

**PRODUCT
UPDATE
V2 RELEASE**



QUICK START/INSTALL MANUAL

AIR-SOURCE CO2 HEAT PUMP HOT WATER SYSTEM

INSTALLATION
OPERATION
MAINTENANCE

For the full version of installation
and owner manuals, please visit:
reclaimenergy.com.au/downloads



RECLAIM
ENERGY

COVERING MODEL NUMBERS (FOR STC CLAIMS):

REHP-C02-160GL-V2
 REHP-C02-250GL-V2
 REHP-C02-315GL-V2
 REHP-C02-400GL-V2
 REHP-C02-160SST-V2
 REHP-C02-250SST-V2
 REHP-C02-315SST-V2
 REHP-C02-315SSQ-V2
 REHP-C02-400SST-V2
 REHP-C02-250SS-WIL-V2
 REHP-C02-315SS-WIL-V2
 REHP-C02-250SSEW-V2
 REHP-C02-315SSEW-V2

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 simply scan the QR Code below:



IMPORTANT

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.

WARNING

This appliance may deliver water at high temperature. Refer to the Plumbing Code of Australia (PCA), local requirements and installation instructions to determine if additional delivery temperature control is required.

Issue 06 | November 2023

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PRODUCT UPDATE V2 RELEASE

FEB 2023 PRODUCT SUPPLY CHANGES

As of February 2023, Reclaim Energy will launch the next generation of heat pump with some substantial improvements. Unless specified below, all other parameters/ specifications are the same between V1 and V2 models. The two key changes are summarised in Table A and Table B below:

	V1	V2
STATUS	DISCONTINUED FROM 2023	AVAILABLE FROM 2023
Model Name	EHPE-4540P	EHPE-4550P-A
Max rated power input (kW)	2.3	2.5
COMPRESSOR		
Compressing volume (cm³)	3.80	4.5
Refrigeration Capacity (W)	3470	4900
Communications with the controller	RJ45 cable	Modbus
Connectivity to controllers	V1 & V1.1 models ONLY	V1, V1.1, V2 models

Table A: Key updates on the Reclaim Energy heat pump

V1 – DISCONTINUED



COMES WITH:

- Power cable
- Temperature sensor cable
- RJ45 cable

V1.1



COMES WITH:

- Power cable
- Temperature sensor cable
- RJ45 cable

V2



COMES WITH:

- Power cable
- Temperature sensor cable
- Modbus cable

Figure A: The images of 3 controllers

	V1	V1.1	V2
STATUS	DISCONTINUED FROM 2023	AVAILABLE FROM FEBRUARY 2023	SOFT LAUNCH FROM APRIL 2023
Connectivity to heat pump	RJ 45 cable	RJ 45 cable	Modbus
Connectivity to PV inverters and home management systems	Not available		Dry Contact
Connectivity to Reclaim Mobile app using house Wifi	Not available		Available
Option 1	24/7 time-block		
Option 2	10 pm – 7 am		
Option 3	Midnight – 6 am		
Option 4	10 am – 4 pm		
Option 5	Two time-blocks – first must be set for a minimum of 6 hours and second can be set as little as 0 hours!	Two time-blocks – first must be set for a minimum of 3 hours and second can be set as little as 0 hours!	Two time-blocks – first must be set for a minimum of 3 hours and second can be set as little as 0 hours! Additionally, the turn on temperature can be adjusted for the second time block (i.e., default is 37°C)
Option 6	N/A	One shot boost is activated by a dry contact signal from home management or PV inverters or dry contact smart switches. This is called "Remote" option.	Two time-blocks – first must set for a minimum of 3 hours and second can be set for as little as 0 hours! Additionally, both turn on and turn off temperatures can be adjusted for the second time block (i.e. default is 37°C & 59°C respectively).
Option 7		N/A	One shot boost is activated by a dry contact/modbus signal from home management or PV inverters or dry contact smart switches. This is called "Remote" option. Additionally, a time clock should be adjusted for when the signal is not received by the controller in the 18-hour cycle (i.e. this is to ensure any legionella bacterial growth is controlled in a 24 hour cycle).
Option 8		N/A	Holiday Mode (Trial) – this option is recommended if the hot water user does not require hot water at least 7 days per week. A day and time of the week is to be selected, the heat pump will start at the specified day/time ONCE per week to meet legionella requirements by AS 3498. As per the normal operation of the heat pump, there may be additional cycles over winter for the anti-freeze function operation. (i.e. heating of the water if water in the pipes drops below approximately 3°C).
Option 9		N/A	Wi-Fi control of heat pump using Solar Maximiser tool (by Solar Analytics) – COMING SOON! Heat pump remote integration with Solar Maximiser tool allows optimisation of heat pump operation to maximise Smart Energy options.
Boost function	Available		
Manual Boost function	Available / Website		
Manuals	Website		

Table B: Key updates on the Reclaim Energy controllers

PRODUCT UPDATE V2 RELEASE

KEY CHANGES ON THE SYSTEM MODEL NUMBERS

It is notable that the V2 system model numbers are different to the previously supplied system model numbers. The following codes must be used for rebate applications such as STC, ESC, and VEECs. In terms of STC changes between V1 and V2 models, there has been slight improvement of about 1-3 STCs for different model IDs depending on the system model number and zone.

The latest up to date values should be checked here:

- **STC values:**
rec-registry.gov.au/rec-registry/app/calculators/swh-stc-calculator
- **VEEC values:**
veu-registry.vic.gov.au/Public/Calculator/VEECCalculator.aspx
- **ESC values (estimates only):**
reclaimenergy.com.au



Connection to Wifi and the mobile app is **OPTIONAL** for the end user.

Full functionality of controller can be used manually or via the **FREE** Reclaim Energy app.

FREE APP RECLAIM ENERGY

Available for iOS & Android mobile phones



Figure B: Reclaim Energy Mobile App used with V2 controller

Item	Tank Model ID	V2 models – AVAILABLE FROM 2023		V1 models	
		Heat Pump Model ID	System Model Number	Heat Pump Model ID	System Model Number
1	RE160AGLH	EHPE-4550P-A	REHP-C02-160GL-V2	EHPE-4540P	REHP-C02-160GL
2	APS160TH		REHP-C02-160SST-V2		REHP-C02-160SST
3	RE160WIL		REHP-C02-160SS-WIL-V2		REHP-C02-160SS-WIL
4	RE250AGLH		REHP-C02-250GL-V2		REHP-C02-250GL
5	EWA-250HPT		REHP-C02-250SSEW-V2		REHP-C02-250SSEW
6	APS250TH		REHP-C02-250SST-V2		REHP-C02-250SST
7	TS300-0-E24-S2		REHP-C02-300H-V2		REHP-C02-300H
8	RE315AGLH		REHP-C02-315GL-V2		REHP-C02-315GL
9	EWA-315HPT		REHP-C02-315SSEW-V2		REHP-C02-315SSEW
10	APS315SH		REHP-C02-315SSQ-V2		REHP-C02-315SSQ
11	APS315TH		REHP-C02-315SST-V2		REHP-C02-315SST
12	RE400AGLH		REHP-C02-400GL-V2		REHP-C02-400GL
13	APS400TH		REHP-C02-400SST-V2		REHP-C02-400SST

Table C: Updates on the system model IDs

FIRST TIME COMMISSIONING PROCEDURE

HOW TO USE V1.1 OR V2 CONTROLLERS WITH THE V2 HEAT PUMP

The V2 heat pump default mode is with V1.1 controller. As such, if V1.1 controller is received, simply the controller can be connected to RJ 45 port on the PCB display of heat pump and the general commissioning process to be followed.

