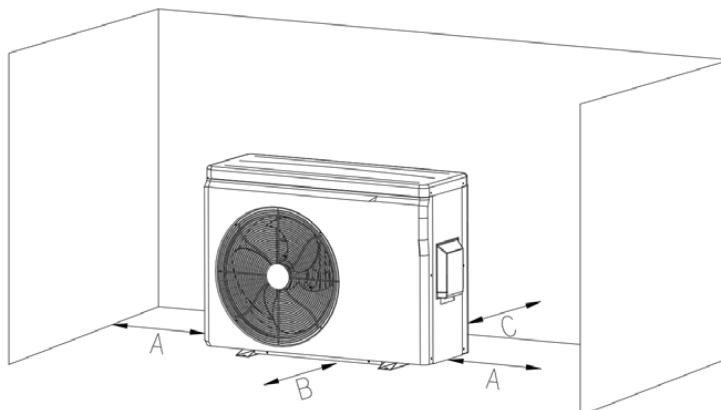
Note:

The picture above is the specification diagram of the pool heat pump, for technician's installation and layout reference only. The product is subject to adjustment periodically for improvement without further notice.

INSTALLATION GUIDANCE

Ventilation requirements: 1st case: Single unit – 3 obstacles

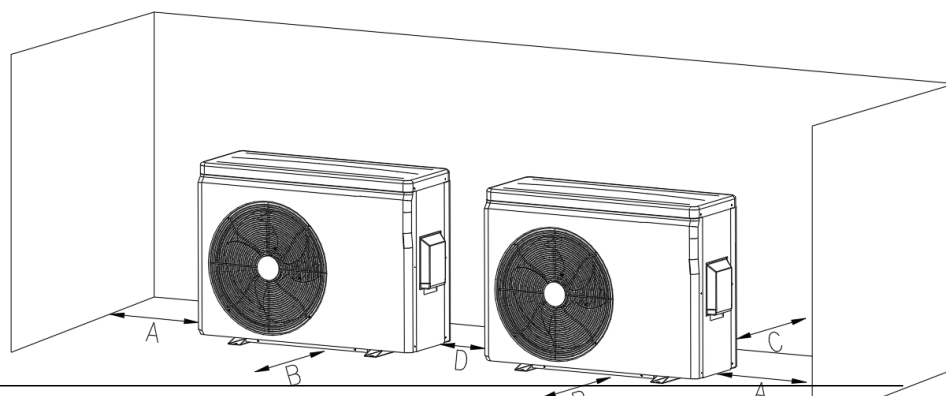
1500mm/ 60"
clearance above



Model	InverEco 32,000		InverEco 40,000		InverEco 50,000		InverEco 66,000	
Distance A	mm	700	mm	700	mm	700	mm	700
	inch	28	inch	28	inch	28	inch	28
Distance B	mm	2500	mm	2500	mm	2500	mm	2500
	inch	100	inch	100	inch	100	inch	100
Distance C	mm	500	mm	500	mm	500	mm	500
	inch	20	inch	20	inch	20	inch	20

Ventilation requirements: 2nd case: Multiple units – 3 obstacles

1500mm/ 60"
clearance above

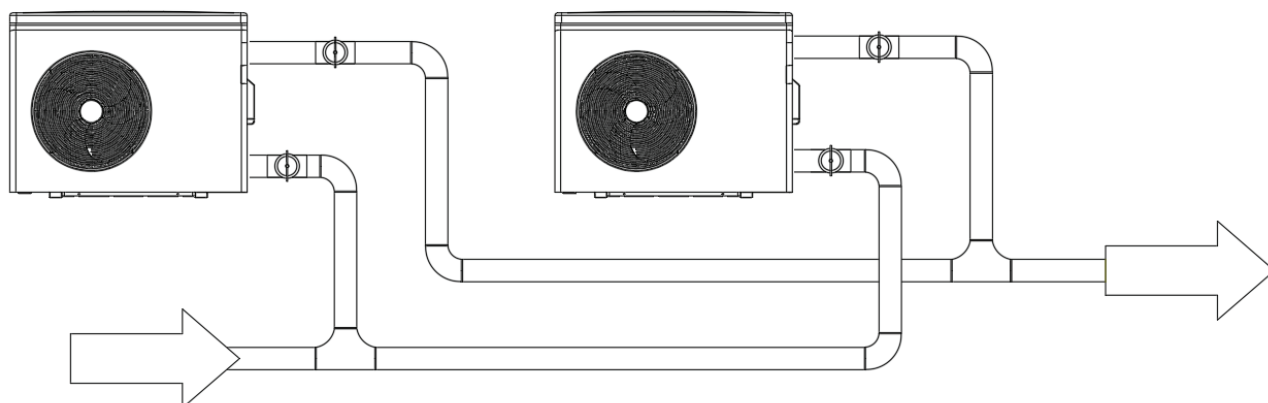


Model	InverEco 32,000		InverEco 40,000		InverEco 50,000		InverEco 66,000	
Distance A	mm	700	mm	700	mm	700	mm	700
	inch	28	inch	28	inch	28	inch	28
Distance B	mm	2500	mm	2500	mm	2500	mm	2500
	inch	100	inch	100	inch	100	inch	100
Distance C	mm	500	mm	500	mm	500	mm	500
	inch	20	inch	20	inch	20	inch	20
Distance D	mm	1400	mm	1400	mm	1400	mm	1400
	inch	56	inch	56	inch	56	inch	56

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. 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.

IMPORTANT: Allow sufficient space around the unit for maintenance and service work. Restricted access may prevent warranty or service work and may result in additional costs.

