



Neopower Flat Panel Solar Hot Water Installation and Operation Manual

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1 Important Information

1.1 Scope of Manual

This manual is only apply to the installation and operation of the Neopower solar hot water system. Details for the installation, operation and maintenance of the complete solar hot water heating system are described in this manual. This manual is primarily a reference document for the installer but not permitted to be installed for anyone who isn't authorized by Neopower.

1.2 Local Standards

The installation must comply with the requirements of AS/NZS 3500.4, AS/NZS 3000, and all local codes and regulatory authority requirements. In New Zealand, the installation must comply with New Zealand Building Code G12.

1.3 Qualified Installer

Installation must be completed or check off by a licensed plumber.

Installer must also hold relevant industry licenses or certificates required for the work completed during installation process.

Unless otherwise specified in section 3, no part of Neopower solar collector may be checked off or repaired by any other person than an authorized person(s).

Neopower Solar Water System is recommended to be installed at the place where is close to the water pipe and power supply. Safety device is usually installed at the areas where leakage may occur easily.

Appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. Children should be supervised by a person responsible for their safety to ensure that they do not play with the appliance.

Working on roofs should always be considered a hazardous activity; by law you must observe certain minimum safety precautions. These safety precautions are outlined in the Work Cover Code of practice "Safe work on roofs" Part 1 and 2 and in the Occupation Health and Safety Act 2011.

1.4 Plumbing

- Ensure all parts used for connections are copper with no plastic.
- Hot and cold copper pipes to and from the collectors must be completely insulated with a suitably temperature rated insulation that is UV rated and weatherproof with minimum thickness of 19mm.

- The water pressure should not exceed 500Kpa.
- Valves and fittings supplied with this solar water heater form part of the installation and must be fitted in accordance with this manual.
- Non return valves should be fitted on the pump outlet side.

1.5 Electrical works

A 240V 50 Hz 10 Amp power outlet, connected to continuous tariff, is required for the pump and controller and must be installed by a licensed Electrician. This may be a weatherproof outlet depending on location.

1.6 Pressure Limiting Valve and Tempering Valve

A pressure limiting valve of 500kPa maximum must be fitted because normally the cold water mains pressure exceeds 500kPa. It must be able to release the pressure increase that occurs when the manifold stagnates and should be rated to meet the maximum possible heat output of the solar collector. Water tank and other application will be well protected by a pressure limiting valve.

Failure to install a pressure limiting valve will void the warranty.

All water heaters have the ability to produce hot water very quickly. To reduce the risk of scald injury it is recommended that a temperature control (tempering) valve be fitted to the hot water supply pipe work. This valve should be checked at regular intervals to ensure its operation and settings remain correct.

WARNING: SCALDING OCCURS AT 50°C. THIS APPLIANCE IS CAPABLE OF PRODUCING HOT WATER AT ABOVE THIS TEMPERATURE. A TEMPERING VALVE SHOULD BE INSTALLED AS PER YOUR LOCAL GOVERNMENT REQUIREMENTS.

A TEMPERING VALVE IS STRONGLY RECOMMEND TO BE INSTALLED.

1.7 Pressure Temperature Relief Valve (PTR valve)

A 850kPa and 99°C PTR valve is fitted on the Neopower storage tank. It is recommended that the lever on pressure & temperature relief valves (PTR) be operated once every 6 months to ensure reliable operation. **It is important to raise and lower the lever gently and be careful as the water released will be hot.**

The PTR valve is designed to allow small quantities of hot water to discharge during heating to allow for hot water expansion.

DANGER: Failure to operate the relief valve easing gear at least once every six months may result in the water heater exploding. Continuous leakage of water from the valve may indicate a problem with the water heater.

Also ensure that the pressure & temperature relief valve and relief pipe is not located where it can cause damage if hot water is discharged.

1.8 Water Quality

Town water supplies are generally a controlled water source and should not cause any difficulty with the system. Some water may have elevated mineral content and require more frequent system maintenance.

Water in direct flow through the solar hot water system must firstly meet potable water requirements and in addition the following:

Total dissolved solids	<600 p.p.m
Total hardness	<200 p.p.m
Total Chloride	<250 p.p.m
Free Chlorine	<5 p.p.m
Magnesium	<10 p.p.m
Calcium hardness	<200 p.p.m
Alkalinity	<150 p.p.m

If the water quality can't meet the above requirements, Neopower solar hot water will not be covered by the warranty.

In areas with hard water (Total hardness>200ppm), lime scale may form inside the solar collector. In such regions, it is advisable to install a water softening device to ensure the long term efficient operation of the collector.

Your local water supply authority can supply a water analysis if required.

1.9 Corrosion

Both copper and stainless steel are susceptible to corrosion when high concentrations of chloride are present. If any damaged by corrosion directly or indirectly, the solar collector isn't covered by the warranty. The solar collector may be used for heating of spa or pool water but levels of free chlorine must not exceed 5ppm.

THIS UNIT IS NOT SUITABLE FOR USE AS A POOL OR SPA HEATER

1.10 Freeze protection

Neopower split pumped systems are not suitable for installation where the ambient temperature falls below 4° C and/or above 800 meters altitude without additional frost protection – systems installed under these conditions suffering frost damage, will not be covered under warranty. Neopower Evacuated Tube systems are recommended for these sites.

If a Neopower split pumped system is to be installed in an area subject to freeze conditions, an approved frost protection valve **MUST** be fitted to protect against frost damage. Where more than 1 panel is installed a frost protection valve should be installed on each panel. Systems not fitted with an approved frost protection valve suffering frost damage will not be covered under warranty.

Neopower systems are fitted with an inbuilt frost protection mechanism in the solar control unit designed to automatically circulate a small amount of water through the solar collector array when freeze conditions occur. It is important to ensure that the power supply to the pump control unit is **NEVER** switched off during normal day to day operation. If you are unsure about the level of frost protection required in your area please contact your Neopower solar specialist on 1300 062 788. Neopower's warranty will not apply to frost damage collectors if the pump and or controller are determined to be faulty for any reason, including power failure except within the first 12 months.

It is the home owner's responsibility to check the system before winter to determine that the system is circulating water to the collectors. This can be done by checking temperature of the pressure relief valve on a sunny day in the late afternoon. If the valve is hot the pump and controller are working properly and this verifies that the frost protection will function correctly. Failing to perform this check will render the home owner liable for the full expense of collector replacement should frost damage result.