If V2 controller is received, the following steps on the heat pump is required before V2 controller can be used:

STEP 1

Connection of correct cable to the right terminal

- V1.1 controller: RJ 45 terminal block to be used
- V2 controller: Modbus terminal block to be used

STEP 2

Change the mode on the PCB display from 1 to 2 using PCB display

Change the value of "r1" to "2" as follows:

1. Press and hold UP (▲) and DOWN (▼) buttons.
2. The value displayed is "r1" & "1"
3. Change the value of "r1" to "2" by pressing the RIGHT (▶) or LEFT (◀) button.
4. Press and hold UP (▲) and DOWN (▼) button to complete the setting when display returns to its original display (i.e. blank display).
5. To check if "r1" & "2" is established, try step 1 one additional time and then go to step 4 to exit.

STEP 1

- Ensure the system plumbing comply with the diagram provided here.

STEP 2

- Ensure the system wiring comply with the diagram here. Make special attention to sensor insertion on the lower level of the tank and the sensor must be fully in.

IMPORTANT NOTE

DO NOT plug in the heat pump or connect the controller communication cable yet

STEP 3

- Ensure you have filled the tank and purged all the air by opening a tap inside the house. The tank will be purged when water runs freely from the tap.
- Turn tap off.
- The cylinder has now been purged.

STEP 4

- Purge the circulating pump by loosening the brass 8mm nut on the underside of the heat pump until water runs freely then tighten again.
- The circulating pump has now been purged.

SYSTEM START-UP SEQUENCE

The system is now starting up and will go through the following sequence:

- 1 The system will run a 5 minute purge that pushes any air within the heat pump unit into the tank. Note the unit fan won't be turning at this point.
- 2 After this 5 minute period the pump will stop and the fan will turn slowly. The system will not be heating up until the unit can maintain a consistent 63°C (this may take up to 4 minutes).

STEP 5

Commission the controller

- select correct time of day
- select the desirable operational mode (i.e. options 1-6)
- power up the controller and connect the communication cable to heat pump

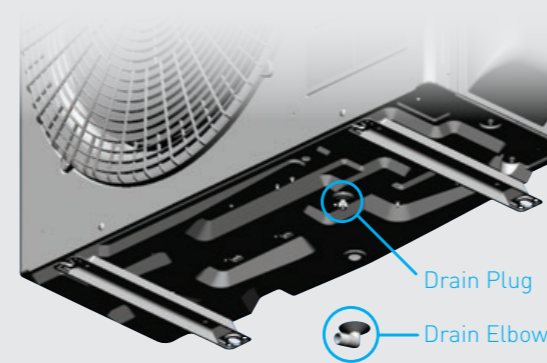
STEP 6

- Initiate auto purge and system start up.
- Ensure the system controller is turned on and the time is displayed.
- Ensure the heat pump isolator is in the on position and power is on to heat pump unit.
- On the controller, push and hold the "menu" or "OK" button (i.e. "menu" for V1 controller and "OK" for V2 controller) until the word "purge" is displayed and flashing (approx 5 seconds).
- Now let go of the button.
- In about 4 seconds you should hear the on-board circulating pump come on.

CRITICAL NOTES

NOTE 1

Remember to drain and purge the heat pump on commissioning (otherwise system might fail) – the "drain plug" is shown below. Also, remember to drain from hot water taps inside the house.



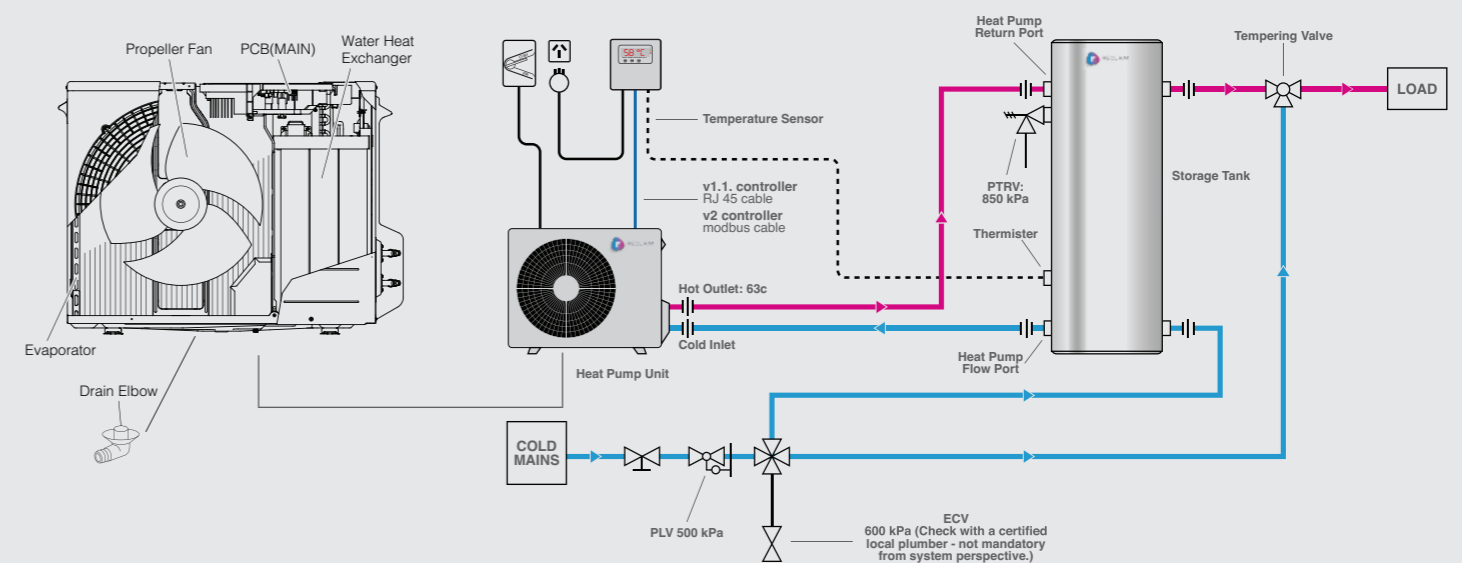
NOTE 2

Sensor probe must be fully inserted and secured (using gland or silicon plug) in the bottom tank sensor. The sensor cable comes with a rubber sleeve. Fully push the sensor in and then push the cable sleeve until only 6 mm is protruding. Then tighten up the gland so the sensor is firmly held.



NOTE 3

Maximum horizontal distance is 10 m and vertical distance is 5 m between heat pump and tank (max of 3 bendings)



SYSTEM DESCRIPTION

The following system description section provides a brief overview of the the Air-Source CO2 Hot Water Pump's main components and functionality.

1.1 MAIN COMPONENTS

The system components of the air sourced heat pump that customers will receive include:
Heat pump Unit, Storage Tank with PTRV, Controller, Heat pump mounting legs.

1.2 SYSTEM OPERATION

The CO2 heat pump unit receives cold water from the bottom of the tank. Using the heat from the ambient air the heat pump heats the CO2 refrigerant to generate hot water. The hot water returning from the heat pump unit (fixed at 63°C) is injected into the top of the tank to provide fast hot water recovery and excellent hot water stratification. As this system delivers hot water exceeding 50 °C, a tempering valve must be installed for delivery of hot water to bathrooms. Untempered water may be delivered to kitchen and laundry according to AU/NZS AS 3500 plumbing code.

The heat pump operation is controlled by an external controller. The controller operates based on a sensor connected to the tank at 55 – 69% level depending on tank model i.d. The heat pump will be turned on if the temperature at the sensor level on the tank drops below 59°C for the first cycle or 37°C for the second cycle in a day and it will be run until the tank temperature at sensor level reaches 59°C. The system controls are designed to ensure that it meets the legionella requirements as specified in the Australian standards. The heat pump will run until the sensor level on the tank reaches 59°C. In the subsequent heating cycles of every 24-hour period, the heat pump "turn off" logic is adjustable by built-in timer settings.

