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resiSTEAM

Hot Water Installation and Operation Manual

MMESGHW-300 (240V/50HZ/1phase)

REUSABLE ENERGY

CONGRATULATIONS AND THANK YOU FOR PURCHASING OUR PRODUCTS.
THIS MANUAL CONTAINS IMPORTANT INFORMATION THAT WILL HELP YOU IN OPERATING AND MAINTAINING THIS PRODUCT.

PLEASE READ THE MANUAL CAREFULLY BEFORE INSTALLATION & OPERATION AND RETAIN IT FOR FUTURE REFERENCE.

WARNING!
Information provided with this warning mark relates to activities that are definitely forbidden or dangerous. Failure to adhere to the instructions may result in damage to the product or users may risk personal danger or injury.

CAUTION!
Information provided with this warning mark shall be strickly followed during operation. This is for the safety of both users and the product.

Information with this warning relates the important installation requirements ensuring correct operation.

1. IMPORTANT SAFETY INSTRUCTIONS

Please make sure you have read at least one chapter of safety precautions shown in the manual. This part provides quite important safe points for you and please operate it based on safety precautions.

The unit must be installed by a licensed person and in accordance with:

a. AS/NZS 3500.4 – National Plumbing and Drainage Code Hot Water Supply Systems - Acceptable Solutions.
b. AS/NZS 3000 – Wiring Regulations
c. Local authority regulations

- For outdoor installation only;
- Household electricity must have a reliable ground connection; Household electricity must install leakage protection device;
- Do not dismantle any permanent instruction, label or parameter plate attached in the outside cover or all kinds of internal plate of heat pump;

Earthing pole of outlet must have a reliable connection, and rated current value should be not less than 10A.

- Any self-transformation or repair is forbidden, improper repair may cause fire, electric shock, injuries or leakage etc., Contact your dealer or professional personnel for repairs.

Please entrust dealer or professional personnel to install the device; Installer must have professional knowledge, any improper operation by yourself may cause fire, electric shock, injuries or leakage etc.

When you need to remove or re-install the heat pump, please contact your dealer or professional personnel.

- Outlet and power plug must be kept dry to prevent leakage, and make sure outlet and power plug are well matched.
- Installation on a place or wall with water source must have a height of not less than 1.8m or must keep a certain distance.
- One way valve specified by Madimack must be installed near to a cold water outlet;
- Keep out of reach for children.

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2. GENERAL INFORMATION

2.1 SPECIFICATIONS

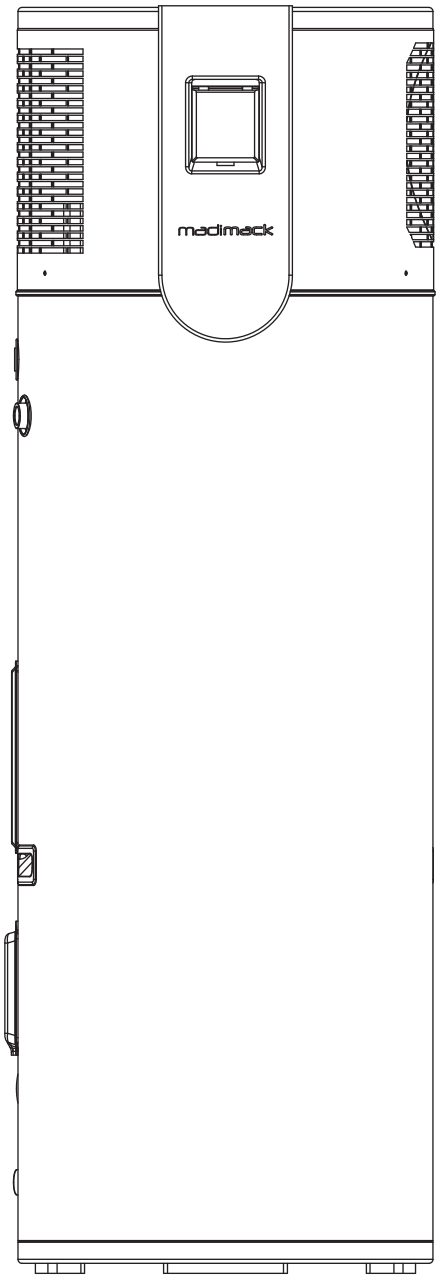
Product		Madimack ResiSteam AIO Hot Water
Model No.		MMESGHW-300
Heating Capacity at Air 20°C /15°C, Water Temperature from 15 °C to 55°C		
Heating Capacity(kW)		2.775
COP		4.183
Max Input Power(W)		2400W
Max Input Current(A)		10A
Power Supply		220-240v/50Hz
Heat Pump	Rated Power(W)	664
	Rated Current(A)	3
Electric Heater	Rated Power(W)	2000
	Rated Current(A)	9
Refrigerant		R290/420g
Net Dimension(mm)		Ø620X1890
Compressor		GMCC
Package Dimension(mm)		700X700X2040
Net Weight(Kg)		130
Gross Weight(Kg)		142
Noise(dB)		48
Water Tank volume(L)		300
Working Temperature range(0C)		-7~43
Testing COndition: *Heating Capacity at Air temp. 200C/150C, Water Temperature from 150C to 550C		

2.2 FEATURES

All in one heat pump for sanitary hot water:

1. Has complete isolation between water and electricity. Without electric shock problem, more safety.
2. No fuel tubes and storage. No potential danger from oil leakage, fire, explosion, and so on.
3. No potential cross contamination as the condenser coil is wrapped around the highly anti-corrosive enamel interior tank. The external coil does not come in contact with water directly.
4. The outlet water temperature is over 50°C. The system makes the water heating process stable and quick with innovative heating methods of combining the electric heating and heat pump heating properly.
5. Automatic start-up and shutdown. Automatic defrosting by recycling refrigerants to save extra operation.
6. According to the heat pump principle, the unit absorbs heat from outside and produce heat, with water thermal efficiency which can be approximately 4.18 (Under the condition A20/15°C and W15/55°C).
7. Within the temperature range of between -7°C to 43°C, the unit will still be effective even in the night, cloudy skies, rain and even snowy weather.

2.3 EXTERNAL APPEARANCE



2.4 REFRIGERANT CIRCUIT

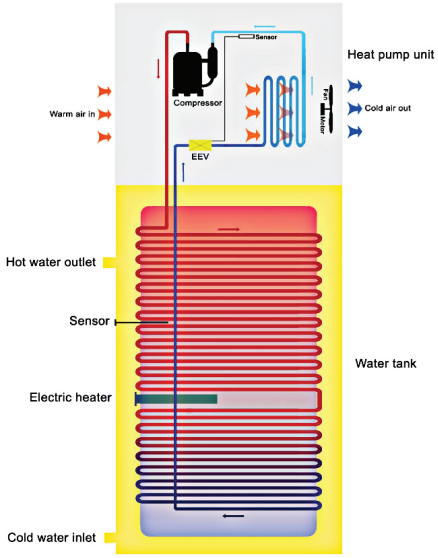
Compressor:
R290, supplied by GMCC.