Plumbing multiple units



Multiple heat pumps acting as one system should be connected in Cascade (Parallel Connection). Adequate flowrate 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 above represents the cascade connection

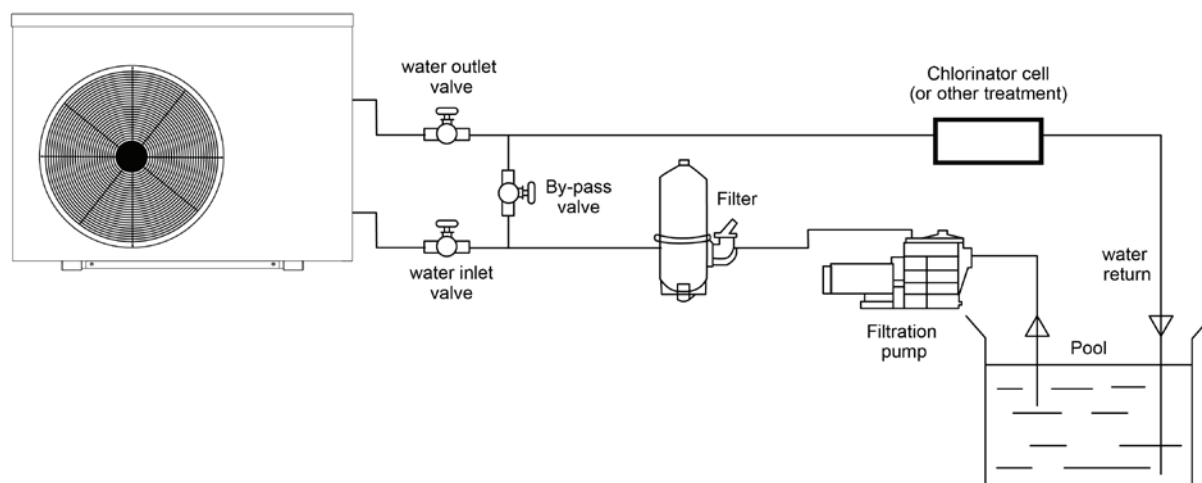
4.1 Installation reminder

Only a professional staff is allowed to install the heat pump. The users are not qualified to install by themselves, otherwise the heat pump might be damaged and risky for users' safety.

a. Location and dimension

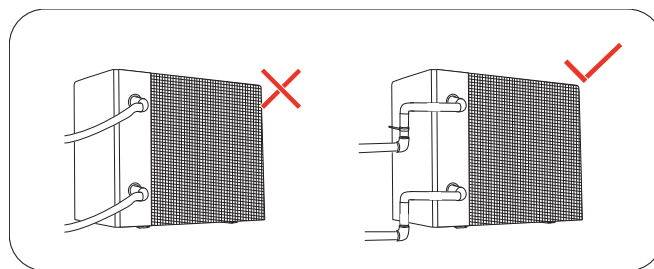


The inverter pool heat pump should be installed in a good ventilation place.



- 1) The frame must be fixed by bolts (M10) to concrete foundation or brackets. The concrete foundation must be solid and fastened; the bracket must be strong enough and antirust treated;
- 2) Please don't stack substances that will block air flow near inlet or outlet area, and there is no barrier within 50cm behind the main machine, or the efficiency of the heat pump will be reduced or even stopped;
- 3) The machine needs an appended pump (Supplied by the user). The recommended pump specification-flux: refer to Technical Parameter, Max. lift $\geq 10\text{m}$;
- 4) 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.

**b. The inlet and outlet water unions can't stand the weight of soft pipes.
The heat pump must be connected with hard pipes!**

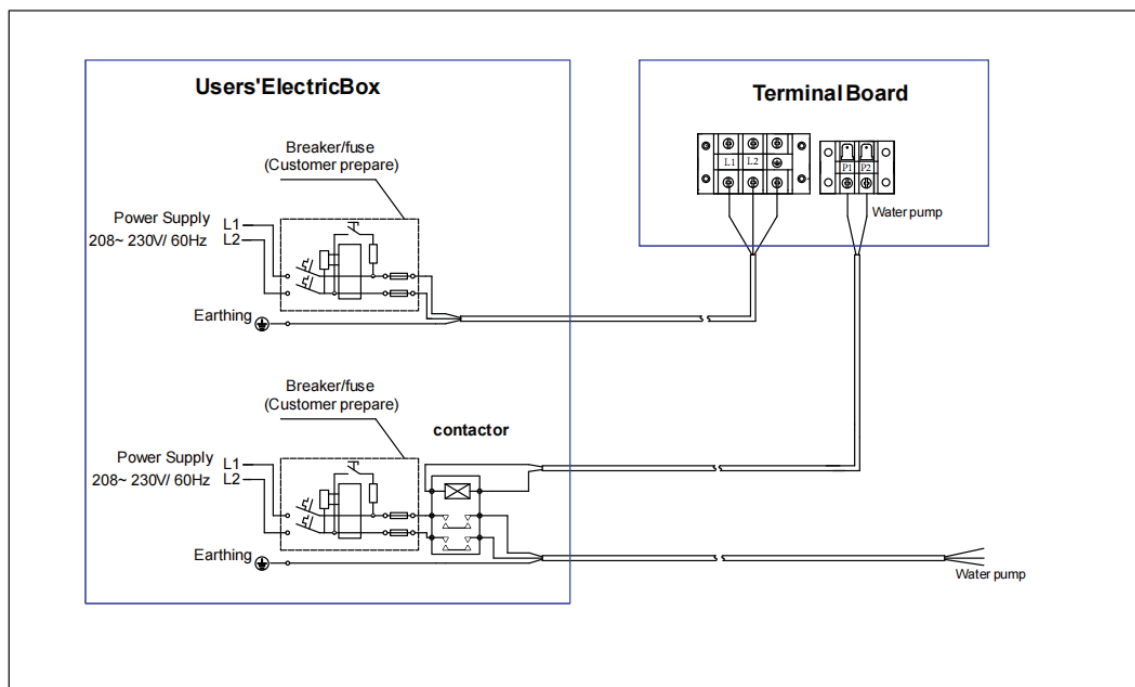


4.2 Wiring

- Connect to appropriate power supply, the voltage should comply with the rated voltage of the products.
- Earth the machine well.
- Wiring must be handled by a professional technician according to the circuit diagram.
- Set leakage protector according to the local code for wiring (leakage operating current $\leq 30\text{mA}$).
- The layout of power cable and signal cable should be orderly and not affecting each other.
- The appliance shall be installed in accordance with national wiring regulations.