The default timer setting is programmed to run on continuous operation but this can be adjusted by the installer based on the home owner requirements to suit their needs. More details regarding the controller operation and settings is outlined in Section 2.

At ambient temperatures below 5.5°C, frosting may occur, if this happens the heat pump will go into defrost mode in order to protect the unit (i.e. this defrost functionality will turn the heat pump on and will normally run for no more

than 15 minutes in duration). When the unit is in the defrost function the pump and fan will stop and the refrigerant heat will defrost the evaporator. As defrost advances, the evaporator temperature will increase.

When a set temperature (preprogrammed) is achieved, the defrost operation stops and the heat pump will operate in line with its normal settings. More details regarding the controller operation and settings is outlined in Section 6.

The "operational window" in this context refers to heat pump "hot water production" mode which can be set by using one of the options on the controller. From time to time, especially during the winter and in very cold climates, the heat pump operation may be disrupted or extended by a built-in anti-freeze or defrost operational mode. The defrost cycle can occur ONLY during the operational window to defrost the ice build-up on the evaporator at the back of the unit which is an air-CO2 heat exchanger. The defrost cycle occurs when the ambient temperature is less than about 5 °C. During the defrost operation, the fan and pump stop, and the high-temperature refrigerant which is originally used for hot water production shall be supplied in order to melt frosts on the evaporator (=air-CO2 heat exchanger).

The frost cycle can take about 5 minutes and this can happen multiple times depending on the ambient temperature, so in total, up to 20 minutes can be expected for the entire defrost cycle. The heat pump also comes with a built-in freeze protection cycle. Anti-freeze operation can ONLY occur outside the operational window of the heat pump and the purpose of the cycle is to protect the water circuit (i.e. piping between tank and heat pump) from water freezing. If the ambient and water pipe temperatures drop below 3 °C, the heat pump will do the anti-freeze operation. During the anti-freeze operation, the heat pump works as a normal heating cycle so the fan and pump should be running. The anti-freeze operation stops when the water inlet temperature reaches 56 °C or ambient temperature reaches 6 °C.

INSTALLATION DETAILS

This section relates to the preparation and the installation process for the Reclaim Air-Source CO2 Heat Pump system.

The installation of a Reclaim Energy air source heat pump can only be completed by a licensed plumber or electrician in accordance with the local standards and regulations please see:

- AS/NZS 3000 – Electrical installations rules: Electrical requirements of the system are 240v, 50 Hz, single phase, with 15 Amp circuit breaker. This appliance is to be wired with a disconnection device, as per AS/NZS 3000 wiring rules
- AS/NZS 3500 – National plumbing and Drainage Code: The Heat Pump component of the system is to be fitted outside.
- AS/NZS 2712.2007 – Solar and Heat Pump Water Heaters: Design and Construction
- AS/NZS AS 3498—2009 – Water heaters and hot-water storage tanks

A licensed installer must adhere to occupational health and safety guidelines and other relevant industry associations. Under no circumstances should any installer attempt to install a Reclaim Energy system without reading and understanding this installation manual. For any queries Reclaim Energy staff may be contacted on 1300 38 38 15.

Note that the Reclaim Energy system has been designed to provide hot water for domestic applications only, other applications such as space heating are not supported by this product. Installing the unit for any other application other than for domestic hot water application will void the warranty. The installation guide for each major component of the system as well as the whole system is covered in this section.

The following sequence is recommended for installation:

1. Conduct site inspection
2. Identify heat pump and tank installation location
3. Plan system integration: Piping and fittings
4. Testing and commissioning

2.1 SITE INSPECTION AND INSTALLATION PREPARATION

The very first step of installation is to find an appropriate location for the installation of the heat pump unit that includes: heat pump, tank, timer, and the controller. It is recommended that:

- To reduce the heat loss from piping, the whole system should be installed as close as possible to the main hot water points in the house (kitchen and/or bathrooms).
- The maximum distance between controller/timer, tank, and heat pump should not exceed 10 m. .
- It is recommended that the heat pump is installed on the ground next to the tank.
- The heat pump unit **MUST** be installed outdoors, the tank can be installed indoors.
- The back of heat pump unit draws in ambient air therefore it **MUST NOT** be covered. In order to have sufficient air circulation behind the heat pump, the minimum free space should be 0.15 m.
- The system requires at least two GPO power outlets (one for controller, one for heat pump).
- The mounting surface of tank and heat pump **MUST** be horizontal.
- The clearance on front and back of the unit are 350 mm and 600 mm- please refer to Figure 2.
- The tank **MUST** be installed on a concrete slab on the ground.
- Water supply quality must be in line with the specifications of the heat pump unit and the storage tank being installed.

INSTALLATION DETAILS CONT.

Water quality is an important aspect that can influence the systems operations and functionality. For the system to be warranted the water used in the system must meet the requirements outlined in Table 1 below.

Total Dissolved Solids	< 600 mg/L or ppm
Total Hardness (CaCO₃)	< 200 mg/L or ppm
Electrical Conductivity	850 µS/cm
Chloride	< 200 mg/L or ppm
pH Level	Min 6.5 to Max. 8
Magnesium	< 10 mg/L or ppm
Sodium	< 150 mg/L or ppm
Iron	< 1mg/L or ppm
Alkalinity (as CaCO₃)	< 200 mg/L or ppm
Dissolved (free) CO₂	< 25 mg/L or ppm

Table 1: Water Quality Threshold Values.

If you have doubts regarding water quality please contact your local water authority or have a water test completed. In areas of poor water quality all major components will have a reduced life due to the hardness of the water. In areas with "hard water" (>200 mg/L or ppm), a water softening device must be installed to ensure the long term efficient operation of the system is met. Note that the Reclaim Energy glass-lined tank has a sacrificial anode to protect the vessel from corrosion. The glass line tank warranty is linked to an anode inspection that must be carried out every three (3) years.

2.1.1 COMPONENT INSPECTION

Prior to installation, please check that the following components have been provided. Any concerns must be brought to the attention of Reclaim Energy immediately.

- Heat pump unit
- Tank + PTRV
- Controller module
- Heat pump mounting frames (checked with a reseller)

2.1.2 COMPONENT TRANSPORTATION

- When transporting boxes, note the orientation of the "THIS WAY UP" arrows.
- Ensure all boxes are strapped and secured to prevent movement during transit.
- All tanks must be transported upright. Stacking is not recommended for any tanks.
- Products should always be handled with care. Damage incurred during the transportation is not covered under product warranty.

2.1.3 UNPACKING OF THE COMPONENTS

- When unpacking, take care to ensure that the components are not damaged in the process.
- Avoid using sharp blades or knives as this can scratch the surfaces of the products.

NOTE

All other components required for the installation not listed here should be provided by the installer.

2.2 HOT WATER STORAGE TANK

2.2.1 INSTALLATION LOCATION

- The storage tank must be installed at ground or floor level and must stand vertically upright as per the manufacturer guidelines.
- Tanks must be secured on a concrete or plastic mounting slab as shown in Figure 1.
- The storage tank should be located as close as possible to the most frequent draw off points in the building such as the bathroom or kitchen. If the storage tank is located a long way from hot water draw points, a hot water circulation loop on a timer may be considered to reduce the time-lag for water to reach the tap. Please note this is not supplied by Reclaim Energy but the installing plumber can consider installing a ring main system for hot water circulation.
- The tank should not obstruct any windows, doors or exits. Clearances must be provided to make servicing and maintenance convenient without the need for ladder or scaffold. For servicing, the PTRV must also be easily accessible.