1.11 Wind Stress

When installing the collector, please consider the issue of wind resistance and the resultant stress on attachment points. The standard frame and frame kits are all designed to withstand wind speeds of up to 180km/h. It is the responsibility of the installer to ensure that the frame mounting is of suitable strength. For areas with the possibility of high winds, additional reinforcement of attachment points may be required and can easily be supplied by your local Neopower agent upon request.

1.12 Hail Resistance

It is recommended that your household insurance policy cover the collector glass and/or damage to the water heater, especially in cyclonic areas and in locations where hail in excess of 25 mm diameter is likely to occur. Damage such as this is not covered by warranty.

2 Installation

2.1 Storage Tank

2.1.1 Construction of water tank concrete base

External water tank concrete base is to be installed according with AS/ANZ 3500.4 clause 4.5.3. This is necessary to ensure that the metal base of water tank does not corrode; wet condition does not damage the Neopower polymeric casing which is corrosion proof. A base tray is optional and will provide uniform support. No extra weather protection is required for the Neopower water tank.

2.1.2 Operation Checking

The pressure & temperature relief valve (PTR valve) is designed to allow small quantities of hot water to discharge during heating to allow for hot water expansion. A safe drain tray should be provided where this is required.

The flow meter supplied in the pump station kit should be set to 1L/min on site with the appropriate speed setting to achieve this flow.

2.1.3 Clearance

Allow adequate room to work with tools. A minimum of 25mm clearance around the water heater is required. An additional 30mm is required for relief valve removal, 80mm for access cover removal and 400mm for element removal. You should be able to read the information on the rating plate and all informative labeling.

Adequate provision must be made to dispose of any water escaping from heater or adjacent plumbing that might result in damage to property. The water heater must be connected in such a way that:

- Space is allowed for the removal of the heating element.
- Space is allowed for the removal and replacement of the anode.
- The pump is accessible for servicing.
- Complete removal of the unit can be easily effected if necessary

2.1.4 Confined Space

If the thermostat fails the unit may produce excessive steam. It is strongly recommended that the heater should be installed in a well-ventilated space to avoid condensation build up. If installed in

confined areas, make provision for Service Access. Vent safely to open air and carry hot water overflow pipework to drain.

2.1.5 Electric Connection

Neopower water tank is designed for single phase 220-240V A.C supply only. The electric connection must comply with AS/NZS 3000. You can remove the electric cover easily after taking off 6 assemble screws.

Dangerous:

- a) Power supply must be cut off and the fuse should be taken off from switch board before removing the electric cover.
- b) Wire will be exposed after removing electric cover. So only the person who is licensed electrician is permitted to operate it.
- c) Children and disabled person are not permitted to operate the water tank alone.
- d) There must be some water in the water tank before turn on the power supply.
- e) Electric level of protection for water tank is design at IP34.
- f) Any operation for electric connection must comply with AS/NZS 3000.

2.1.6 Temperature Control

The temperature setting can be set from 60°C to 75°C per different season. Please note that only licensed plumber or electrician is permitted to set the temperature.

Booster setting: the booster is factory set to 60°C in the case of electric boost tanks and 75°C for Gas boosted systems The end user is not required to adjust the booster thermostat setting by any means, Adjustment of the booster should be carried out by a licence service technician.

2.1.7 Pipework, Valves and Fittings

Valves and fittings for connecting the solar panels on the roof and the storage tank are supplied. The temperature of the water at the outlet connection on the panels may reach 150° C or more and therefore only copper pipe can be used between the panels, storage tank and boosting heater.

Class B copper pipe should be used and the runs should be as short as possible to reduce heat losses. The pipes MUST be lagged using thickwalled foam of at least 19mm thickness, it should be weather proofed and UV stabilized.

If insulation is not UV stabilized, it must be protected by a suitable UV resistant paint. Pre-formed insulation gloves and cable ties are provided to insulate fittings. The areas to be insulated are: inlet pipework fittings to the panel, the outlet pipework fittings, and on 2 & 3 panel systems the joiners between the panels. These fittings must be insulated to protect them from freezing in cold areas. Warranty may be void if not fitted. Refer to the Solar Panel Layout drawings for location and installation detail. Water may drip from the pipe of the pressure-relief device. This pipe must be left

open to the atmosphere.

2.1.8 Raining and Flushing

To flush or to drain the Neopower water tank, power must be turned off and then the cold water supply to the water tank is to be turned off. The lever on the pressure & temperature relief valve should be opened but caution should be taken so the lever does not snap back as it could damage the valve seat. The pressure in the water tank will be released when the lever is opened.

The union at the tank drain outlet should be undone and a hose should be attached to the water tank side of the union. The other end of the hose should go to a drain.

Opening the pressure and temperature relief valve allows air into the water tank. Following complete draining of the water tank from the drain outlet, the closest hot water tap is to be opened fully and the PTR valve closed with caution. The cold water inlet stop valve is now opened fully and the water tank is filled with cold water and flushed through to ensure the cylinder contains no sediment and is clean. Finally the closest hot water tap is to be closed and power to be turned on again after thoroughly filling the water tank.

2.2 Solar Collector Installation

To achieve maximum solar performance, the solar collectors should be installed facing as close to North as possible. The following are guidelines for the installation of solar collectors:

- Solar collectors should be positioned to face the equator which is North facing in Australia. The further away from North, the greater the loss in solar efficiency.
- The inclination of the solar collectors should be within 10% either side of the local latitude angle.

For example, the latitude of Brisbane is 27° South so the inclination of the solar collectors should be approximately 24 to 30 degrees.

- Solar collectors should be free from shading by trees (should be checked regularly) or nearby buildings or other structures.

Note: If the above guidelines cannot be achieved, consideration should be given to increasing the solar collection area by adding an extra solar panel, particularly if the direction is further than 45° either side of North. In any case, no direction should be chosen that has any inclination towards South.

Note: the installation of the solar collector should not compromise the structural integrity of the building. The installer must consider the structural integrity on the building when installing the whole system.

2.2.1 Collector Plumbing Roof Mount Kit

The Neopower Plumbing Roof Mounting Kit is supplied with the solar collectors for installation when the collectors are installed. The kit does not include Frost Protection Valves as standard. The Frost Protection Kit is available as an accessory for use in frost prone areas.