4.3 Electric wiring diagram

For power supply: 230V 50/60Hz



- Must be hard wired, plug is not allowed.
- The swimming pool heat pump must be earthed well.
- The power cord and signal wire must be installed with conduit.
- WARNING:** Before obtaining access to terminals, all supply circuits must be disconnected.

4.4 Reference for protecting devices and cable specification

MODEL		InverEco 32,000	InverEco 40,000	InverEco 50,000	InverEco 66,000
Breaker	Rated Current (A)	13	13	16	20
	Rated Residual Action Current (mA)	30	30	30	30
Fuse (A)		13	13	16	20
Power Cord (AWG)		3×13	3×13	3×13	3×11
Signal cable (AWG)		3×20	3×20	3×20	3×20

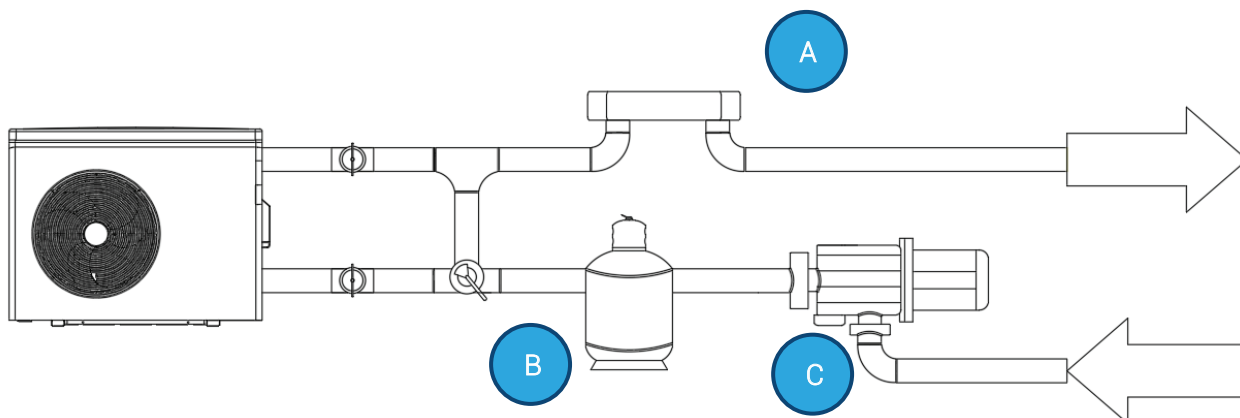
Above data is subject to modification without notice.

Note: The above data is adapted to power cord $\leq 10\text{m}$. If power cord is $> 10\text{m}$, wire diameter must be increased. The signal cable can be extended to 50m maximally

Installation options:

a. 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.



A: Chlorinator

B: Filter

C: Pool pump

1. Chlorinator controller initiates the filtration pump.
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 circulation pump is not running and no flow is detected 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.

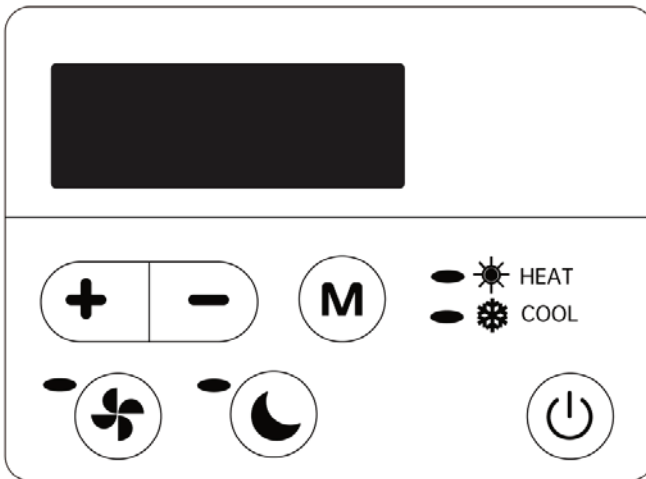
Automation systems and additional controls

The unit comes prewired 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"

OPERATION GUIDANCE

5.1 Key Function



Symbol	Function
	Power On/Off
	Heating/Cooling/Auto mode
	Press to start Boost mode
	Press to start Silence mode
	Temperature Setting Heating mode(64°F-104°F) Cooling mode(54°F-86°F) Auto mode(54°F-104°F)

Attention:

The controller has power-down memory function.

5.2 Operation Instruction

a. Power On & Power Off

Press to power on or power off machine.

b. Temperature Setting

Press to display and adjust temperature.
 Heating mode(64°F-104°F)
 Cooling mode(54°F-86°F)
 Auto mode(54°F-104°F)

c. Mode Selection

1) Heating/Cooling/Auto

Press to choose heating, cooling and automatic mode.
 In heating mode: □ light is on.
 In cooling mode: □ light is on.
 Automatic mode: Both □ and □ lights are on.

2) Silence/Boost mode selection

Press to start boost mode, and light will turn on.

Press to start silence mode, and light will turn on.

Please choose boost mode for initial heating.

a) Defrosting

i. Automatic active defrosting:

When the machine is operating in low temperatures it is very common for ice to build up on the external coil. The heat pump has a built in defrost protection program which will activate when it senses ice starting to form.