Evaporator:
Copper tube and aluminum fin type heat exchanger.

EEV:
Electronic expansion valve, the opening is regulated according to the discharge air temperature of compressor.

Fan:
Centrifugal fan with three speeds.

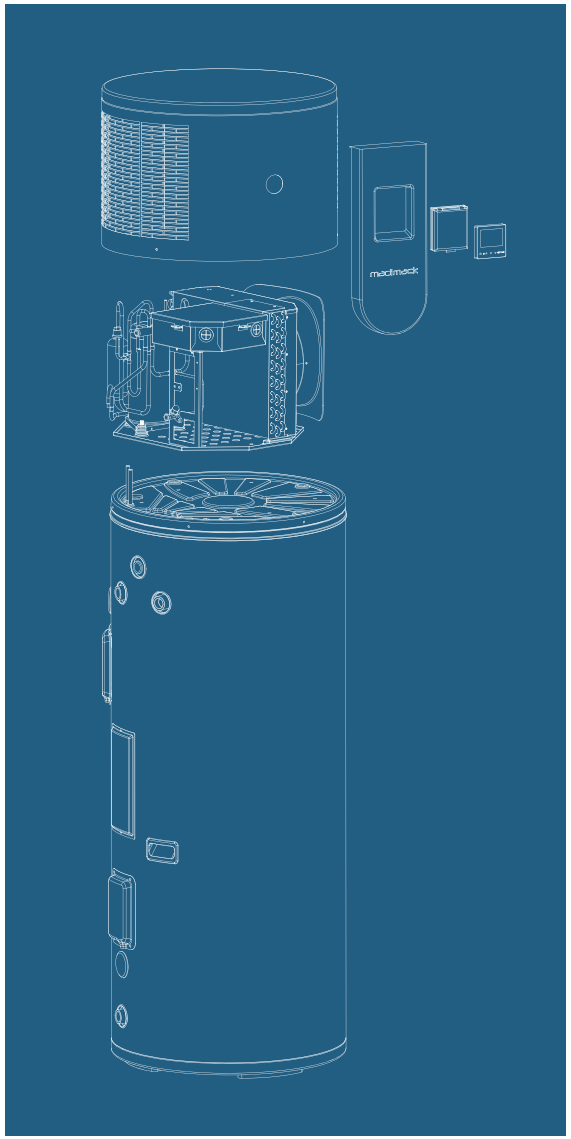
High Pressure Switch:
When the discharge pressure of compressor is 3.0 Mpa or higher, the protection switch will be triggered, and if the discharge pressure is down to 2.07MPa, the protection switch will be recovered.



3. PARTS NAME and COMPONENTS

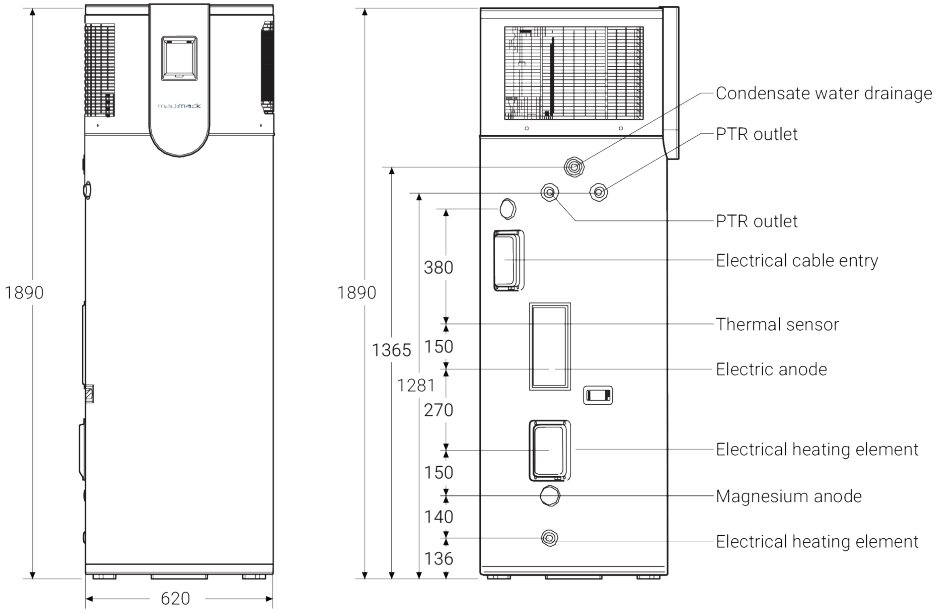
3.1 EXPLODED VIEW

All the pictures in this manual are for explanation purpose only.
It may be slightly different from the heat pump water heater you purchased (depend on the model).
Please refer to the real sample instead of the pictures of this manual.



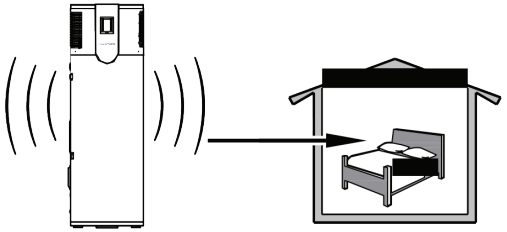
1	Cold water inlet
2	Magnesium anode
3	Electrical heating element
4	Electronic anode
5	Temperature sensor
6	Electric cable entry
7	Hot water outlet
8	PTR outlet
9	Condensate water drain
10	Compressor
11	Electronic control box
12	Evaporator
13	Fan assembly
14	Upper cover
15	Top cover
16	Fascia
17	Controller box
18	Controller

3.2 ORTHOGRAPHIC VIEW



4. INSTALLATION

1. Do not install the unit indoor as it uses R290 refrigerant which is flammable.
2. The place of installation must have enough space for installing and maintaining the pump.
3. Ensure that there is adequate ventilation around the water heater, do not install in an enclose space.
4. Install the heater on a flat solid surface. (horizontal angle must not be more than 2°), and can bear the heat pump's weight.
5. Be sure that the noise and the exhaust air flow complies with the relevant regulations.
6. Ensure installation location is free of any combustible materials or chemicals which may cause corrosion.
7. Heat pump must be electrically grounded and electrical circuit must confrorm to local and national standards.
8. Ensure there are no electromagnetic fields which may effect the controls of electronics.