2.2.2 Frost Protection Kits

Additional accessories available from Neopower include the Frost Valve Kit. These valves are required to be installed in frost prone areas or areas subject to freezing (below 5° C) and must be installed facing downwards (one per panel). The valve must not contact the roof.

During frosty conditions these valves open and allow a slow flow of water through the panels.

They will automatically close when the water temperature rises. They provide backup for the freeze protection facility on the controller in the event of power failure. **Do not use thread sealants to connect the frost valves; they must be fitted using the sealing washer supplied with the valve.**

2.3 Solar Controller and Pump Operation

2.3.1 Controller General Information

The Aestiva S1000 controller is differential controller specifically designed for forced circulation solar system. It incorporates a microprocessor driven PCB board and a set of highly engineered thermal sensors. The roof sensor is capable of operating under extremely high temperature.



The controller is user programmable with an access code and features intelligent self trouble shooting functions. Only authorized installers and technicians have access to the access code for reprogramming.

The circulation pump is activated when the roof sensor temperature reaches a predetermined temperature higher than that of the lower tank sensor port. The circulated water is then heated by the solar energy and then stored in the tank.

An antifreeze function is available when the roof temperature falls below a predetermined figure. A small amount of water is circulated to the roof and effectively prevents frost damage.

A manual pump operation is featured to allow user to temporarily turn on and off the devices by overriding the preset logic. However, the controller returns to auto mode after 2 hours in manual operation.

Each controller includes a built in self diagnosis detection and runs error checks continuously. An error message will indicate the specific damaged sensor wire that needs replacing. All LED indicator lights will flash to alarm the users.

The controller outer enclosure can be attached to either storage water tank or nearby wall. 4 mounting brackets are inbuilt in the controller enclosure. The controller can be fit onto a specially designed pump station or nearby wall by fixing the mounting brackets onto 4 mounting studs or screws heads.

Do not run sensor cables parallel to mains power cable and any additional wiring shall be coiled and shortened by qualified electricians.

Warning: The 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 must be supervised to ensure that they do not play with the appliance.

This controller appliance is prewired with temperature sensor wires, power supply wire and output wires. During Installation, the power supply cord must not be allowed to connect with the main electricity supply, until the controller is securely in place and with all output connections already connected.

2.3.2 Controller Functions and Default Controller Setting

The controller has the following default functions/settings from factory.

- **Circulation pump differential control** – The circulation pump will only be activated when there is sufficient solar energy present on the roof to contribute to the heat gain in the water cylinder. This is achieved by sensing the temperature difference between the roof collector and inlet water temperature. The water circulation will stop when the roof collector temperature falls and not sufficiently higher than the water cylinder inlet temperature.

“**Pump Differential On Temp**”: 8°C

“**Pump Differential Off Temp**”: 2°C

- **Top out protection** – In good solar conditions, the solar collector could harvest the solar energy extremely sufficiently and quickly raise the storage water cylinder temperature. The storage water cylinder internal lining may be damaged by the high temperature water, which can exceed the designed operating temperature range by the tank manufacturer. The top out function prevents the water cylinder reaching dangerously high temperature by stopping the pump circulation to the collector, so that the water is not heated further. A solar rated high temperature non-return valve must be used in the solar loop in conjunction for maximum protection.

“**Top Out Temp**”: 70°C

“**Top Out Reset Temp**”: 68°C

- **Anti-freeze protection** – In frost conditions, the risers in flat plate collector may freeze and cause damages. Anti-freeze protection can sense the roof temperature and activate the pump circulation for short period before the water may freeze inside.

“Anti-freeze on Temp”: 3°C

“Anti-freeze on Temp”: 5°C

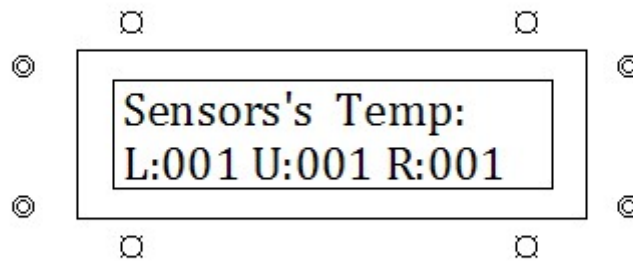
- **Manual pump function** – During installation of the solar systems, a manually operated solar loop circulation is needed to help bleed the air and test if the solar loop is working without blockage. Push the “manual pump” button and the controller will enter a manual mode. In this mode, the pump will pump disregarding other control functions. The manual pump mode can be turned off by pressing the “manual pump” button again and the controller re-enters the automatic mode. In case that the user forgets to exit manual mode, the controller will automatically re-engages automatic mode after maximum of 2 hours.
- **Auto cavitation recovery** – In case of drop of water pressure, air bubble may form and trapped inside the circulation pump chamber. This can cause cavitation and blocked solar loop. When the pump has continued working non-stop for 2 hours (a sign of cavitation forming), the auto cavitation recovery function will turn off the pump for 2 minutes and allow the air bubble to escape. When the pump is re-engaged, the cavitation should be recovered in most situations.

2.3.3 Controller Basic Operation

The controller control interface consists of 4 buttons and 4 indicator lights and a white back lit LCD screen.



The controller is in automatic mode with the factory settings when it is turned on first. The screen will display all 3 sensors' temperatures as below.



By pressing Manual pump button, the controller can be switched into manual mode. Other 3 buttons are only used during program mode, which requires an excess code from authorized personnel.