When machine is defrosting, ☀ starts flashing; after defrosting ☀ is on continuously.

ii. Forced defrosting:

: If the heat pump requires manually defrosting for testing or a sensor is faulty please follow these instructions, the machine must be in heating mode and the compressor is working continuously for more than ten minutes, Whilst the unit is running, press  and  on the controller simultaneously and hold for 5

seconds. When the ☀ symbol is flashing, defrost has started, and will continue until the external coil temperature reaches a certain temperature adequate for continued operation. If the ☀ symbol stops flashing forced defrost has stopped.

Note 1: the interval between forced defrosting should be more than 30 minutes apart.

Note 2: Defrost mode usually last 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 have formed on the internal components, therefore its totally normal to witness higher condensation rate around the unit (Frost melting) and white smoke coming out of the unit (Water Vapor).

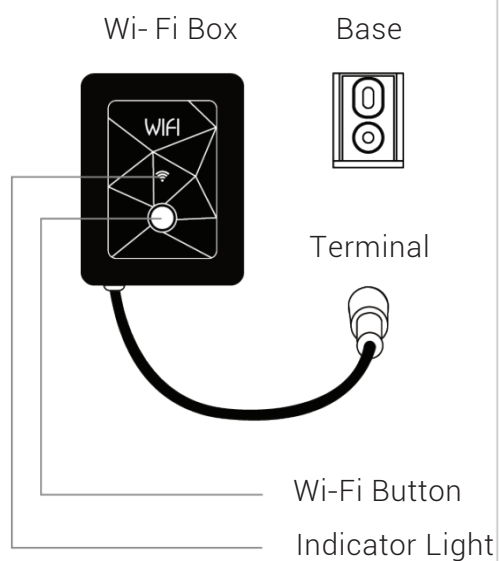
5.3 WiFi Operation

For video tutorials and further help please visit www.Madimack.com.au FAQ for all you need to do and full walkthrough. It is crucial that the WiFi is over the machine and is of a high power, the WiFi is a cloud based solution and needs the WiFi to be active on the machine for it to receive a signal.

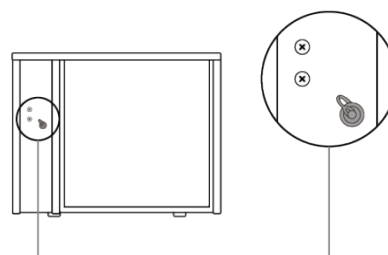
- a. Make sure to switch off your data package on your phone prior pairing the heater, Mobile data can interrupt the connection process in some cases therefore failing to connect the unit.
- b. Your phone should be displaying full Wi-Fi strength with -50 DB > to ensure that you have enough signal strength for the heater to connect
- c. To reset the Wi-Fi settings on the heater, do the following:
 - I. Unlock the controller by holding the lock button on the far left for 3 seconds, the buttons will illuminate indicating that the controller is unlocked.
 - II. Hold The power button (for about 10 seconds) till you see the Wi-Fi signal on the controller flashing slowly
 - III. Slow Wi-Fi signal blinking means that the settings have been reset, follow the same instructions below to pair the heater with your mobile device

WI-FI OPERATION (OPTIONAL)