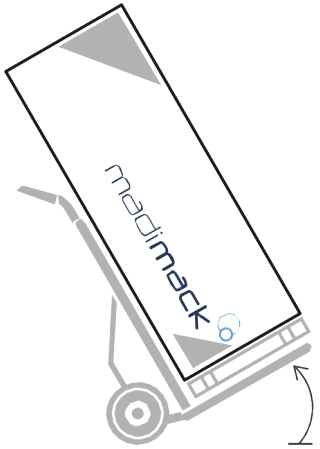
Noise level is 48dB.
Do not install in locations which may impact neighbours or near bedroom windows.

4.2 TRANSPORTATION

1. During transportation or storage, the heat pump water heater shall be packed in the undamaged package to avoid damage to appearance and performance of the product.

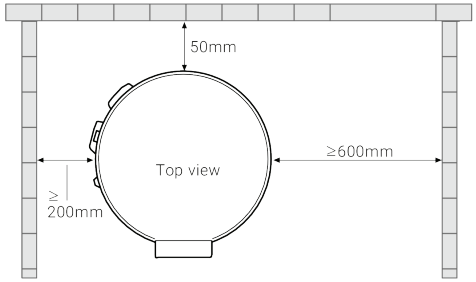
2. The heat pump should only be transported in an upright position.

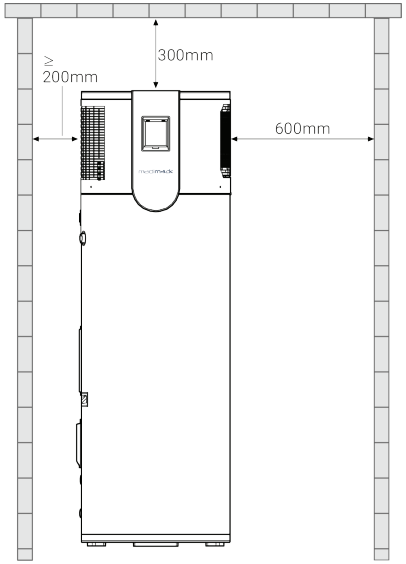
3. Under certain conditions, this product may be laid down for a short time/distance as per indication on the side of the package. The heat pump water heater, after being laid down, should be kept in an upright position for more than 4 hours before starting up.



Do not tilt beyond 30 degrees.

4.3 INSTALLATION DIMENSIONS

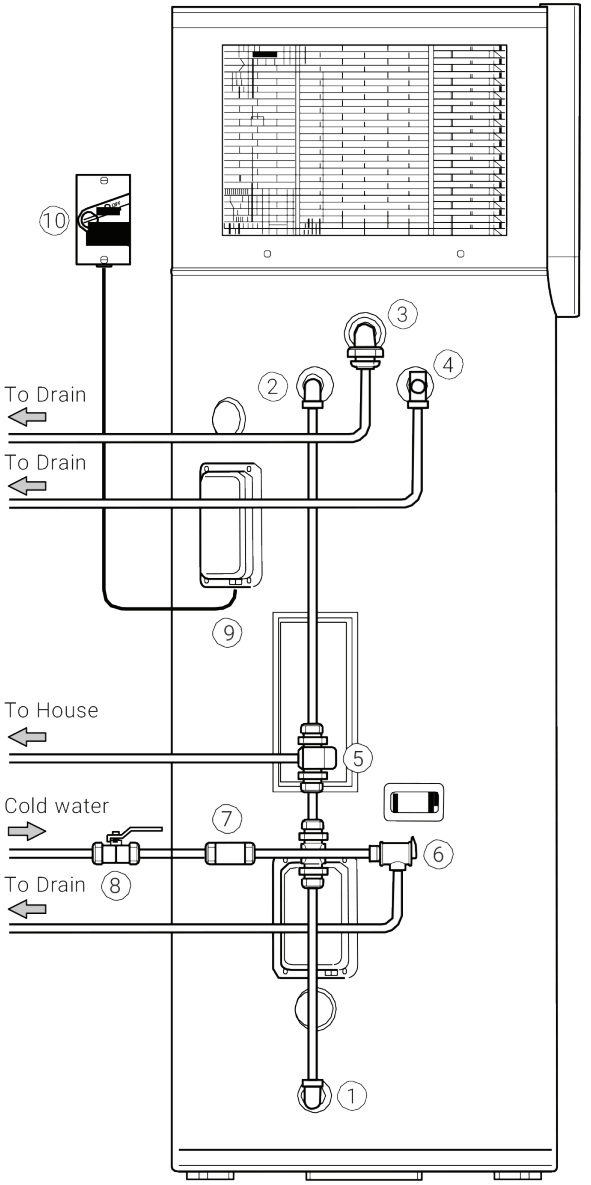




The system is designed for external use only with a minimum 20metre of unobstructed space sorrounding the unit.

5. PIPE LINE CONNECTION

5.1 PIPE LINE INSTALLATION DIAGRAM



5.2 PIPING MATERIALS

1. Cold water supply inlet (G3/4" female thread).
2. Hot water supply outlet (G3/4" female thread).
3. Condensate drain (*)
4. P & T Relief valve (*) (G1/2" female) (85kPa)
5. Tempering valve (High performance recommended)
6. Expansion control valve (ECV) (If required by council 700kPa) (Not supplied)
7. Pressure reduction valve (500kPa)
8. Non-return/ Isolation valve
9. Electrical cable
10. Isolation switch (Hard wired into 10 amp circuit)

(*) Supplied with the system.

5.3 WATER PIPE LINE INSTALLATION INSTRUCTIONS

1. All hot water pipework should be insulated with sealed Polyethylene foamed or equivalent insulation to optimize performance and energy efficiency. Such insulation may also be mandatory under local regulations. Water pipe sizing should be performed in accordance with AS/NZS 3500.
2. All hot water parts should be cooper, if using pipe of other material please refer to local authorities for further instructions.
3. All pipework must be insulated with a minimum 13mm closed cell insulation;
4. Water inlet/outlet size is G3/4'', female thread.
5. The water pipe's work life should not less than heat pump's work life.
6. Relief valve is G1/2'', 850 kPa, after installation, must sure that the drainage pipe which connect with the relief valve, is not blocked.
7. After finished all pipeline, open up the valve controlled cold water inlet and the valve controlled hot water outlet to fill water into tank, you can stop when you find water overflows from water outlet, then inspect all pipeline and make sure have no water leakage.
8. Water inlet pressure should be above 150kPa, if system pressure is lower than 150kPa please refer to "boosted water systems" and install booster where neccesary.