During the program mode, using “Next” button, the controller will go through the following setting menus:

Pump On Temp:
008

Pump Off Temp:
002

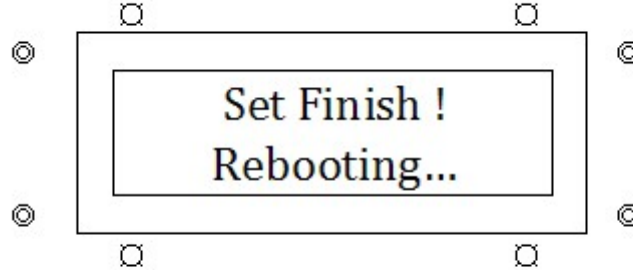
Top Out Temp:
075

Protect On Temp:
003

Protect Off Temp:
005

Using “+” and “—“ buttons, the setting parameters can be increased and decreased. By holding the

“program” button, the programming will be finished and the controller will reboot itself with the following prompt:

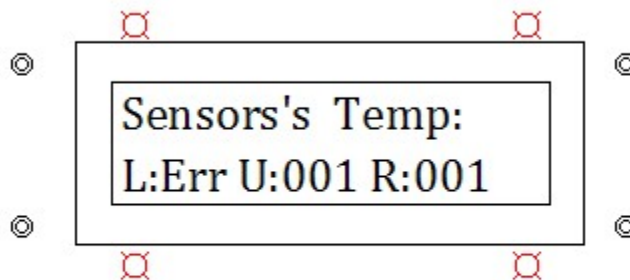


2.3.4 Error messages and trouble shooting

2.3.4.1 Faulty Sensors errors

Aestiva controller can check faults on faulty sensor itself. The solar loop operation will be stopped when a sensor error occurs.

When one or more sensors are faulty, all 4 LED lights flash. The lower sensor display window displays “Err”. If other sensors are faulty, the “Err” message will appear after the corresponding sensor on the screen.



Trouble shoot: Check the sensor cables casing condition or gently pull the cable from the controller to check for the connection with the terminals. If none works, please call up your installer for cable replacement. Do not run the sensor cable along any AC wires, as interference may be caused.

2.3.4.2 Manual pump not working

Trouble shoot: Check the top tank temperature first by reading the controller screen. If the top out temperature has been reached, the controller will not allow the pump to manually operate to protect the tank.

2.3.4.3 The screen is blacked out

Trouble shoot: Check for power supply first. Then the controller may be hit by a surge. The controller may be opened and the fuse should be replaced. This is best to be performed by an approved electrician.

2.3.5 Mounting of the controller

The back of the controller feature 4 bolt holders, in which the bolt's head can slide up and down into and out of the controller.

The location of these 4 holes is printed in the supplied paper, which can be used for bolt drilling reference.

Once the bolts are in place, the controller can be readily slide onto the bolts for mounting without any tools.

The instructions for mounting the controller into the pump station housing are given in section 1.6.

2.3.6 Sensor Mode Switch

Unless specified by customers prior, all S1000 controllers will come equipped with 3 sensor wires.

If only 1 sensor is desired for the tank, the controller features an inbuilt automatic sensor mode switch function.

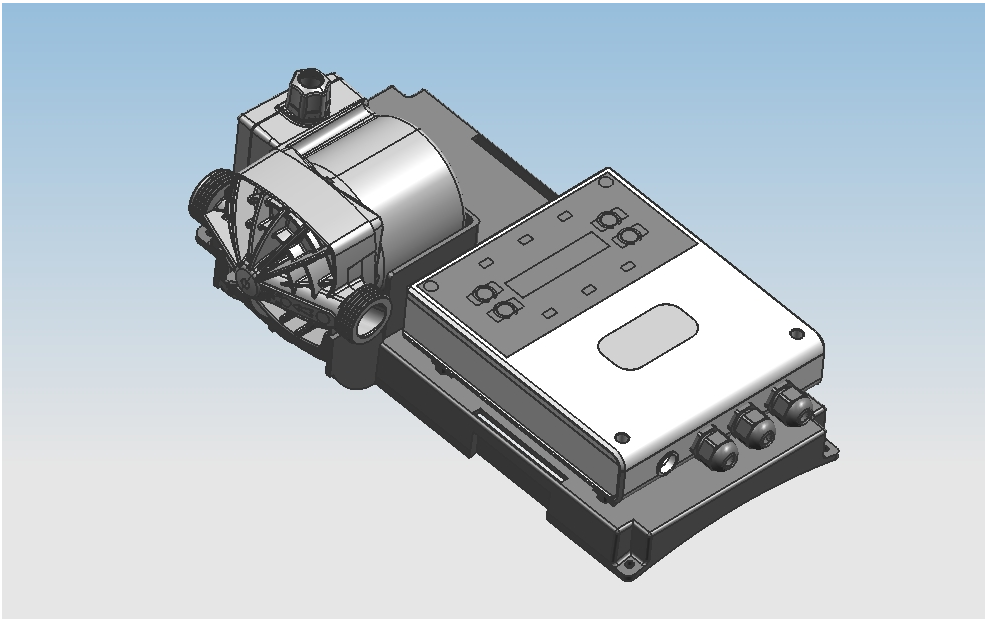
When the tank upper sensor is disconnected or removed, the "U" temperature display will appear blank on the screen and no error message will result. In this setting, the top out protection setting will be applied to the bottom sensor instead.

This function also acts as a further fault proof function, in situations where the tank upper sensor becomes faulty. The software will automatically switch into 1 tank sensor mode, while still ensuring the operation of the whole solar system before the repair can be carried out.

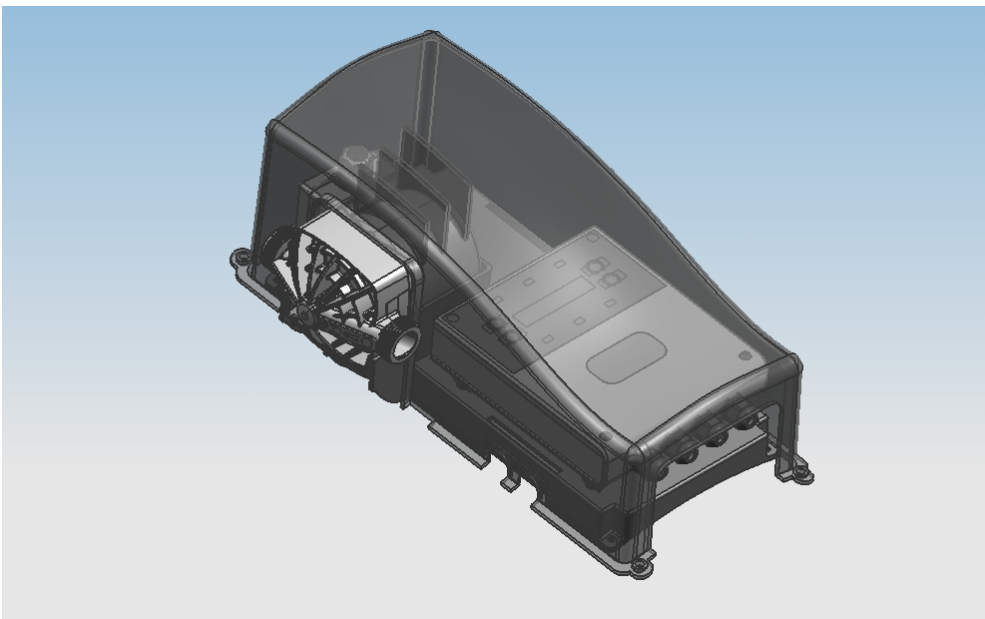
2.3.7 Optional Pump Station

Aestiva supplies a matching pump station for the S series controller. The pump station features fully Australian complied Watermarked brass wares, valves and fittings and a high quality Grundfos solar pump. The outer casing is injection molded with UV additives to withstand Australian Outdoor conditions.