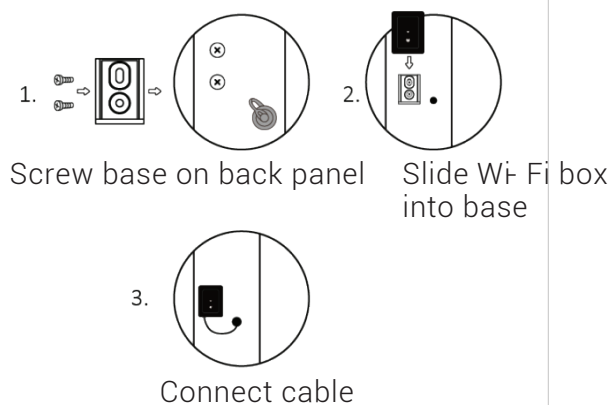
Components



Install position



Installation



① InverGo Download



Android



iOS

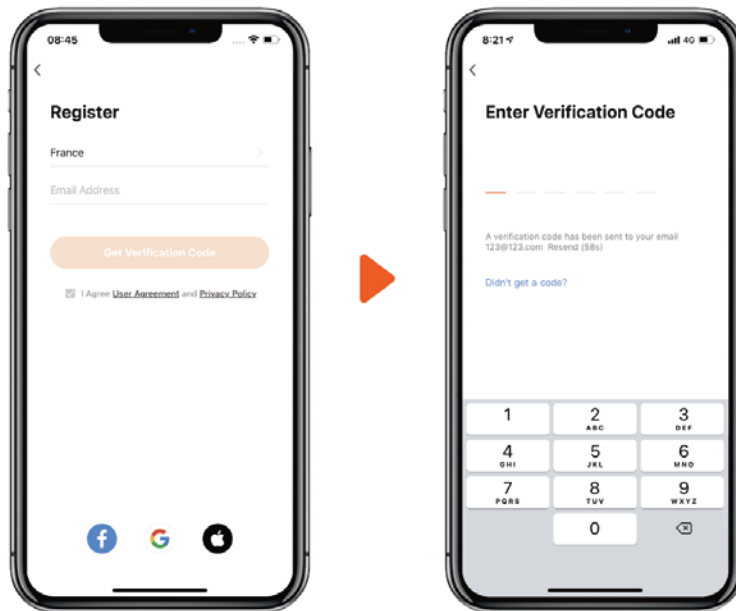


② Account Registration

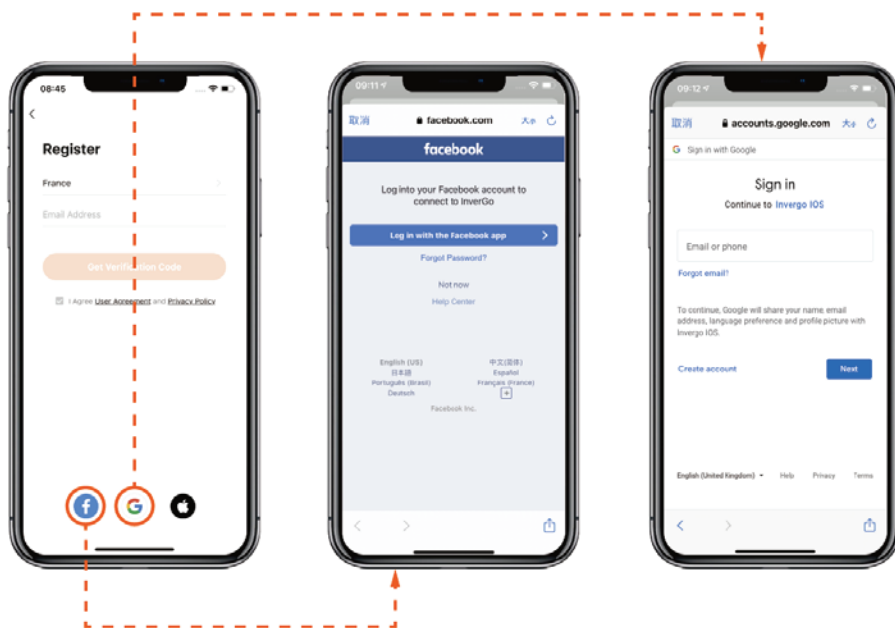
Register by e-mail or third-party application



a. Email registration



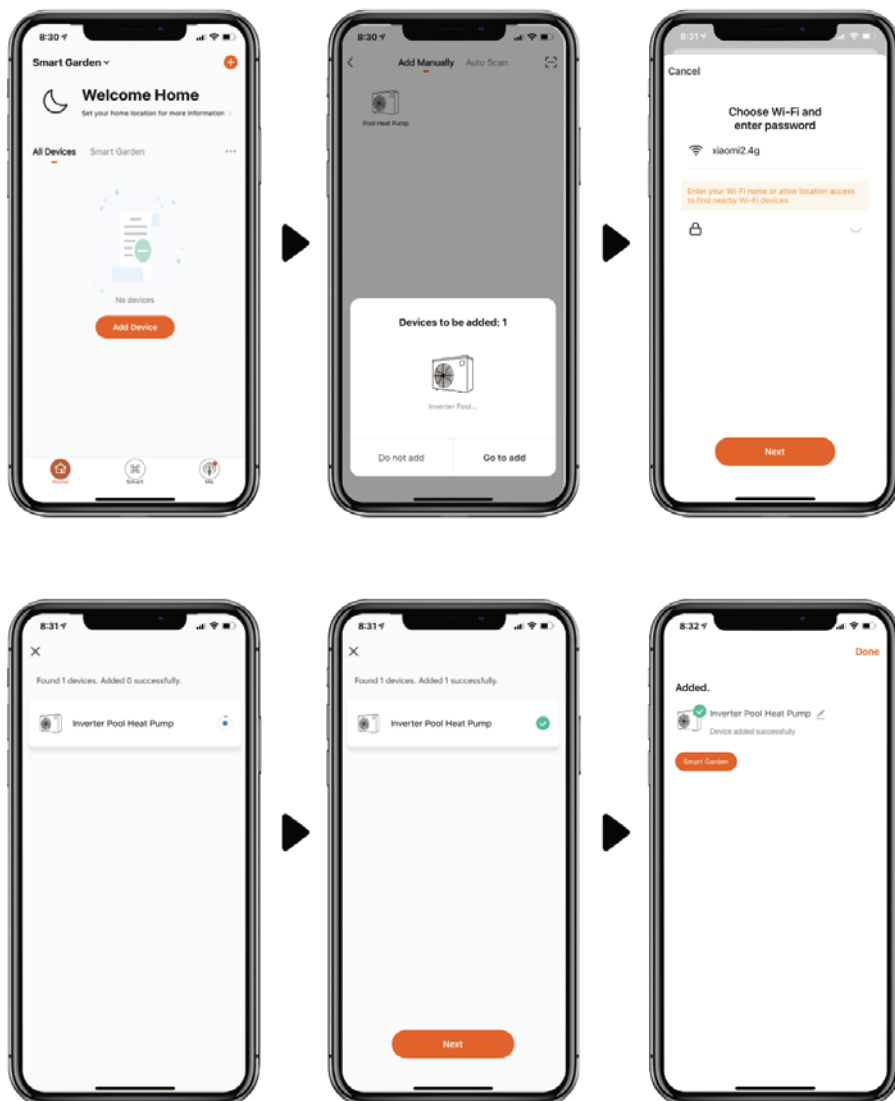
b. Third-party application registration



3 APP Pairing

a. With Bluetooth

1. Please confirm that you're connected to Wi-Fi and your Bluetooth is on.
2. Click "Add Device", and then follow the instructions to pair device.