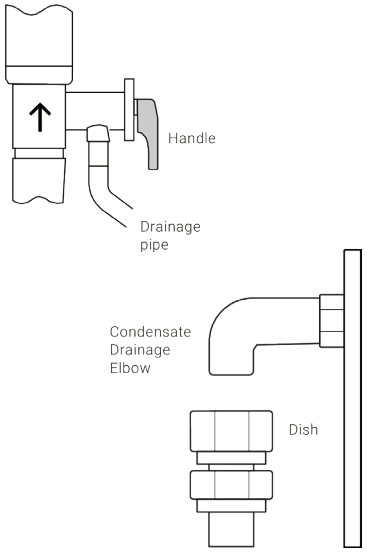
- Do not hold down the handle of safety valve;
- Do not knock down safety valve;
- Do not plug the drainage port;
- Excretion pipe must be connected with an open drainage port.
- Do not hold down the handle of safety valve;
- Do not knock down safety valve;
- Do not plug the drainage port;
- Excretion pipe must be connected with an open drainage port.

In a places where ambient temperatures are likely to drop below 0ºC, ensure that adequate freeze protection is provided.

5.4 PLUMBING CONNECTION

Hot water heaters can produce hot water above scalding temperatures. Please refer to local regulations requiring the reduction of temperature into a property with the installation of a tempering valve. The valve should be checked regularly to ensure operation.

This water heater is not intended for use by young children, inferms persons, or persons lacking relevant skills or experience without suitable supervision. The water temperature over 50°C can cause severe burns instantly or death from scalds. Children, disabled and elderly are at highest risk of being scalded. Feel water before bathing or showering. A tempering valve is required as per AS 3500. Test water before bathing.



1. Condensate Drain

Fit the condensation tube to the connection on left hand side of the unit and run to suitable location.

2. Pressure & Temperature Relief (PTR) Valve

This Valve is located near the top of the water heater and is essential for safe operation. It is normal for the valve to release a small quantity of water through the drain line during heating. However, continuous leakage of water from the valve and its drain line may indicate a problem with the water heater.

> **Warning!**
> Never block the outlet of PTR valve or it's drain line for any reason. The lift level must be operated at least every 6 months to remove lime deposits and verify that it is not blocked. Failure to do this may result in the water heater failing.If the valve does not discharge water when the lift lever is opened, or does not seal again when the lift lever is closed, attendance by an authorized person must be arranged without delay. The PTR valve is not serviceable.

3. Expansion Control Valve (ECV)

Some local regulations require the installation of an ECV. An ECV is usually fitted to the cold inlet line of the heater and will discharge any expanded water through the heating process. If the valve leaks continuously, try easing the valve for a few seconds. This may dislodge any foreign matter and alleviate the problem. Operate the easing gear regularly to remove any lime deposits and to verify that it is not blocked. The ECV should be 700kPa.

4. Pressure Reduction Valve

If the inlet water pressure is greater 500kPa, a pressure reduction valve must be installed to connect with inlet water pipe for purpose of keeping your water tank into a long-term working state.

5. Non-return/Isolating Valve

It is mandatory to be install a non-return valve is installed directly into the coldwater supply line feeding the system. This will allow the hot water system to be isolated from the rest of the homes water supply, making servicing, draining and replacing the unit easy.

6. ELECTRICAL CONNECTION

- For safe performance, this water heater is fitted with a thermostat and an over temperature cut-out. These devices should not be tampered with or removed.
- Power supply circuit must be fitted with ground wire, and ground wire of power supply must be reliably connected to an external ground wire.
- The operation must be worked by professional personnel based on circuit diagram.
- Set up the leakage protection device well according to the National Technical Standard for electrical equipment.