The pump and controller can be mounted onto the pump station base without the aid of any tools as per below.



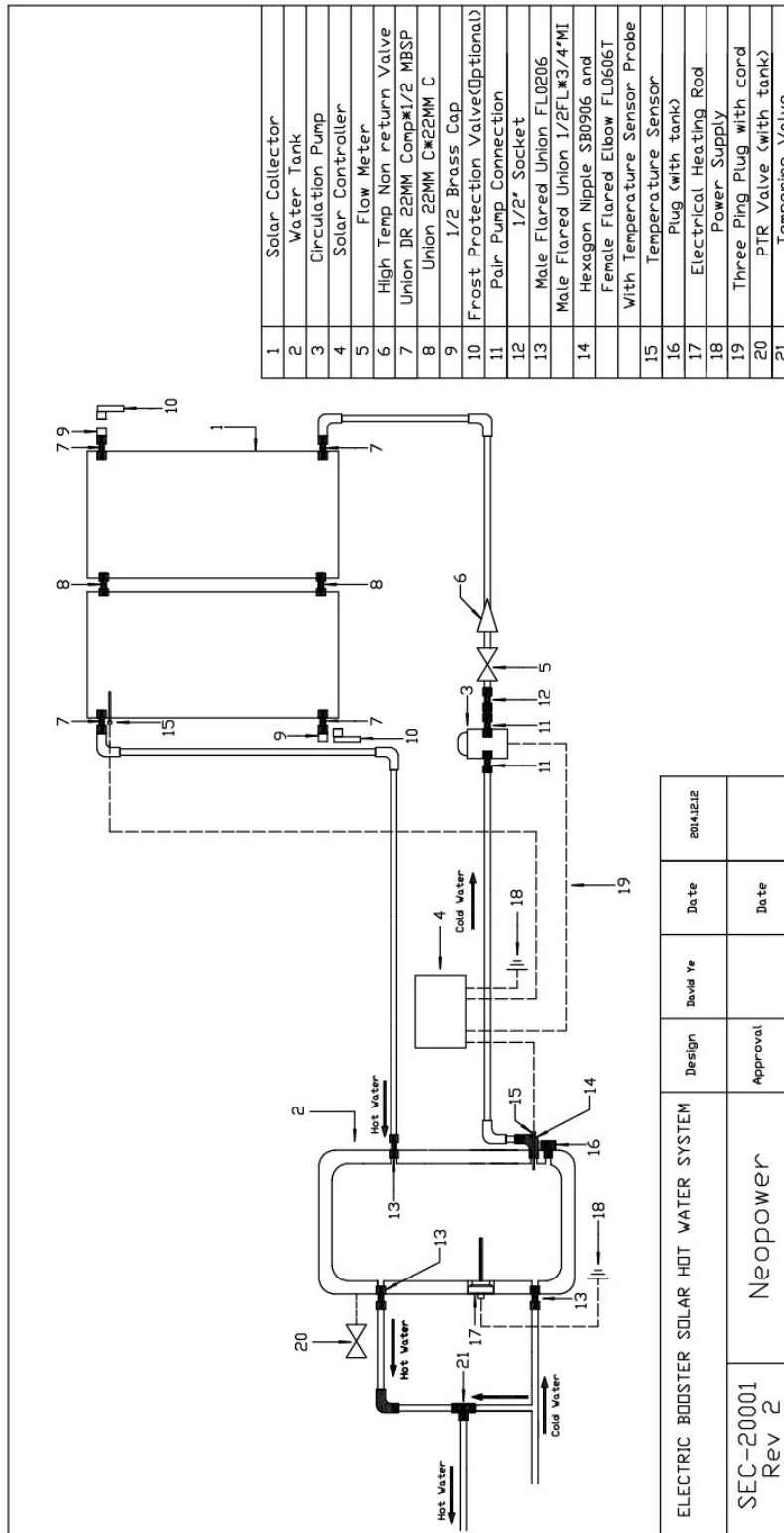
The pump is further locked into place by the in mould pump station cover.