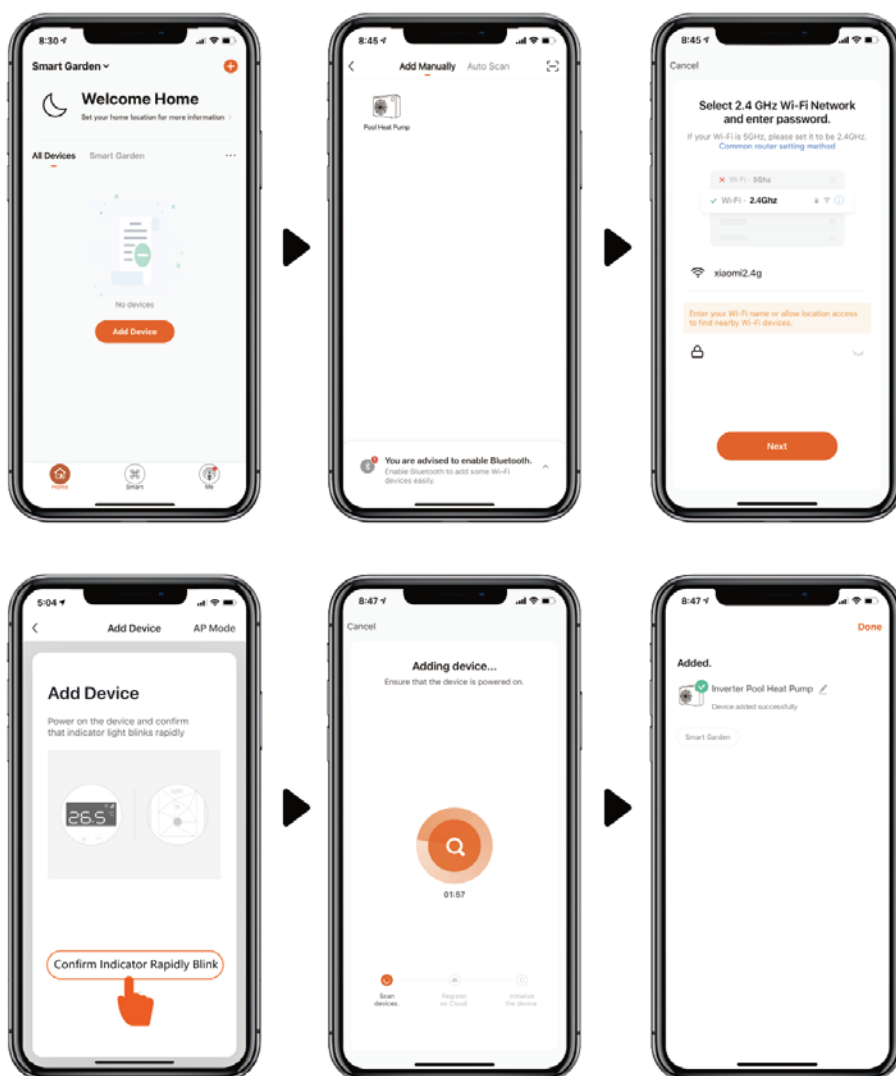
b. With Wi-Fi

1. Please make sure you are connected to Wi-Fi
2. Press Wi-Fi button  for 3 seconds and release to start pairing,  light will flash.

-  Green: Network connected
-  Orange: No network
-  Red: Failure
-  Red (flash): Waiting for connection