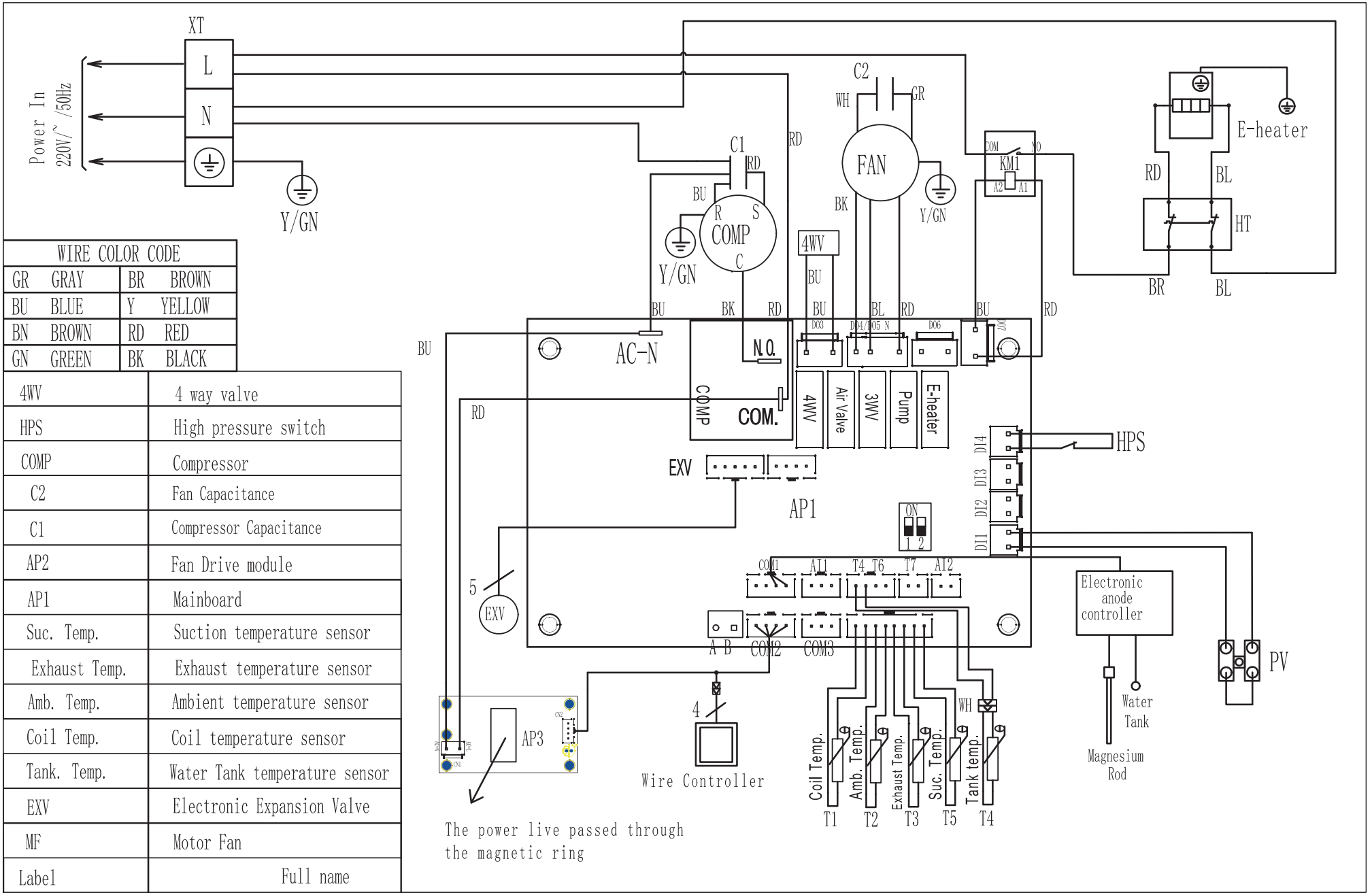
6.1 POWER SPECIFICATION

Remarks: Please directly connect power supply wire with user's plug when use the heat pump. The electric work must comply with the local supply authority regulations as well as AS/NZS 3000. The power rating of the unit is set at 10 amps as such the main power supplying the unit must have a 10 amps minimum circuit breaker fitted. The unit is fitted with an overtemperature control cut-out. Under no circumstances must the water heater be in operation without this safety device connected to the circuit. Re-setting and replacement of this unit must only be carried out by a qualfied electrical contractor.

6.2 POWER CONNECTIONS

The unit is supplied with a 3-pin, 10A plug. The heater should be wired into a terminal with the ability to isolate the heater from the power source. Any works carried out to the electrical plug and circuit should only be carried out by an authorised electrician.

6.3 ELECTRICAL WIRING DIAGRAM



WIRE COLOR CODE			
GR	GRAY	BR	BROWN
BU	BLUE	Y	YELLOW
BN	BROWN	RD	RED
GN	GREEN	BK	BLACK

4WV	4 way valve
HPS	High pressure switch
COMP	Compressor
C2	Fan Capacitance
C1	Compressor Capacitance
AP2	Fan Drive module
AP1	Mainboard
Suc. Temp.	Suction temperature sensor
Exhaust Temp.	Exhaust temperature sensor
Amb. Temp.	Ambient temperature sensor
Coil Temp.	Coil temperature sensor
Tank. Temp.	Water Tank temperature sensor
EXV	Electronic Expansion Valve
MF	Motor Fan
Label	Full name

7. INSTALLATION CHECKLIST

Heat pump is installed to ventilation requirements:

1. Pipes are rigid and free of leaks
2. Piping has been insulated.
3. Electrics have been made safe.
4. Power voltage is equivalent to the the rated voltage.
5. No combusible materials are in the area.
6. Expansion valve and TPRV have been checked.
7. Earth leakage protection device works well.

Operations without water in the tank may result in damage of the heat pump or auxilary heater. Such damage is not covered by warranty.

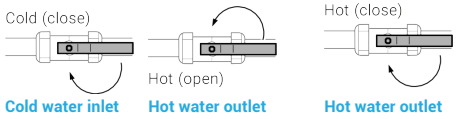
8. SWITCHING THE UNIT ON

8.1 Filling the tank

1. When using the heater for the first time ensure the tank is full of water before operating.
Follow the below steps.

a. Open the cold feed to the inlet of the water tank.

b. Open a hot water tap until all air has been removed and water is flowing freely from the tap.



c. Check tank is full by opening the TPRV valve lifter and check water is discharged.

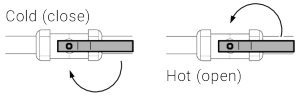
8.2 Powering up

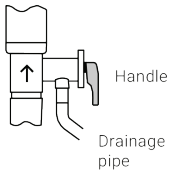
Switch isolator to on and front panel will illuminate ready for heating and setting any other settings

Water temperature over 50°C can cause severe burns instantly or death from scalds. Children, disabled and elderly are at highest risk of being scalded. Feel water before bathing or showering. Water temperature limiting valves are required as per AS 3500.

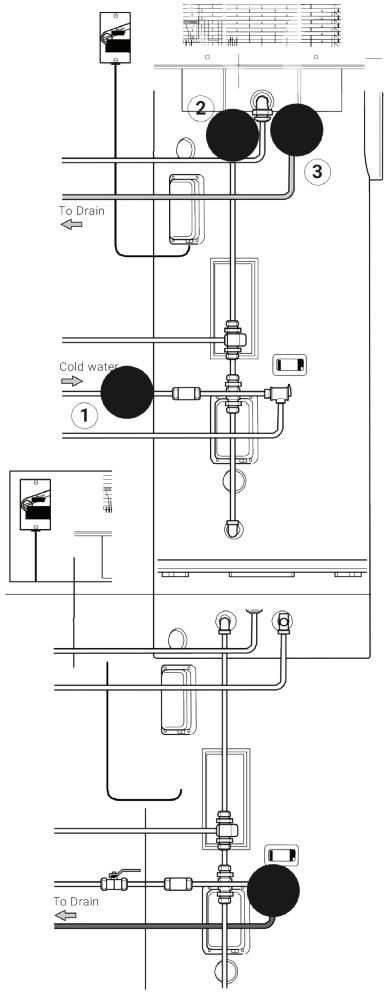
8.3 Water draining:

Before cleaning or moving the unit, please drain out the water in the water heater. The draining method as below picture:





After draining, tighten the nut of the drainage outlet. **Do not overtighten** Drainage outlet



9. OPERATION

9.1 DISPLAY CONTROLLERS

- On the initial powering on, the controller display is off.
- The "Water Temp" and "Set Temp" will displays the actual temperature.
- The "Water Temp" "Set Temp" then displays "0".
- Turn the power ON again, keep the unit in ON/OFF state, no operation for 60 seconds.
  - The screen flashes and displays the current "Water Temp", Touch the screen again it and it will lights up automatically and switches on the main interface.
- Press the mechanical button at the top of the controller to break/light the screen.