- The tank should be positioned to allow room for anode removal.
- The storage tank must be installed in a properly drained safe tray if installed indoors where leakage may cause damage. The installation of the storage tank and safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements with regards to its construction, installation and draining. Tanks installed outside must be installed on a suitable concrete slab.
- The tank label must be clearly visible.



Figure 1: Concrete or heavy duty plastic slabs to be placed under the storage tank.

INSTALLATION DETAILS CONT.

2.3 HEAT PUMP

Before plumbing and/or wiring of the heat pump unit and integration with the rest of the system, the following sequential steps must be conducted.

2.3.1 INSTALLATION LOCATION AND SPACING

- Be sure to install the heat pump unit horizontally on a flat surface.
- Be sure to install the heat pump unit in accordance with the spacing provided in Figure 2.

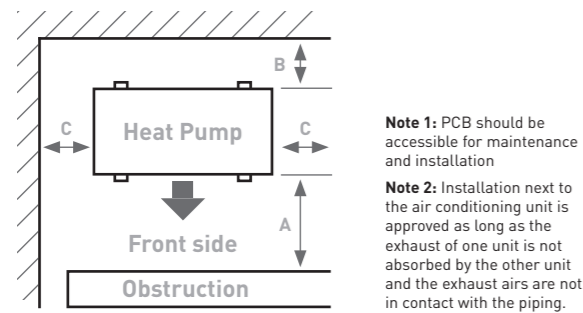


Figure 2: Required space for installation of heat pump.

- A** 350mm and longer in case that the height of obstruction is below 1,200mm 600mm and longer in case that the height of obstruction is 1,200mm and higher
- B** 150mm and longer
- C** 150mm and longer

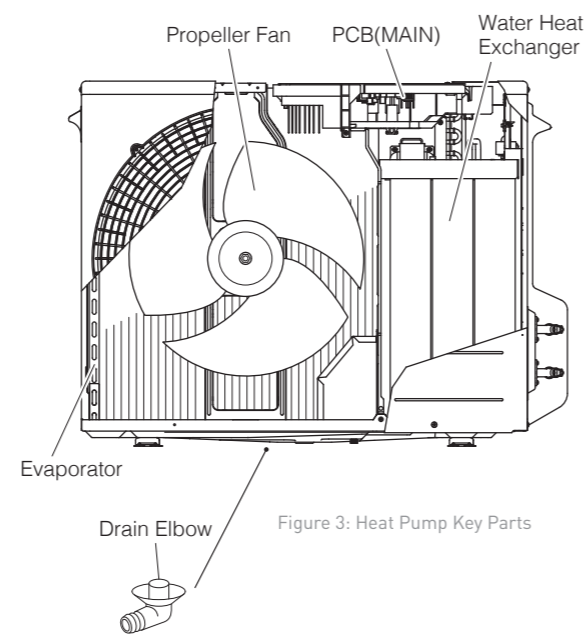
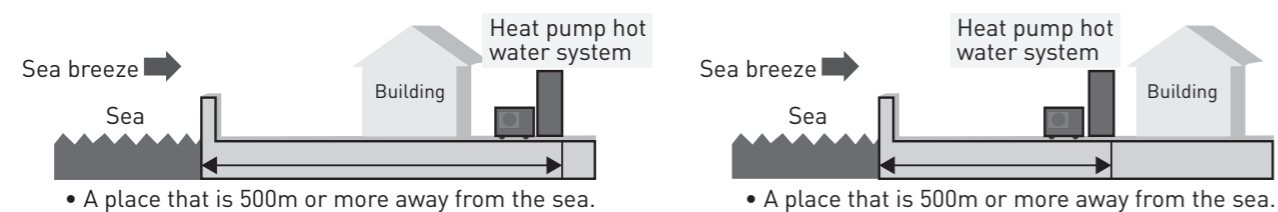


Figure 3: Heat Pump Key Parts

For coastal areas, install in the following places (Otherwise, it may cause a malfunction)

- Places where sea water and/or sea breeze do not directly hit as much.
- Places with good drainage.
- Places where the salt etc. adhered to the main body of the heat pump hot water system can be thoroughly washed away by rain water.



2.3.2 MOUNTING

Note Reclaim Energy ASHP **MUST** be installed on the ground with mounting frames that is a default supplied component **OR** on the wall with brackets. Note, a plumber needs to have access to the underneath of unit in order to service the unit and to complete the purge protocols.



Figure 4: Ground mounting frames.



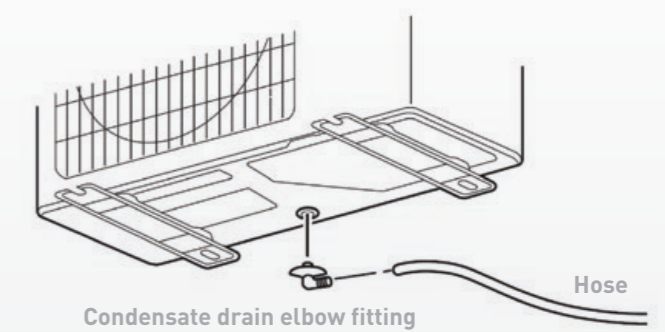
Figure 5: Wall mounting brackets



Figure 6: A heat pump drain elbow plug supplied with heat pump unit.

2.3.3 ATTACHING THE DRAIN ELBOW PLUG

A drain plug is supplied in the bottom side of the heat pump unit box packaging as shown in Figure 7. Per schematic shown, safely connect the drain elbow and guide the drain hose to the ditch if required.



Condensate drain elbow fitting

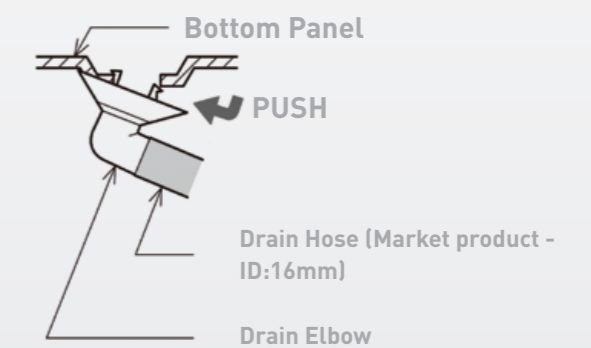


Figure 7: How to attach drain elbow.

2.3.4 REMOVING/ATTACHING THE PIPING COVER

REMOVAL

- 1 Remove the screw
- 2 Remove the piping cover sliding downward.

ATTACHMENT

- 1 Fit the piping cover to the unit adjusting 5 tabs.
- 2 Attach the piping cover sliding upward and fix it with the screw.

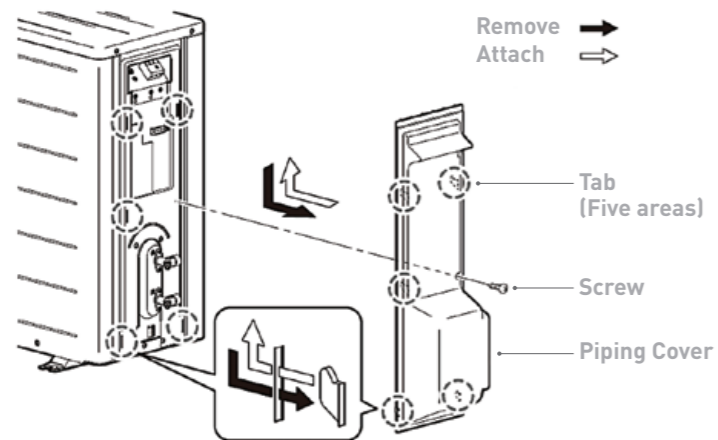


Figure 8: How to attach/detach the piping cover.