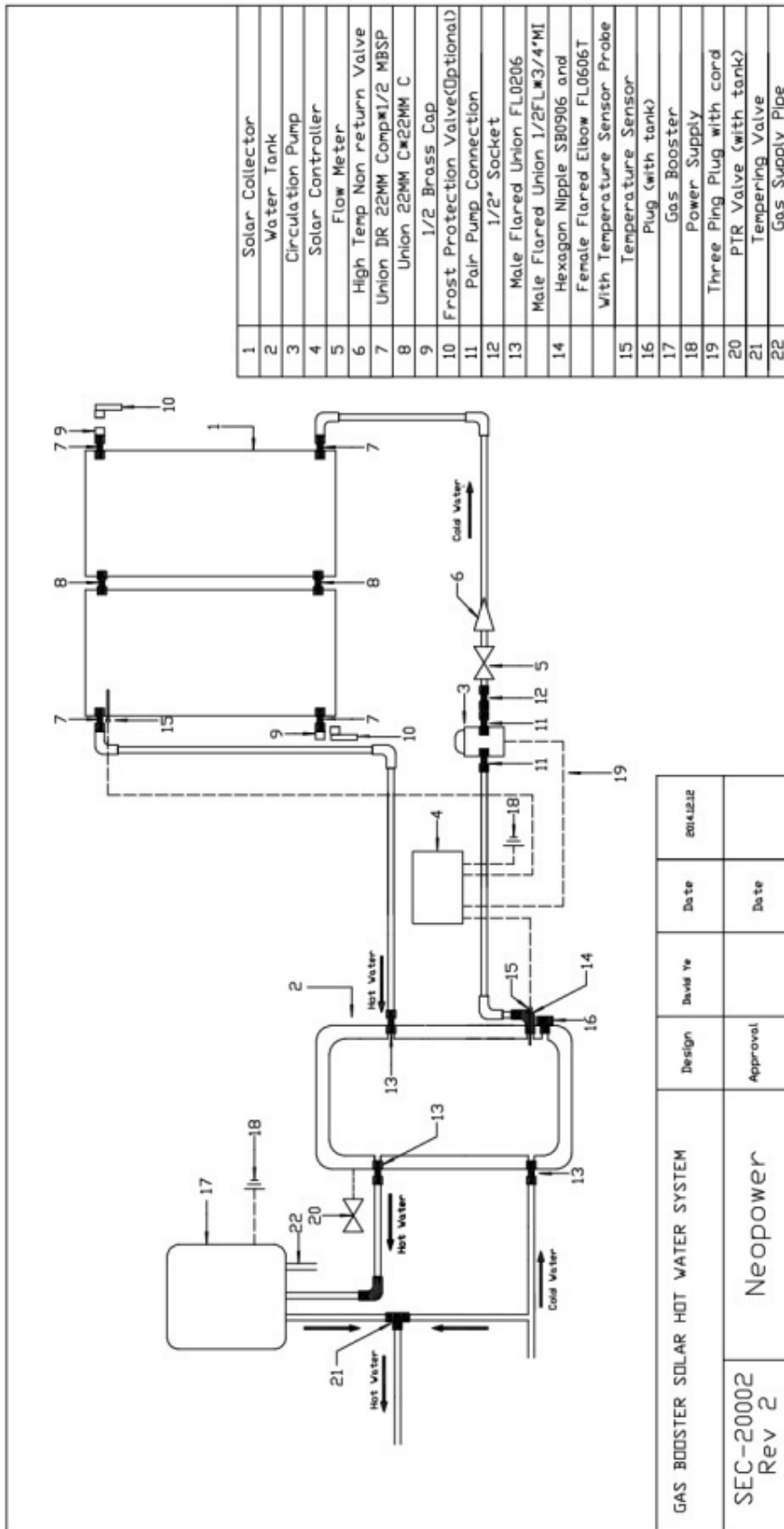
Using supplied screws and bolts, the pump station is readily bolted onto the water cylinder tank or onto the building's wall. Only the pump station base is used during mounting. The holes on the top cover are reserved for occasions where added security is required to bolt down the top cover to the surface.

2.4 Neopower System Schematic

2.4.1 Electrical booster solar hot water system



2.4.2 Gas booster solar hot water system



2.5 Gas Connection and Gas Piping (gas booster system)

The Neopower gas booster solar hot water system incorporates a Booster. Please see the Installation Guide come with the unit for detail information such as material, safety requirements, gas piping, installation of gas piping, application installation and commissioning.

The gas booster can be mounted either on an adjacent wall or on the front of the Neopower gas storage tank using an optimal mounting bracket. This bracket connects to the front of the tank via four bolts and allows the gas booster to hang on the bracket after the gas booster has had its top mounting bracket reversed.

2.6 Start-Up Procedure

- 1) Fill the water heater by opening all hot water taps and operating the cold water inlet to allow the heater to fill up and air in the system to be expelled. Close each hot water tap, as the flow becomes free of air.
- 2) Check the pipe connection for leaks.
- 3) After verifying the system to be leak free, turn the pump and controller on at the power outlet. Correct controller operation can be determined after the solar collector have been installed, or by chilling tank sensor with ice blocks.
- 4) Gas supply and power to the gas booster may be turned on and the unit checked for the presence of leaks. The gas boosted operation of the heater should be checked.

3 Maintenance

3.1 Pressure and Temperature Relief Valve (PTR valve)

An 850kPa and 99°C PTR valve is used in Neopower water tank, which is located on the side of the water tank and is essential for its safe operation. We recommend you operate the easing lever on the PTR valve once every 6 months. It is important you raise and lower the lever gently. The PTR valve is designed to allow small quantities of hot water to discharge during heating to allow for hot water expansion. The PTR valve discharge should be directed away by a downwards oriented discharge pipe which is protected from possible frost restriction. This pipe must be left open to air and properly located in case of being blocked. The diameter of this pipe should not be less than 15mm (1/2").

Neopower recommends that a 500kPa pressure limiting valve to be fitted at time of installation. The valve should be installed in the cold water inlet piping.

This valve should be checked at regular intervals to ensure its operation and settings remain correct. Also ensure that the pressure & temperature relief valve and relief pipe is not located where it can cause damage if hot water is discharged.

3.2 Replace the anode

It is recommended that check and replace the anode to be carried out by your local Neopower agents

Anode replacement

- 1) Turn off the power supply
- 2) Turn off the cold water supply
- 3) Open PTR valve to release the pressure
- 4) Take off the anode cover at the top of tank
- 5) Unscrew the screw of the anode
- 6) Take off the anode bar
- 7) Reinstall anode as backward process

THE ANODE MUST BE REPLACED AT LEAST EVERY 5 YEARS. AT SOME AREA WITH BAD WATER QUALITY, THE ANODE MIGHT BE REPLACED EVERY 2-3 YEARS.

WARNING:

IF THE HOT WATER SYSTEM IS NOT USED FOR TWO WEEKS OR MORE, A QUANTITY OF HIGHLY FLAMMABLE HYDROGEN GAS MAY ACCUMULATE IN THE WATER HEATER. TO DISSIPATE THIS GAS SAFELY, IT IS RECOMMENDED THAT A HOT TAP BE TURNED ON FOR SEVERAL MINUTES OR UNTIL DISCHARGE OF GAS CEASES. USE A SINK, BASIN, OR BATH OUTLET, BUT NOT A DISHWASHER,

CLOTHES WASHER, OR OTHER APPLIANCE. DURING THIS PROCEDURE, THERE MUST BE NO SMOKING, OPEN FLAME, OR ANY ELECTRICAL APPLIANCE OPERATING NEARBY. IF HYDROGEN IS DISCHARGED THROUGH THE TAP, IT WILL PROBABLY MAKE AN UNUSUAL SOUND AS WITH AIR ESCAPING.