9.2 CONTROLS

No.	Button	Symbol	Description
1	POWER ON/OFF		Press to power ON/OFF. When pressed ON the "MODE" lights up, Power Off the "MODE" lights out.
2	MODE		Press the Mode symbol will switch the working mode in a loop: STAN、AUTO、ELEMENT、SOLA.
3	QUERY		Press to enter the Query page; Press to enter the page; User can check the temperature, system status, fault info, controller information. 
4	SET		Press to enter the settings page; Press to enter the page; Press "Return" to return to main page 

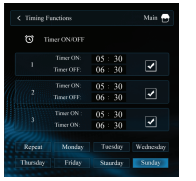
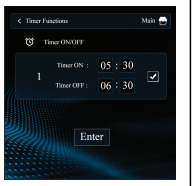
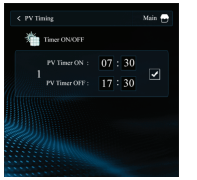
9.3 MODE menu

No.	Button	Symbol	Description
5	Set Temp		1. Press to enter the temp setting page; 2. Press "**+**" 、 "**-**"to set the temperature (Unable to set in AUTO mode). 3. Press "**Enter**" to confirm and exit; 4. Press "Esc" to cancel and exit 
6	Time calibration		1. Press to enter the time calibration page; 2. Set the date and time; 3. Press "Return" to return to Setting page. 

9.4 QUERY PAGE

No.	Button	Symbol	Description
1	Temperature		1. Press to enter the User Parameters page; 2. Press "Return" to the previous page; 3. Water temperature and temperature difference valve can be set on this page.
2	System Parameters		1. Press to enter the system status page; 2. Press "Return" to the previous page 3. Press "Next" to the next page, Press "Prev" to the previous page.
3	Notification information		1. Press to enter fault info page; 2. Press "Return" to previous page; 3. Press "Clear " to clear records. 
4	Power Statistics		1. Press to enter Power Stastics page; 2. Press "Return" to previous page.

9.5 Functions and settings

No.	Button	Symbol	Description
1	User commands		1. Press to enter the User Para page; 2. Press "Return" to previous page; 3. Press "Germicidal mode" to sterilize; 4. Press "Forced frosting" to defrost; 5. Press "Quick heat mode" to turn on/off electric heater.(Not activated in AUTO mode.)
2	Timing functions		1. Press to enter timing page; 2. Press to set the timer; 3. Press "Return" to previous page; 4. Press "Cancel" to cancel and exit;  
3	WIFI distribution		1. Press to enter Wifi config page; 2. "Intelligent" and "AP" two kinds WIFI connection mode; 3. Press any one mode can enter to configuring page; 4. Refer to the guild on the app on mobile phone. 
4	Factory functions		1. Press to enter the Password page; 2. Input password, press "Enter" to enter the parameter page; 3. Press "Next" to next page, 4. Press "Prev" to previous page; 5. Press "Cancel" to cancel and exit; 6. Press "Return" to return previous page. *This page only for authorised Installers.
5	PV timing		1. Press to enter timing page; 2. Press to set the PV timer; 3. Press "Return" to previous page; 4. Press "Cancel" to cancel and exit;  
6	Display		1. Press to enter the brightness page; 2. Drag the brightness bar to change the brightness of the screen. 3. Press "Return" to previous page 

9.6 CONTROL FUNCTIONS

9.6.1 Water temperature control

Water temperature control

The controller can control the water temperature when it is on. In stand mode, the controller controls the water temperature according to the setting temperature and hysteresis; In auto mode, the controller controls the water temperature according to the ambient temperature.

Heating mode

When it is heating, in stand mode, the water temperature(Th) is the setting temperature(F01, default value 60℃); In auto mode, the water temperature(Th) is adjustable according to the ambient temperature, as below:

Ambient temp(℃)	$T_a \leq 15$	$15 < T_a \leq 20$	$20 < T_a \leq 25$	$25 < T_a \leq 30$	$30 < T_a \leq 35$	$35 < T_a \leq 38$	$T_a \geq 38$
T_h(℃)	55+F05	53+F05	50+F05	48+F05	46+F05	44+F05	42+F05

When tank temp ≤ heating setting temp(Th)- Water temp control hysteresis (F03, default 5ºC), the nit start heating;

When tank temp ≥ heating setting temp(Th), the unit stop heating;

When heating setting temp(Th)≥ highest temp(F08, default 60ºC), the unit force to turn on the electric heater to continue heating until the water temp reach to the heating setting temp(Th). (The electric heater is not restricted by the ambient temperature).

When heating, if When heating setting temp(Th)≥ highest temp (F08, default 60ºC), when the tank temp ≥ highest temp (F08, default 60ºC), force to stop heating, when tan temp ≤ highest temp(F08, default 60ºC)- water temp control hysteresis (F03ºC default 5ºC), allow to heat again.

When ambient temp ≤ low ambient temp protection(F09)-2ºC, it enters low ambient temp protection and prohibits compressor to work, when the ambient temp ≥ low ambient temp protection(F09), it releases the low ambient temp protection and allows the compressor to work.

When shutdown, high/low pressure protection, low ambient temp protection, high exhaust temp protection, the unit suspends heating/cooling by the compressor; When inlet water temp sensor failure, ambient temp sensor failure, the unit suspends heating/cooling. The compressor is allowed to work 60 seconds after the unit is first powered on, the compressor can restart only after the compressor protection time, 3 mins after the compressor shutdown.

9.6.2 Defrosting

The controller automatically starts defrosting only when the compressor is used for heating.
Electric heating turns on during defrosting.
Start defrosting: Compressor shutdown, fan shutdown, after 20 seconds, the four-way valve open, after 30 seconds, defrosting starts;

Finish defrosting: Compressor shutdown, after 30 seconds, the evaporator and fan start, after 30 seconds, the four-way valve close, after 30 seconds, the unit can work.
If the unit is in the following state: shutdown、standby、high pressure protection、exhaust temperature too high、tank temperature sensor failure、ambient temperature sensor failure, it stops defrosting. If evaporator coil temperature sensor failure, the on/off of defrosting is not limited by the corresponding temperature.

9.6.3 Four-way Valve

The four-way valve is disconnected when the unit is heating, the four-way valve works as the defrosting program

9.6.4 Fan

When power on, the fan works 5 seconds before the compressor works, when power off, the fan stops 10 seconds after the compressor stops; When defrosting, the fan stops

9.6.5 Electronic expansion valve

(Manufacturer's confidential information)

9.6.6 Electric heater

When defrosting, the electric heater is turned on; When cooling, the electric heater is not allowed to turn on. The electric heater is not allowed to turn on in 60 seconds when the unit is power on.

When the heating setting temp (Th)>water tan temp≥ highest temp (F08, default 60ºC), the electric heater is turned on to heat the water to the heating setting temp(Th). (the electric heater is not limited by ambient temp)
The automatic fast heating function (F13=0, enabled): when heating, water tank temp < automatic speed fast hot water temp (F14, default 40ºC), the electric heater is turned on, and the "electric heater" symbol lights on; when the water tank temp reaches the automatic speed fast hot water temp, the electric heater is turned off, and the "electric heater" symbol lights off, automatic fast heating function is not limited by ambient temp.