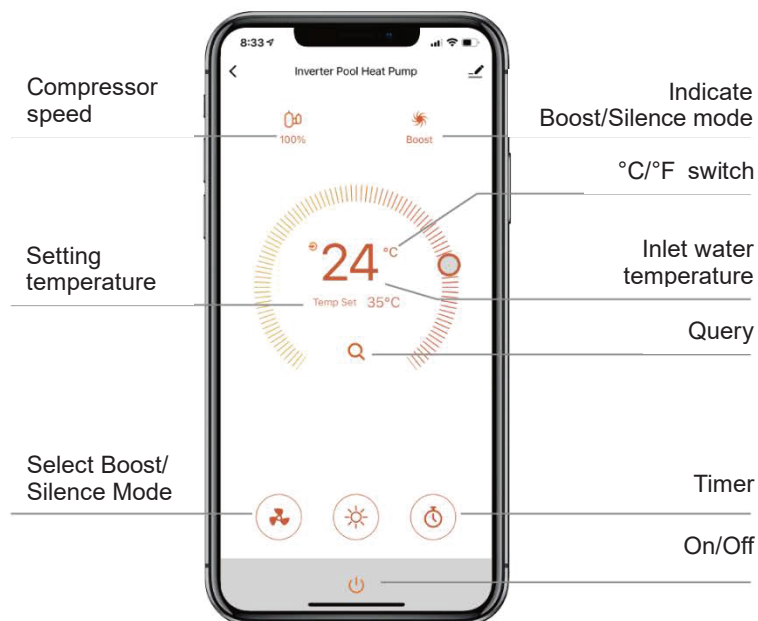


3. Click "Add Device", and then follow the instructions to pair device.

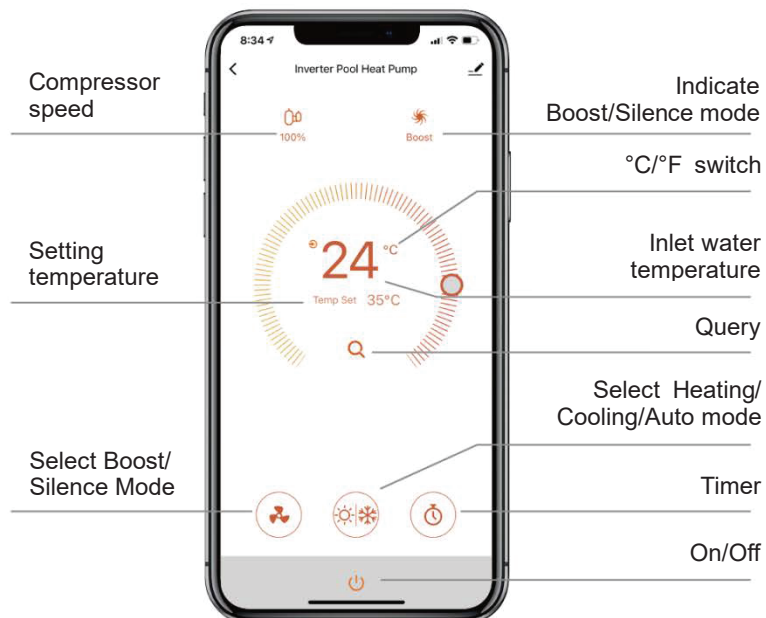


4 Operation

1. For heat pump with Heating function only:

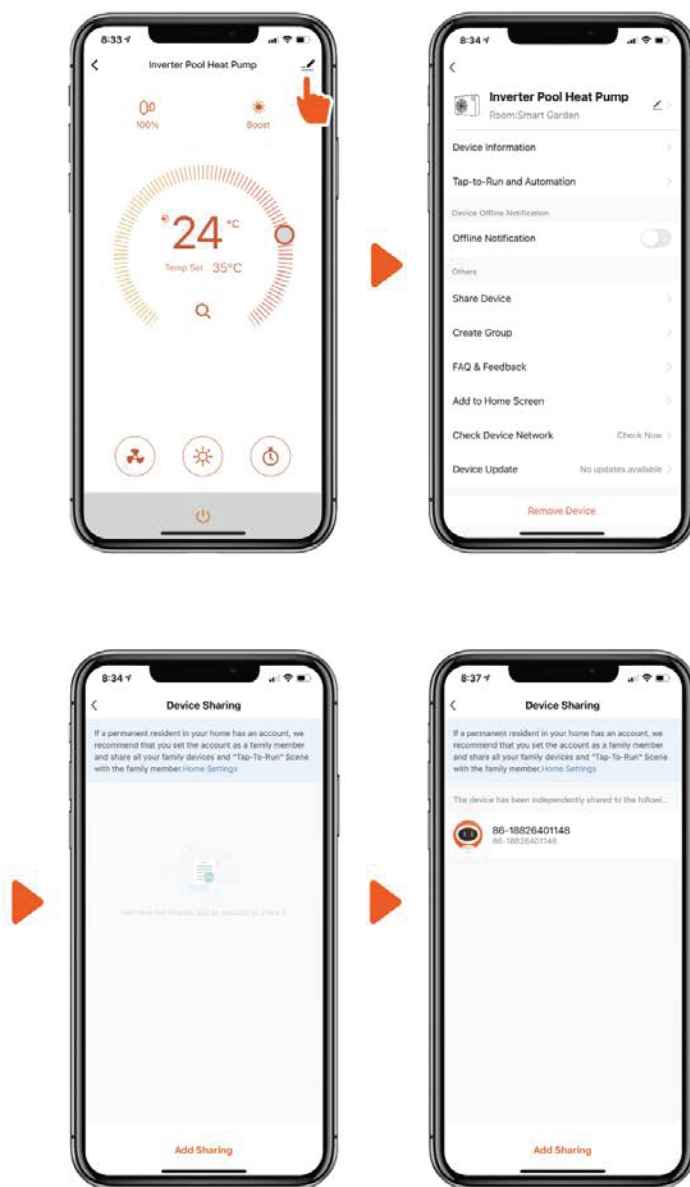


2. For heat pump with Heating & Cooling function:



5 Share Devices to Your Family Members

After pairing, if your family members also want to control the device, please let your family members register "InverGo" first, and then the administrator can operate as below:



Notice:

1. Weather forecast is just for reference.
2. App is subject to updates without notice.

7.1 Inspect heat pump before use

- The ventilating device and outlets are operating adequately and are not obstructed.
- It's prohibited to install refrigeration pipe or components in corrosive environment.
- Inspect the electric wiring on basis of the electric wiring diagram and earthing connection.
- Double confirm the main machine power switch should be off.
- Inspect the air inlet and outlet.

7.2 Leakage detection notice and method

- Leakage checking is prohibited in closed area.
- The ignition source is prohibited during the leakage inspection. A halide torch (or any other detector using a naked flame) shall not be used.
- 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.
- Vacuumize completely before welding. Welding can only be carried out by professional personnel in service center.
- Please stop using while gas leakage occur, and contact professional personnel in service center.

7.3 Trial

- The user must "Start the Pump before the Machine, and Turn off the Machine before the Pump", or the machine will be damaged.
- Before start the heat pump, please check for any leakage of water; and set suitable temperature in the thermostat, and then switch on power supply.
- 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 off the machine.
- After the swimming pool heat pump start up, please kindly checking for any abnormal noise from the machine.

7.4 Running status checking

- Press " for 10 seconds, enter into "running status checking".
- Meantime, the display alternately shows status code and its corresponding value.
- Checking status code through " .
- Press " can quit "running status checking" mode.

- Running status checking table

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

7.5 Running Parameter Checking

- 1) Press " " and  for 10 seconds, it will enter running status checking.
- 2) During this time, the display will show the parameter symbol "P0" and its corresponding value.
- 3) Change status through   the corresponding value also changes.
- 4) Press " " to quit "Running Status Checking" mode.
- 5) Running status checking table.

7.6 Parameters 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	30min
P3	Defrosting start temp	1.4 °F ~ 32°F	1 °F	19.4 °F
P4	Defrosting running time	1 ~ 12min	1min	12 min
P5	Defrosting quit temp	46.4°F ~ 86°F	1 °F	55.4°F
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

COMMISSIONING

Flow Rates

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

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.

Recommended procedure

1. Open all isolating valves
2. Fully close the by-pass and switch the unit on to max temp.
3. Wait 3-4 minutes until heat pump is at 100% Capacity
4. Check inlet and outlet temperature through on-screen controller (Check "Running status check" in the previous section to obtain C0 and C1 values)
5. Open the by-pass valve to increase temperature differential (The difference between C0 and C1 values)
6. Close the by-pass valve to decrease temperature differential (The difference between C0 and C1 values)
7. Once optimum temperature difference (2-3 C) achieved lock position of by-pass if possible.