3.3 Cleaning

Regular rain should keep the solar collector clean, but if particularly dirty remains then it may be washed with a soft cloth and warm soapy water or glass cleaning solution. If the collectors are not easily and safely accessible, high pressure water spray is also effective.

3.4 Insulation

The plumbing pipe insulation foam should be checked annually for damage. If available, UV stabilized foam should be used, otherwise deterioration can occur overtime.

Note: Up to 60% heat loss can occur if the insulation is non-existent or sub standard. Therefore please pay particular attention to making sure the system is properly insulated and any external insulation is UV protected.

3.5 Tempering valve

The tempering valve controls the temperature of the hot water entering the residence form the storage tank to a maximum of 50° C. AS/NZS 3500.4:2003 details the requirements of the valve.

The reduce the risk of scalding, a tempering valve as detailed in AS/NZS 3500.4:2003 must be installed into the hot water supply line incorporating all sanitary household hot water outlets such as bathrooms, en-suites and washbasins. The tempering valve to be used for solar hot water systems must be a solar rated valve. These valves have been specifically designed to work with the higher temperatures that solar hot water systems can produce.

Note: Tempering valves should be checked every year for correct temperature delivery and they should be replaced every five years.

3.6 Flow meter (flow control valve)

The water flow meter (flow control valve) is an in-line valve that is mounted immediately after the pump and controls the flow rate of water to the collector. The valve has direction arrows showing the direction of water flow. Ensure the direction of flow of water for the water meter and the pump are

matched.

The flow rate can be set using a screwdriver once the pump is on and the water flowing. Set the bottom of the red float as the flow rate level in below table.

The flow meter supplied in the pump station kit should be set to 1L/min on site with the appropriate speed setting to achieve this flow.

4 Troubleshooting

4.1 No Hot Water

If there is no water, it will generally be related to the gas or electric heating system but not the solar collector. (The solar collector pre-heats water, with final boosting completed by the electric element or gas booster system.) Please contact your local Neopower agent.

If the gas booster is not turned on before sending water through it then it will default to 75°C. To reset the system turn the gas booster off via the power point or taking the plug out of the controller and wait two minutes before turning the system back on.

4.2 Reduced Solar Contribution

Solar contribution to your heating is directly related to the amount of solar radiation and the volume of hot water used. During the winter and the periods of rainy or particularly overcast weather, the amount of energy produced by the solar collector will be greatly reduced.

As a general rule, the solar collector will have been sized to provide close to 100% of your summer hot water needs, which depending on your location, angle of collector and hot water usage patterns, may result in up to 80% or more of your annual hot water energy needs. During the winter, due to increased cloud cover and reduced solar radiation levels, solar contribution may be as low as 50%. This is normal. If given similar environmental conditions, you feel that the solar contribution has considerably reduced there may be a problem with your solar heating system. This may be due to an incorrectly configured or damaged controller, pump malfunction or problem with the boosting system. In such cases please contact your Neopower agent.

- 1) Does the circulation pump appear to be operating? In good sunny weather the circulation pump should come on as can be seen by the “PUMP” light on the controller. The pump may run very quietly and so you may need to touch the pump or piping running to and from it to feel for motor running.
- 2) Are there any apparent leaks in the plumbing to and from the collector? Any water trails down the roof or around the storage tank? Have installer tighten fittings when necessary.

4.3 Regular Releasing of Hot Water

If during normal daily hot water use, the PTR valve on the tank is regularly releasing hot water, it indicates there may be a problem. However releasing a few liters a day is normal.

Possible Causes

- 1) A problem exists with the electric heating thermostat.
Solution: Contact your Neopower agent

- 2) Incorrect, faulty or missing Pressure Limiting Valve
Solution: Contact your Neopower agent

Note: If the PTR valve is less than one year old then it is covered under warranty.

To test the system, run the hot water tap in the bathroom or kitchen for five minutes to release some heat from the system (the water will be hot so be careful). If after this period, the tank is still regularly releasing hot water it indicated a definite problem. Please contact your local Neopower agent.

4.4 Safety Precautions

For any problems that involve plumbing or electrical connections, a qualified professional must be employed.

Should you have any questions regarding the Neopower Solar Hot Water System, contact your local Neopower agent.

5 Water Heater Manufacturer's Warranty

This warranty is provided by Imaca Pty Ltd (Neopower). It applies to Neopower Flat Panel Solar Hot Water Heaters installed in a single family dwelling only and is provided only to those acquiring the water heaters as consumers within the meaning of the Australian Consumer Law. The terms of the warranty are effective from the date the water heater is installed. Neopower may verify this date by requesting a copy of the compliance certificate that accompanied the installation. The compliance certificate is mandatory in all Australian states and territories.

Water in direct flow through the solar hot water system must firstly meet potable water requirements and in addition the following:

Total dissolved solids	<600 p.p.m
Total hardness	<200 p.p.m
Total Chloride	<250 p.p.m
Free Chlorine	<5 p.p.m
Magnesium	<10 p.p.m
Calcium hardness	<200 p.p.m
Alkalinity	<150 p.p.m

If the water quality can't meet the above requirements, Neopower solar hot water will not be covered by the warranty.

Imaca Pty Ltd is responsible for reasonable costs associated with legitimate warranty claims, including call-out of an authorised Neopower service provider to inspect the faulty product. Imaca Pty Ltd is not responsible for:

- (a) costs for tradespeople that are not authorised Neopower service providers; or
- (b) any costs, including call-out costs for an authorized Neopower service provider, associated with a product which is determined upon inspection not to be covered by this warranty.

Any inspection, service, repair or replacement activities associated with warranty on Neopower products must be authorised by Imaca Pty Ltd before commencement.

Where the appliance has not been sited in accordance with the installation instructions or installed such that normal service access is difficult, a service charge will apply. If at the discretion of the attending service person, access is deemed dangerous, service will be refused. Any work required to gain reasonable access to the appliance will be chargeable by the attending service person (for example, removal of cupboards, doors, walls, or the use of special equipment to move components to floor level, but not limited to these).

Where a failed component is replaced under warranty, the balance of the original appliance warranty will remain effective. The replacement part or appliance does not carry a new warranty.