When the ambient temp is too low, the electric heater is enabled automatically, specific for: when the ambient temp ≤ the low ambient temp of automatically activate electric auxiliary (F10, default 5), the electric heater is turned on automatically; when the ambient temp ≥ the low ambient temp of automatically activate electric auxiliary(F10)+2, electric heater is turned off. When the water tank temperature meets the heating conditions, but the unit is locked in high/low pressure, low ambient temp protection, high exhaust temp protection, exhaust temp sensor failure, coils temp sensor failure, absorber temp sensor failure, the electric heater is not limited by ambient temperature.

In manual mode, the electric heater is controlled by the heating setting temp(F01) and water temp control hysteresis(F03);
In auto mode, the electric is controlled by the conditions as below.

Notes: Manual fast heating is not limited by the ambient temperature

Ambient temperature(℃)	$T_a \leq 15$	$15 < T_a \leq 20$	$20 < T_a \leq 25$	$25 < T_a \leq 30$	$30 < T_a \leq 35$	$35 < T_a \leq 38$	$T_a \geq 38$
T_h(℃)	55+F05	53+ F 05	50+ F 05	48+ F 05	46+ F 05	44+ F 05	42+ F 05

9.6.7 Auto disinfection

Works when F66=1, the auto disinfection is enabled,

Auto disinfection

If set temperature ＜70℃, the accumulated running time reaches 7 days, enter auto disinfection mode;
It will rest the timer after auto disinfection mode finishes.
When ambient temperature≥20℃, it starts disinfection at 1：00.
When ambient temperature＜20℃, it starts disinfection at 15:00; Auto disinfection starts, the electric heater heats the water to 70℃, and keep it between 65～70℃ for 30 minutes then exit auto disinfection mode.
If set temperature ≥70℃, the auto disinfection function is disable)

9.6.8 Temperature compensation

Temperature compensation

1. When F61=0， the units selects temperature compensation according to ambient temperature and tank temperature automatically；

Temperature compensation = 0.1*（Ta-20℃）+0.1*（Tw-30℃).
Note：When ambient temperature is below 20℃， ambient temperature compensation is not calculated；Then water tank temperature is below 30℃， water tank temperature compensation is not calculated, and the highest compensation is no more than 5℃.

2. When F61=1， Cancel"Temperature compensation"function.

Controlled and display temperature
Actual temperature + Temperature calibration value (F11)
Actual temperature + Temperature calibration value (F11)
Actual temperature + Temperature calibration value (F11)
Actual temperature + Temperature calibration value (F11)
Actual temperature + Temperature calibration value (F11)
Actual temperature + Temperature calibration value (F11)

9.6.9 Smart Grid

Switch set temperature and water temperature control hysteresis automatically according to the linkage switch.
Out of PV timer range:
Normal power:
Linkage switch is off(F48=0); City power
Heating setting temperature =50℃ (F01: 15℃--60℃; default 50ºC).
Water temperature control hysteresis =7℃; (F03: 1℃--15℃; default 7℃) Means the heat pump works when the water temperature drops to 43℃ until it reaches 50℃.

PV power
Linkage switch is off(F48=1); PV supply power
PV heating setting temperature=60℃ (F28: 15℃--60℃; default 60 ℃)
Water temperature control hysteresis =3℃ (F29: 1℃--15℃; default 3 ℃)
Means the heat pump works when the water temperature drops to 57℃ until it reaches 60℃;

During PV timer range:
No matter linkage switch is on/off, the PV setting temperature and control hysteresis are enabled.

PV timer (default)	Linkage Switch	Setting temperature	control hysteresis
11am-3pm	Off	Temp. for PV	Diff. for PV
	On	Temp. for PV	Diff. for PV
3pm-11am	Off	Set. Temp	Diff. Value
	On	Temp. for PV	Diff. for PV

9.7 Failure warning

9.7.1 Low pressure failure

When the compressor works 5 mins later(F43), if the low-pressure switch is detected disconnected for 10 consecutive seconds(F40), the compressor stops immediately, the controller displays the low pressure failure error code "E04"; After the low-pressure switch restores, if the low-pressure protection is not locked, then it will remove the low- pressure protection, if there is no other protection or lock, then the compressor will restart after 3 minutes If there are 3 times (F41) low pressure failure protection within 1 hour (F42), the controller will be locked, the compressor is locked in shutdown protection, the lock can only be unlocked by restart the unit; The low-pressure is not detected when defrosting.

9.7.2 High pressure failure

After the compressor works, if the high-pressure switch is detected disconnected for 10 consecutive seconds(F44), the compressor stops immediately, the controller displays the low-pressure failure error code "E03"; After the high-pressure switch restores, if the high-pressure protection is not locked, then it will remove the high-pressure protection, if there is no other protection or lock, then the compressor will restart after 3 minutes.
If there are 3 times (F46) high pressure failure protection within 1 hour (F42), the controller will be locked, the compressor is locked in shutdown protection, the lock can only be unlocked by restart the unit.

9.7.3 High exhaust temperature failure

When it detects the exhaust temperature is above or equal to the high exhaust temperature protection value (F60, default 100ºC)+10ºC,the high exhaust temperature alarms and the compressor stops heating, the controller displays the high exhaust temperature failure error code "E02"; The exhaust temperature drop back to the high exhaust temperature protection value(F60)- 10ºC, it will detective alarm and restore the temperature control function. If there are 3 times (F46) High exhaust temperature failure protection within half an hour, the controller will be locked, the compressor is locked in shutdown protection, the lock can only be unlocked by restart the unit.

9.7.4 Low ambient temperature protection

Then the ambient is ≤-9ºC(F09-2ºC), the unit is not allowed to work; when the ambient is ≥-7ºC (F09), the unit can work; There is no failure symbol to show low ambient temperature protection.

9.7.5 Sensor failure

If tank、ambient sensor failure, then the unit shutdown;
If absorber、exhaust、coil sensor failure, then the electric heat is allowed to work; If tank、ambient sensor failure, then electric heater is not allowed to work.

9.7.6 Error code

Code	Error name
E02	Exhaust temperature too high.
E03	High-pressure switch failure (Switch ON/OFF protection)
E04	Low-pressure switch failure (Switch ON/OFF protection)
E09	Communication failure (The controller cannot receive data from PCB)
E11	Evaporator coil temperature sensor failure.
E12	Ambient temperature sensor failure.
E13	Exhaust temperature sensor failure.
E15	Tank temperature sensor failure（F64=1 enabled）
E17	Absorb temperature sensor failure.