2.3.5 HEAT PUMP WATER PIPING INSTALLATION

After removing the right side piping cover of heat pump unit, the heat pump cold (inlet) and hot (outlet) pipes (connection ports) will be accessible as shown in Figure 9.

The hot water outlet from the heat pump should be plumbed up to the top port on the tank (i.e., marked heat pump return on the tank). The cold water inlet to the heat pump should be drawn from the bottom of tank port (i.e. marked heat pump flow). The piping between heat pump and tank recommended to be as minimal as possible. There should be no valve such as non return valve or strainer installed between heat pump and tank plumbing. The piping should have no restrictions. All hot pipes including the PTRV must be fully insulated.

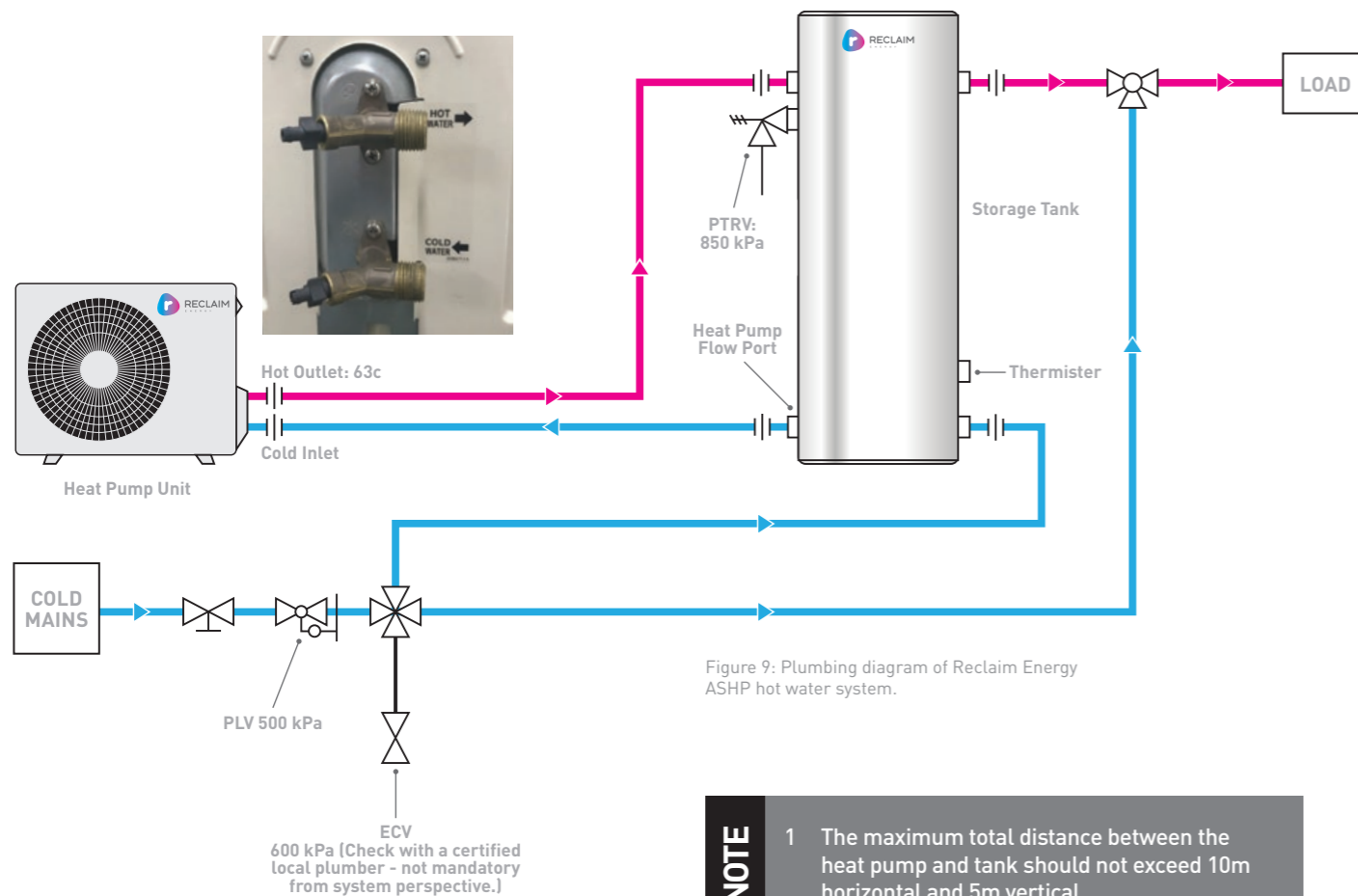


Figure 9: Plumbing diagram of Reclaim Energy ASHP hot water system.

NOTE

- 1 The maximum total distance between the heat pump and tank should not exceed 10m horizontal and 5m vertical.
- 2 The heat pump can be under or above the level of tank for a distance up to 5m.
- 3 The maximum number of bends allowed is 4.
- 4 Do not put any restrictive valves such as check valves or strainers in the heat pump flow/return lines. This will void warranty and affect the units performance
- 5 A 15 A isolator switch is recommended to isolate the heat pump unit.
- 6 Sensors should be entirely pushed into the tank and tight up to the gland.

INSTALLATION DETAILS CONT.

2.3.6 SYSTEM WIRING

A licensed electrician should install the system with regards to the wiring diagram provided in Figure 10 and in accordance with local/national wiring codes. The power cord chosen must be compliant with AS/NZS 3191 and the nominal cross-sectional area should be 1.5 mm² or more.

It is notable that the heat pump must be installed on its own circuit (i.e. 15 A circuit)- AND hard wired to a 15 A ISOLATOR SWITCH. The controller has its own plug and must be connected to a separate power point. The power point supplying the controller can be fed from the heat pump circuit.

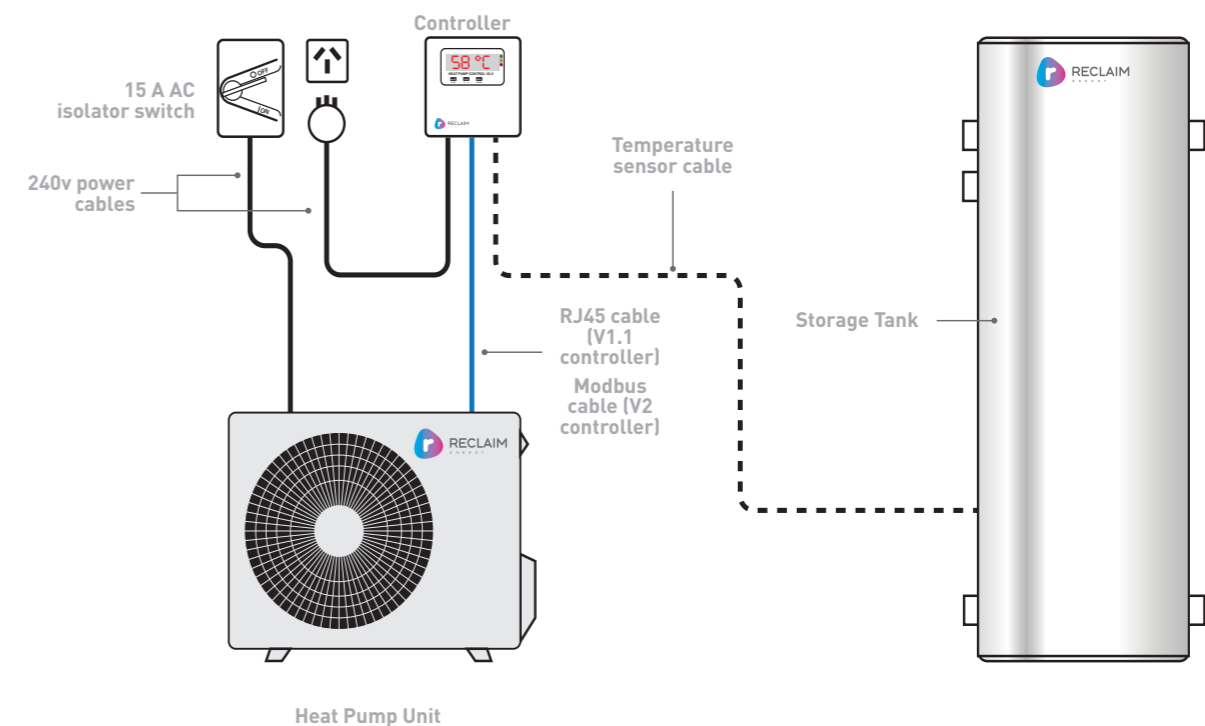


Figure 10 Wiring diagram of Reclaim Energy ASHP hot water system.