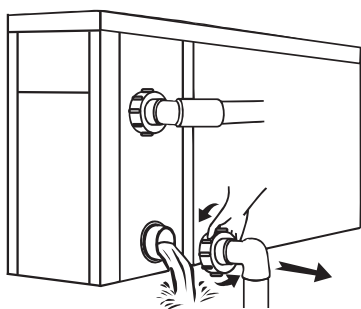
Checklist:

- ☐ Unit has been installed level
- ☐ Minimum ventilation requirements are correct to standards show in appendix K
- ☐ Condensation drain pipe has been connected and drains away from unit
- ☐ Rubber feet have been placed underneath unit
- ☐ Warranty registration details have been filled out in section L
- ☐ Temperature differential has been calibrated between 2-3



“CUT OFF” power supply of the heat pump before cleaning, examination and repairing

1. In winter season when you don't swim:
 - a. Cut off power supply to prevent any machine damage.
 - b. Drain water clear of the machine.



!!Important:

Unscrew the water nozzle of inlet pipe to let the water flow out. When the water in machine freezes in winter season, the titanium heat exchanger may be damaged.

- c. Cover the machine body when not in use.
2. Please clean this machine with household detergents or clean water, NEVER use gasoline, thinners or any similar fuel.
3. Check bolts, cables and connections regularly.
4. If repair or scrap is required, please contact authorized service center nearby.
5. Do not attempt to work on the equipment by yourself. Improper operation may cause danger.
6. In case of risking, safety inspection must be carried before the maintenance or repairing for heat pumps with R410A gas.

WINTERIZATION

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

Warranty Notice

Damage caused by freezing temperatures, residual water left inside the unit, improper drainage, or failure to follow the winterization 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 winterized 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 winterization 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.

RECOMMENDED BREAKER SIZING

MODEL	SKU	MOCp (A) (max overcurrent protection device)	RECOMMEND ED BREAKER (A)	MINIMUM WIRE SIZE (@ Recommended Breaker)
INVERTER HEAT PUMPS				
IEAC320	INVECO320	20	15	12 AWG
IEAC400	INVECO400	20	15	12 AWG
IEAC500	INVECO500	25	25	10 AWG
IEAC660	INVECO660	25	25	10 AWG
ISAC840	INVELITE840	35	25	10 AWG
ISAC1100	INVELITE1100	60	40	8 AWG
ITVC090	INVTIT090	25	25	10 AWG
ITVC112	INVTIT112	65	40	8 AWG
ITVC140	INVTIT140	80	50	6AWG

TROUBLESHOOTING

1. Repairing Guidance



WARNING:

- a. If repair or scrap is required, please contact authorized service center nearby.
- b. Requirements for Service Personnel
- c. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- d. Do not attempt to work on the equipment by yourself. Improper operation may cause danger.
- e. Strictly comply with the manufacturer's requirements when charging R410A gas and equipment maintenance. This chapter focuses on special maintenance requirements for swimming pool heat pump with R410A gas. Please refer to the technical service manual for detailed maintenance operation.
- f. Vacuumize completely before welding. Welding can only be carried out by professional personnel in service center.

2. Failure solution and code

Failure	Reason	Solution
Heat pump doesn't run	No power	Wait until the power recovers
	Power switch is off	Switch on the power
	Fuse burned	Check and change the fuse
	The breaker is off	Check and turn on the breaker
Fan running but with insufficient heating	evaporator blocked	Remove the obstacles
	Air outlet blocked	Remove the obstacles
	3 minutes start delay	Wait patiently
Display normal, but no heating	Set temp. too low	Set proper heating temp.
	3 minutes start delay	Wait patiently
If above solutions don't work, please contact your installer with detailed information and your model number. Don't try to repair it yourself.		

Note: If the following conditions happen, please stop the machine immediately, and cut off the power supply immediately, then contact your dealer:

1. Inaccurate switch action
2. The fuse is frequently broken or leakage circuit breaker jumped.

3. Protection & failure code

NO.	Display	Protection code description
1	E3	No water protection
2	E5	Power supply excesses operation range (not failure)
3	E6	Excessive temp difference between inlet and outlet water(Insufficient water flow protection)
4	Eb	Ambient temperature too high or too low protection (not failure)
5	Ed	Anti-freezing reminder (not failure)
NO.	Display	Failure code description
1	E1	High pressure protection
2	E2	Low pressure protection
3	E4	3 phase sequence protection (three phase only)
4	E7	Water outlet temp too high or too low protection
5	E8	High exhaust temp protection
6	EA	Heat exchanger overheat protection/Evaporator overheat protection (only at cooling mode)
7	P0	Controller communication failure
8	P1	Water inlet temp sensor failure
9	P2	Water outlet temp sensor failure
10	P3	Gas exhaust temp sensor failure
11	P4	Evaporator coil pipe temp sensor failure
12	P5	Gas return temp sensor failure
13	P6	Cooling coil pipe temp sensor failure
14	P7	Ambient temp sensor failure
15	P8	Cooling plate temp. sensor failure
16	P9	Current sensor failure
17	PA	Restart memory failure
18	F1	Compressor driver module failure
19	F2	PFC module failure
20	F3	Compressor start failure
21	F4	Compressor running failure
22	F5	Inverter board over current protection
23	F6	Inverter board overheat protection
24	F7	Current protection
25	F8	Cooling plate overheat protection
26	F9	Fan motor failure
27	Fb	Power filter plate No-power protection
28	FA	PFC module over current protection

Limited Warranty

Standard Conditions: Madimack LLC (USA) 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/us.

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.

Limited Warranty Coverage: Please visit www.madimack.com/us 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).
- **IMPORTANT:** Allow sufficient space around the unit for maintenance and service work. Restricted access may prevent warranty or service work and may result in additional costs.

Procedure for Warranty Claims:

1. Initial Contact: Owners must contact Madimack via the online portal at www.madimack.com/us 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.

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<https://madimack.com/us>

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