10. MAINTENANCE and SOLUTION

10.1 Maintenance

1. Frequently check power plug and sockets and make sure both of them have been connected well and reliably, and have no over-heating effect.
2. When not used for a long time, especially where temperature is below 0ºC water filled in the water tank must be drained out to prevent from damaging inner tank; (operation shown the above contents).
3. To make heat pump to keep a long-term and high efficiency working state, we suggest you should clean inner tank up every half a year to remove accumulated sediment, please obey the following rules to clean innertank.

   (1). Turn off power supply of heat pump;

   (2). Turn off cold water inlet valve, and open up hot water tap water;

   (1) Connect drainage water with drain outlet through a soft pipe;(temperature resist of drainage pip is less than 93ºC if drainage pipe does not meet demands, please turn on cold water inlet valve, and turn on hot water tap water until water is not hot). Turn on drainage water port of heat pump, clean water tank attached to inner tank up, if needed, you will wash inner tank for many times to clear sediment.
4. Turn off drainage water port, re-fill water into inner tank and recover powersupply.
5. Each device has been matched with one anode rod, and anode rod will be slowly consumed during the process of protecting inner tank and extending use life. Under some water circumstance, anode rod and water can rise reaction, hot water will be quickly corroded and rise leakage when anode rod has been used up. We suggest check insulation materials every one year, if anode rod is used up, you can inquiry local server center or specific technical department to change a new one.
6. Used for enough hot water where we suggest user turn down set temperature, which can reduce heat loss and avoid incrustation, meanwhile this work can help you save more electric energy and extend use life.
7. Filter should be cleaned up every one month to make sure heating effect. If used for those regions which the temperature is below 0ºC, you can take suitable measures to protect pipes and keeping your normal life;

10.2 Error & Approaches

Error	Reason	Approach
The outlet water is cold. The screen is dark.	The plug is not plugged properly. The temperature controller is on the lowest temperature control state; The temperature controller is damaged; The circuit board of the indicator lamp is damaged.	Plug in properly. Set the temperature of the controller in higher state. Inform the service man.
No water out from the hot water outlet	The tap water is cut off. The water pressure is too low. The tap water inlet valve is closed.	Waiting for the restore of the tap water. Wait and use when the water pressure is raised. Open the tap water inlet valve.
Water leakage	Bad tightness in the connecting points between pipes.	Improve the tightness of the connectingpoints.

11. WARRANTY & EXCLUSIONS

STANDARD CONDITIONS - Australia and New Zealand Madimack Pool products. Pty Ltd, distributes Pool products and provides the following warranties:

STATUTORY RIGHTS

1. The benefits to the consumer under this warranty are in addition to other rights and remedies of the consumer under the laws in relation to the goods and services to which the warranty relates; and
2. Our good come with guarantees that cannot be excluded under Autralian Consumer Law. You may be entitled to a replacement or refund for a major failure and for compensation for any other loss or damage, You are also entitiled to have the goods repaired if the goods fil to be of acceptable quality and the failure does not amount to a major failure.

LIMITED WARRANTY

Madimack warrants that its products are free from defects in materials and manufacture for 12months from date of supply by Madimack plus 90 days allow for installation and supply (unless otherwise specified). Madimack will at its discretion, except in the circumstances described below, eother repair or replace any product proven to be defective during warranty period for either materials or manufacture or alternately pay the cost of repair or replacement within 90 days of the receipt of the defective product, barring unforeseen delays. This warranty is for domestic installation only, is personal to the original purchaser and does not pass any subsequent purchaser(s).

- To the extent permitted by law, Madimack will not be liable for products which fail of become defctive during the warranty period as a result of freezing, accident, negligence, improper installation, water chemistry, misuse, tampering or lack of care.
- To the extent permitted by law, except as set out in this Warranty, Madimack excludes all statutory or implied conditions and warranties and any other liability it may have to the Customer (including liability for indirect consequential loss) that may arise under statute or at law including without limitation for breach of contract, in tort (including negligence) or under any other cause of action.
- To the extent permitted by law, except as set out in this Warranty, Madimack limits its liability under any condition or warranty which cannot be legally excluded in relation to the supply of Goods and Services to:
  1. Reparing the Goods:
  2. Replacing the Good or Supplying equivalent Goods or Services again;
  3. Paying the cost of replacing the Goods or of supplying equivalent Goods or Services again; or
  4. Paying the costs of repairing the Goods.

WHAT TO DO IF YOU HAVE WARRANTY CLAIM

The faulty product is to be retured to the place of purchase, or where installed by an approved agent to an authorised warranty agent. No returns will be received directly from end consumers by Madimack.

You are responsible for arranging removal of the defective product and arranging installation of the repaired or replacement product, all transportation (and any applicable insurance costs) of transporting the products to the supplier and transporting the replaced or repaired product from the supplier. All returns are subject to Madimack's written approval and must be accompanied by either:
1. A Field Inspection Report authorised by the Local Customer Service Manager or Authorised Agent; or
2. A "Return Goods Authorisation" formobtained from Madimack prior to shipment.

This warranty warrants that the following heat pump components will remain free of defects for the specified periods from the date of installation:
Tank Cylinder: **5 years**
Compressor: **3 years**
All other components including valves, evaporator, and associated pipe work. All other electrical componentry: **5 years.**

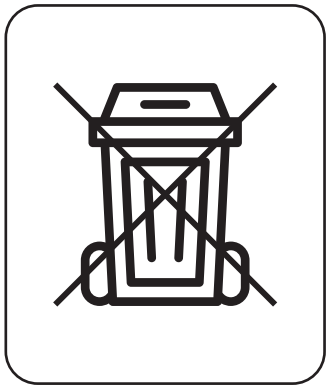
12. DISPOSAL

Observe all safety and warning information during installation and operation.

12.1 DISPOSAL CONSIDERATIONS

The transport and protective packaging has been selected from materials which are environmentally friendly for disposal, and can normally be recycled.

Recycling the packaging reduces the use of raw materials in the manufacturing process and also reduces the amount of waste in landfill sites. Ensure that any plastic wrappings, bags etc. are disposed of safely and kept out of the reach of babies and young children. Danger of suffocation.



12.2 DISPOSING OF YOUR ELECTRICAL PRODUCT

Electrical devices marked with this label may not be disposed of in domestic waste at the end of their service life.

Electrical and electronic appliances often contain valuable materials. They also contain specific materials, compounds and components, which were essential for their correct function and safety. These could be hazardous to human health and to the environment if disposed of with your domestic waste or if handled incorrectly. Please do not, therefore, dispose of your old appliance with your household waste.

Please dispose of those materials by contacting your local authorities and ask for the correct method of disposal. Please ensure that your old appliance poses no risk to children while being stored prior to disposal. By disposing of this product in accordance with the regulations, you protect the environment and the health of those around you from negative consequences.