IMPORTANT

Do not supply power to the controller or heat pump unit before conducting the process explained in section 6.5.3 and 6.5.4.

If V2 controller is received, the method of fastening up the modbus cable is similar to what shown below (i.e. modbus terminal is different to that of power terminal as shown in Figure 11)

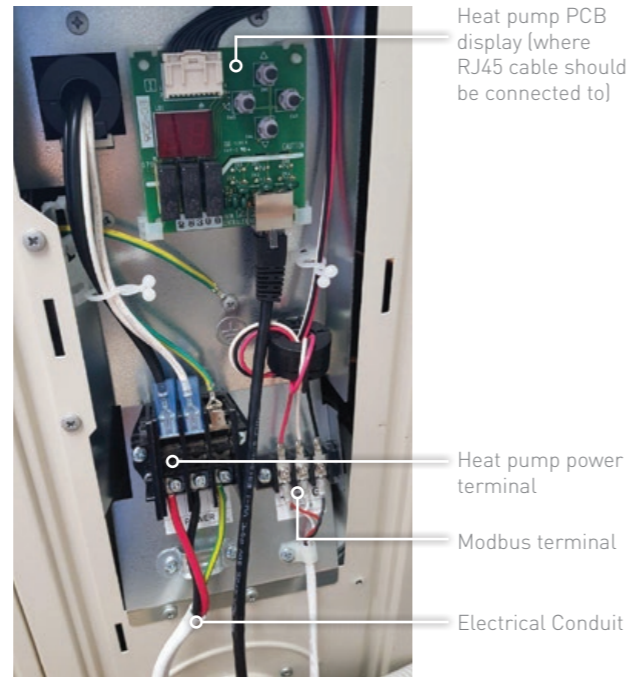


Figure 11: The wiring of power cord from heat pump terminal to the heat pump GPO.

The process of connecting the power cable to the heat pump terminal is shown in figures below:

POWER SUPPLY TERMINAL BLOCK:

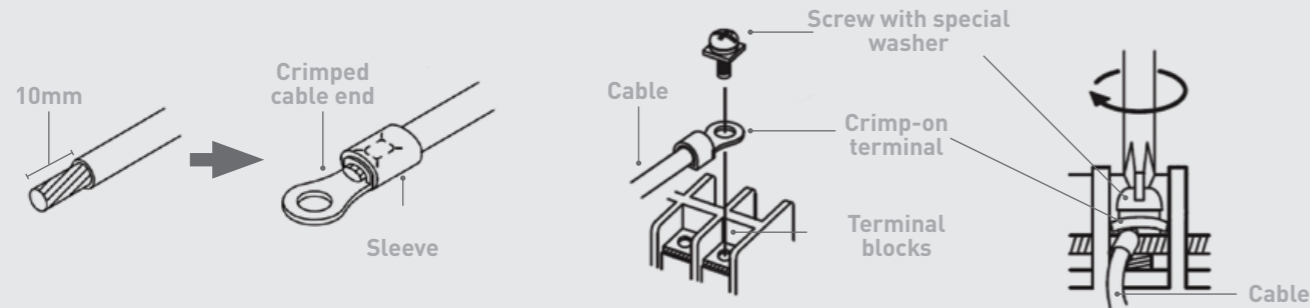
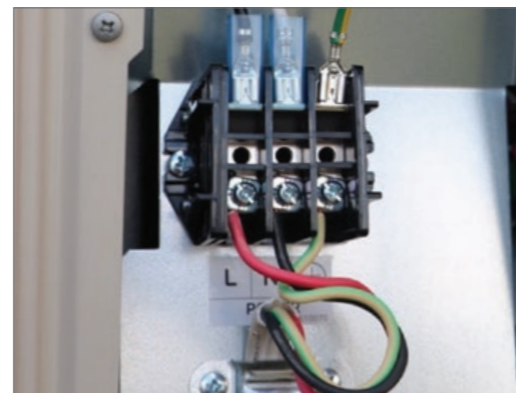
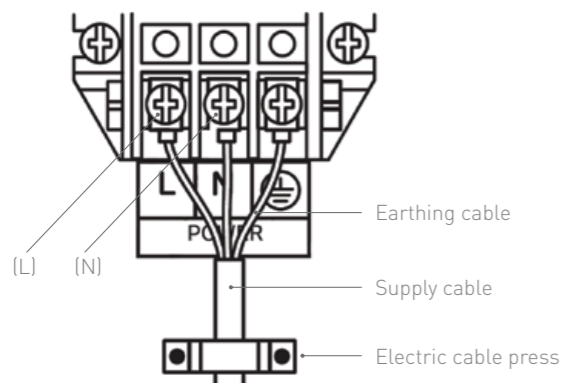


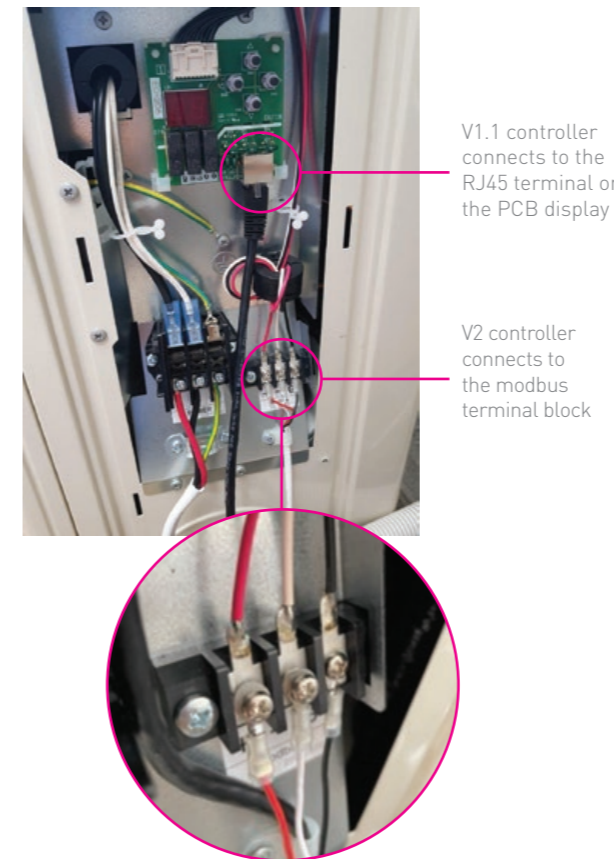
Figure 12: How to attach the power cable.



2.4 CONNECTING V1.1 OR V2 CONTROLLER TO THE HEAT PUMP

The communication protocol used in V2 controller is different to that of V1.1. controller:

- If V1.1 controller is received, the RJ45 cable from the controller should be wired up to the heat pump
- If V2 controller is received, the modbus cable should be wired up to the heat pump



To wire up the modbus, the screws must be opened and after the insertion of the modbus crimp wire, the screws must be completely tightened up.

CONTROLLER KEY FUNCTIONS

Regardless of the version of controller received, the installer must ensure the following:

1. The controller power cable is wired up to the power point
2. The controller communication cable is correctly wired up to the heat pump
 - a. RJ 45 cable for V1.1 controller
 - b. Modbus cable for V2 controller
3. With reference to the controller manual
 - a. The time of day is correctly selected on the controller
 - b. The operational mode is set per customer requirement (i.e., default is option 1)
 - c. Applicable to V2 controller only: The Wi-Fi function on the controller is enabled and end user successfully connects the controller to the house Wi-Fi and Reclaim Energy mobile app
4. The heat pump is purged by the controller during the commissioning
 - a. Press and hold the "menu" or "OK" button on the controller will initiate the 5-minute purge cycle.
5. Before installer leaves the site, he/she must ensure that the heat pump receives signal from the controller and the "heat up" process has been started (i.e., fan is spinning, and hot water outlet pipes are hot and reached +60°C). If time of day contradicts the option settings (e.g., for example if the installer installs the system at 10 am and the option selected is option 3), to ensure the communications between heat pump and controller is established, it is recommended to initiate the heat up cycle by using the boost function.

CHECKLIST

ITEM	CHECK
GENERAL	
Water supply is in accordance with water quality standard.	
There is no leakage from the pipes.	
There is no flammable hazardous materials around the unit.	
There is no damage, deformation or contamination to any components.	
There is enough space for inspection / repair of each component?	
The floor below the tank/heat pump has been properly water proofed and is capable of supporting the component.	
Hot water is available with enough pressure at the taps inside the house.	
HEAT PUMP	
The heat pump unit has been installed properly in line with these guidelines.	
The drain plug is properly closed	
The drain of heat pump unit is in the correct position to drain.	
A two-step air purge operation has been completed successfully.	
The wiring cover on the heat pump is correctly closed.	
TANK	
The operation of PTRV is normal.	
The tank unit is fixed in place with anchor bolts if necessary.	
PIPING/WIRING	
The mains breaker is of the correct size and voltage Breaker can be turned off, local disconnect is in place. The movement of circuit breaker is correct.	
Power supply wiring, ground wire, and "On/Off RJ45 cables" are fixed firmly.	
Union joints are used so that the parts can be easily removed.	
The insulation work for piping has been conducted properly.	
CONTROLLER	
Check all 3 connections are correctly firm and in place: 1 – communication (RJ45 patch or modbus) cable to heat pump unit, 2 – Sensor cable to tank, 3 – Power is connected.	
Correct time of day has been set up on the first powering.	
Controller operational mode (OPTION modes) has been set up with reference to the customer requirement.	

2.5 POST INSTALLATION INSPECTION CHECKLIST

A licensed installer should check for the following before leaving the installation site.

System check: Check all connections for leaks and that all components are installed as per this manual.

Take photos of all system components for warranty purposes. This should include photos of the plumbing lines to and from the tank, heat pump and sensor port connection.

Note down the Tank Serial Number.

Note down the heat pump Serial Number.

Note down the controller Serial Number.

Fill out the installation record form supplied for system warranty and service issues.

Submit your Installation Record Form via Email: warranty@reclaimenergy.com.au

Complete the rebate form for the system prior to leaving the site, this will require the installer's signature. Note this form is not supplied with us or in this document. This is responsibility of customers to have the rebate form ready for the installer to fill out.

OPERATION AND MAINTENANCE

3.1 HEAT PUMP

3.1.1. CHECK FOR THE OPERATIONAL MODE

It is recommended that the end user check the operation of heat pump matches with the options setting at least once per month. If the heat pump runs outside the settings of the active option, this needs to be escalated to the local service agent and/or Reclaim Energy representative for troubleshooting. There are some possibilities for running outside of setting of controller such as 1) tank sensor is loose and controller does not read the correct temperature of the tank 2) in winter time, the system can undergo freeze or frost protection cycles which are additional cycles compared to normal settings 3) Boost function accidentally has been activated.

3.1.2. CHECK FOR AIR FLOW/ WATER BLOCKAGE

It is recommended that the drain tray of heat pump is checked at least once per year for a possible blockage. The same applies to the surrounding of heat pump and if plant is growing around the heat pump, that needs to be trimmed frequently to allow for the natural ventilation of system.

3.1.3. CHECK FOR ERROR CODES

Apart from running outside the cycle of operational modes, should the heat pump or controller runs into an issue, the controller or heat pump should generate an error code or simply the end user will run out of hot water. Each error code on the controller has its corresponding error code label on the heat pump PCB display. If there is an error code on the controller but PCB display does not show an error, this can imply that the communication cable is damaged or not working (i.e., possible controller fault or communication cable fault). Table below summarizes the full list of error codes and possible solutions.

ERROR CODE TABLE

ERROR CODES								
REMOTE CONTROL	PCB	APPEARANCE, PORTION, PARTS SEEMED WRONG	METHOD OF CHECK	TROUBLESHOOTING	ERROR RESET			
Eg-1	H9	Outdoor temp. sensor error	Outdoor temp. sensor	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Auto		
		PCB(Main)		-	PCB (Main) should be replaced.			
	HC	Outgoing water temp. sensor error	Outgoing water temp. sensor	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Auto		
		PCB(Main)		-	PCB (Main) should be replaced.			
	J3	Discharge temp. sensor error	Discharge temp. sensor	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Auto		
			PCB(Main)		-			
	J5	Suction temp. sensor error	Suction temp. sensor error	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Auto		
			PCB(Main)		-			
	J6	Defrost temp. sensor error	Defrost sensor error	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Auto		
			PCB(Main)		-			
J8	Return water temp. sensor error	Return water temp. sensor	Check the resistance value by tester.	Sensor should be replaced if broken.	Auto			
		PCB(Main)		-				PCB (Main) should be replaced.
Eg-2	E6	Start-up failure of compressor	Compressor connector	Check the connection of compressor connector.	Once checked, restart the HP unit.	Power OFF		
			PCB or HP unit		-			PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.
	H6	Abnormal revolution of compressor	Drop of power voltage	Check the power voltage.	Check the power voltage.	Power OFF		
			Heating water circulation circuit	Check if there are any conditions to block water flow such as clogging, air entrainment, or scale precipitation.	Once checked, restart the HP unit.			
			Each sensor	Check the resistance value by tester.	Sensor should be replaced if broken.			
			Heating pump error	Touch the pump to check if it operates or not.	Pump should be replaced if broken.			
			Expansion valve coil	Check the disconnection or short circuit.	Expansion valve coil shall be replaced if there is a disconnection or short circuit.			
	PCB or HP unit		-	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.				
	U0	Stop by detecting gas leakage	Discharge temp. sensor	Check the resistance value by tester.	Sensor should be replaced if broken.	Power OFF		
			Expansion valve coil	Check the disconnection or short circuit.	Expansion valve coil shall be replaced if there is a disconnection or short circuit.			
PCB (Main) or HP unit				-	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.			
Eg-3	E1	PCB failure	PCB	Reset power supply.	PCB (Main) should be replaced if the problem is not solved.	Power OFF		
	E8	Stop by detecting input overcurrent	Drop of power voltage	Check the power voltage.	Check the power voltage.	Power OFF		
			Installation condition	Check the installation condition of HP unit. (blocked air inlet port)	(blocked air inlet port) Change the installation position to keep the air inlet port area not blocked.			
			Each sensor	Check the resistance value by tester.	Sensor should be replaced if broken.			
			Heating pump error	Touch the pump to check if it operates or not.	Pump should be replaced if broken.			
			Expansion valve coil	Check the disconnection or short circuit.	Expansion valve coil should be replaced if there is a disconnection or short circuit.			
PCB (Main) or HP unit		-	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.					

Table 11: Details of error codes on external controller and heat pump PCB display and troubleshooting process

CONTINUES ON NEXT PAGE...

ERROR CODES		APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK	TROUBLESHOOTING	ERROR RESET
REMOTE CONTROL	PCB					
Eg-3	H8	Current detection error	PCB(Main)	Reset power supply.	PCB (Main) should be replaced if the problem is not solved.	Power OFF
	L4	Module temperature error(90°C or higher)	Installation condition	Check the installation condition of HP unit. (blocked air inlet port)	Change the installation position to keep the air inlet port area not blocked.	Power OFF
			finned heat exchanger (for air)	Check if there are any spots on the fin or not.	Once checked, restart the HP unit.	
			Fan motor	Check if there are any foreign substances to block the fan motor or not.	If the problem is not solved, fan motor should be replaced.	
			PCB(Main)	-	PCB (Main) should be replaced.	
	L5	Detecting output overcurrent	Discharge temp. sensor	Check the resistance value by tester.	Sensor should be replaced if it is broken.	Power OFF
			Expansion valve coil	Check the disconnection or short circuit.	Expansion valve coil should be replaced if there is a disconnection or short circuit.	
			PCB (Main) or HP unit	When reset power supply, compressor repeats start and stop.	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.	
	P4	Module sensor error	PCB(Main)	Reset power supply.	PCB (Main) should be replaced if the problem is not solved.	Auto
	U2	Power voltage error	Drop of power voltage	Check the power voltage.	Check the power voltage.	
PCB(Main)			Reset power supply.	PCB (Main) should be replaced if the problem is not solved.	Power OFF	
Eg-4	HJ	Water Circulation system failure	Heating water circulation circuit	Check if there are any conditions to block water flow such as clogging, air entrainment, or scale precipitation.	Once checked, restart the HP unit.	Power OFF
			Each sensor	Check the resistance value by tester.	Sensor should be replaced if it is broken.	
			Expansion valve	Check the disconnection or short circuit.	Expansion valve coil should be replaced if there is a disconnection or short circuit.	
			PCB (Main) or HP unit	-	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.	
	EC	Stop by outgoing water temperature error	Heating water circulation circuit	Check if there are any conditions to block water flow such as clogging, air entrainment, or scale precipitation.	Once checked, restart the HP unit.	Power OFF
			Outgoing water temp. sensor	Check the resistance value by tester.	Sensor shall be replaced if it is broken.	
			Heating pump	Check if heating pump is operating by touching it.	If heating pump is broken, it is necessary to replace it.	
			PCB (Main) or HP unit	-	PCB (Main) should be replaced. If the problem is not solved, HP unit should be replaced.	
Eg-5	E9	Heating pump error	Tank	Check if water in the tank is full capacity level.	Once checked, conduct test operation for air purge again.	Power OFF
			Heating pump error	Check the number of rotation of heating pump on the PCBdisplay.	Heating pump and PCB (Main) should be replaced if heating pump is not rotated. Heating pump should be replaced if the rotation of heating pump is clearly low. PCB (Main) should be replaced if the rotation of heating pump is normal and E9 error is displayed.	
			PCB(Main)			
Eg-6	E7	Outdoor fan lock	Fan motor	Check if there are any clogging around fan motor or contact failures of connector.	Improve the cause of problem. If the problem is not solved, fan motor shall be replaced.	Power OFF
			PCB(Main)	Other than described above	PCB (Main) shall be replaced.	
Eg-7	F3	Stop by Discharge temperature error	Discharge temp. sensor	Check the resistance value by tester.	Sensor shall be replaced if it is broken. If sensor has no problem, expansion valve coil shall be replaced.	Power OFF
			Expansion valve coil	Check the disconnection or short circuit.	Expansion valve coil shall be replaced if there is a disconnection or short circuit.	
			PCB (Main) or HP unit	Other than described above	PCB (Main) shall be replaced. If the problem is not solved, HP unit shall be replaced.	
Eg-8	-	No detection of tank sensor	Tank sensor	Please contact Reclaim Energy Support on: 1300 38 38 15	Improve the cause of problem, then restart the HP unit.	Auto
Eg-9	-	Tank sensor failure	Tank sensor	Please contact Reclaim Energy Support on: 1300 38 38 15	Sensor shall be replaced if it is broken.	Auto

ERROR CODES		APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK	TROUBLESHOOTING	ERROR RESET
REMOTE CONTROL	PCB					
Eg-10	-	Loose tank sensor issue	Tank sensor	Check if the the temperature probe on the tank has been pushed all the way in. Please contact Reclaim Energy for support on: 1300 383815	Sensor shall be pushed all the way in through the tank sensor pocket. Or possible issue with controller or temperature sensor.	Auto
Eg-11	-	Modbus sensor	Modbus cable	Please contact Reclaim Energy Support on: 1300 38 38 15	Modbus cable or V2 controller should be fixed or replaced.	Auto
Eg-20 - 23	-	Wi-Fi errors	V2 controller wifi connection issue	Please contact Reclaim Energy Support on: 1300 38 38 15	Wifi connection issue can be due to poor network. It is likely that there is not possibly for use of wifi function unless a better network is provided for the controller. The wifi should be disabled and controller can be used manually with no mobile app.	Auto

3.2 HOT WATER STORAGE TANK

3.2.1 PTRV

Any system design must allow a means of pressure release at no more than 850kPa, using a PTRV. The PTRV must have a downward direction copper pipe connected that is open to the atmosphere, running the expelled hot water or air to a safe, frost free and appropriate drainage location. From time to time the PTRV may discharge small amounts of water under normal operations (1L for every 50 Liters heated). If the tank is installed indoors, a safe-tray must be installed beneath the hot water tank to safely collect any water expelled from the PTRV.

PTRV check every 6 months: Test the manual relief by lifting the lever. Water should come out of the relief valve. It is recommended that the manual relief be operated every 6 months, so as to flush out any deposits that may accumulate under the seal.

3.2.2 ANODE

The anode on your Glass lined (vitreous enamel) tanks is sacrificial, however it is designed to protect the vitreous enamel lined cylinder in most public reticulated water supplies for five years after which time it should be replaced as part of an annual service. It must be noted however that many water supplies can exhibit chemical qualities that are not suitable for the standard anode supplied with glass-lined water heater. Where the Total Dissolved Solids (TDS) is greater than 600mg/L or less than 40mg/L, the installed anode may be unsuitable for use to protect your water heater. In these circumstances, a plumber or authorized service person should be contacted to fit the correct (hard water) anode. Please note that warranty becomes void if the TDS value exceeds 2500 mg/L. Check the tank anode (for glass-lined tanks only) every 3 years.

3.2.3 HYDROGEN BUILD UP

Glass lined (vitreous enamel) tanks are fitted with a Magnesium anode to provide corrosion protection for the tank from the storage water. Small quantities of hydrogen gas can be released by the anode, which generally remains dissolved in the water and flushed away as hot water is used from the tank. Depending on the water quality there may be a degree of hydrogen build-up in the tank if the water heater hasn't been used for two or more weeks or if water appears milky in color. To resolve the build-up of hydrogen within the tank, "purge" the tank for approximately 30 seconds from the lever on the PTRV. Stand clear of PTRV discharge piping outlet.

WARNING

Ensure there are no open flames or ignition sources close to the tank.



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