Warranty periods

Neopower warrants that the following water heater components will remain free of defects for the specified periods from the date of installation:

Item	Warranty Period –Parts Only (year)	Warranty Period –Parts and Labour (year)
Storage Tank Cylinders (Enamel)	7	1
Flat Plate Solar Collectors	7	1
Gas Booster (Heat Exchanger)	10	3
Gas Booster (Parts)	3	3
Electric Element	1	1
Grundfos Circulation Pump	1	1
Solar Controller	1	1
Parts	1	1

- To the extent a claim falls under the ‘Parts Only’ Warranty Period the Warranty covers the repair and/or replacement of such failed component in the Neopower Solar Hot Water Heating System free of charge. However, the transport, installation and labour costs of repairing the component or delivering the replacement component and removing and replacing the existing component will be the responsibility of the Customer of the existing Neopower Solar Hot Water Heating System.
- All other components supplied by Neopower, including valves, elements, thermostats and sacrificial anodes include 1 year parts & labour .
- Neopower gives no warranty in relation to components not supplied by Neopower, for example tempering valves and cold water valve assemblies used by installers.

Subject to the conditions and exclusions specified in this warranty, Neopower will at its own expense repair or replace any defective water heater component covered by this warranty as soon as reasonably practicable after the consumer has reported the defect to Neopower.

Procedure to make a claim under the warranty

Upon discovering a suspected defect, consumers should immediately report the suspected defect:

- to the installer or supplier, if the suspected defect arises as a result of the installation of the water heater or relates to any components not covered by this warranty.
- to Neopower on the phone number 1300 062 788 or email address: info@neopower.com.au during the relevant warranty period, if the suspected defect relates to any components covered by this warranty.

Specific exclusions

The above is subject to an area within a 50 kilometre radius of the Neopower Distributor or Branch from where the unit was purchased. Customers outside this area will be subject to any freight costs and any travelling charges incurred by the Neopower representative carrying out rectification work.

An ‘after hours’ service fee will apply to warranty calls made outside of normal business hours.

For warranty purposes, typical business hours are classified as the hours from 8.00AM to 5.00PM Monday to Friday (excluding public holidays).

To the extent permitted by law Neopower does not accept liability under this warranty:

1. If any component of the water heater has been installed, repaired, repositioned or modified by a person other than an appropriately qualified person approved by Neopower in accordance with Neopower's installation and maintenance instructions and relevant local and statutory requirements;
2. For loss or damage caused by a fault or defect in the installation of the water heater;
3. If there is damage to the collector by hail or other means;
4. If corrosion has occurred because the anode has not been changed in accordance with the owner's manual;
5. If a cold water expansion valve, check valve and strainer is not fitted in areas where mains pressure is likely to exceed 500 kPa;
6. For any damage arising as a result of an accident, act of god or other circumstances beyond Neopower's control;
7. For frost damage to Neopower open loop solar water heaters when installed in a frost prone area without approved frost protection valve(s);
8. For frost damage to Neopower solar water heaters due to temperatures below -5° c, Climate information on the Commonwealth Bureau of Meteorology website (<http://www.bom.gov.au>) contains historical minimum temperature data and will be used by Imaca Pty Ltd to confirm the cause of failure.;
9. For frost damage to Neopower solar water heaters where a failure of the pump, control system or power supply results in the in-built frost protection system being unable to operate when required;
10. For components not supplied by Neopower that are used in the installation of Neopower solar water heaters eg. Tempering valves, cold water valve assemblies, etc.
11. For extended or implied warranties not formally provided by Neopower;
12. For external labour or equipment costs (eg. Cranes and lifting devices) required for repairs;
13. For costs incurred for rectifying faults (or perceived faults) not directly attributed to the Neopower solar water heater;
14. For travel costs of service agents that exceed 50 kilometres;
15. For all consequential loss or damage arising from defects that can lawfully be excluded;
16. For any other issues not directly attributable to defects in components supplied by Neopower including:
 - a. damage caused by incorrect commissioning;
 - b. leakage from valves not supplied by Neopower;
 - c. leakage from the pressure temperature relief valve where the water pressure or temperature exceeds the limits specified in Neopower's installation and maintenance instructions;
 - d. water hammer;
 - e. external rust on the storage tank;
 - f. insufficient hot water because:
 - i. the consumer refuses to use the auxiliary booster;
 - ii. of an incorrectly set or faulty tempering or mixing valve;
 - iii. of faulty or incomplete installation;
 - iv. the water heater is too small for its required purpose;

- v. of insufficient water flow as a result of “water saving” tap-ware or appliances (for gas water heaters only);
- vi. of undersized gas lines (for gas water heaters only);
- vii. of blown fuses, “tripped” electrical switches or inadequate household electrical wiring;
- viii. of incorrect selection of gas type (gas water heaters only); or
- ix. insufficient water flow caused by debris accumulating in water strainer (gas water heaters only)

VIC, NSW and ACT Only

For all installations the following ‘fit for purpose’ conditions apply:

1. No warranty against damage caused by frost or freezing on any solar system in Alpine areas shown in Table
2. Any damage caused by frost or freezing of Neopower solar systems in these areas is at ‘own risk’.

Table 1

List of Alpine areas that have no warranty for damage caused by frost or freezing

Alpine Areas - VIC	Alpine Areas – NSW/ACT
Bogong	Charlotte Pass
Falls Creek	Mt Selwyn
Mount Buffalo	Mt Kosciusko
Mount Buller	Perisher Blue
Mount Hotham	Thredbo
Mt Baw Baw	
Lake Mountain	

VICTORIA ONLY

No warranty against damage caused by frost or freezing on Neopower flat panel solar system in below list of Victorian Postcodes. Note: Alpine areas listed in Table 1 are excluded from this table.

3289	3293-3302	3314	3345-3361
3373-3379	3407	3430-3442	3446-3464
3480	3607-3620	3629-3644	3666
3676-3687	3697-3699	3708-3715	3719-3749
3858	3862	3885	3888
3890	3893-3900		

NSW & ACT ONLY

No warranty against damage caused by frost or freezing on Neopower flat panel solar system in below list of NSW and ACT Postcodes. Note: Alpine areas listed in Table 1 are excluded from this table.

2325-2326	2328	2333	2336-2355
2358-2372	2380-2382	2397	2403-2404
2474-2476	2575-2633	2649-2655	2661
2672	2720-2722	2726-2730	2753-2755
2776-2821	2843-2868	2871-2872	2900-2914
4377	4385		

IMPORTANT NOTE

The benefits conferred by this warranty are in addition to any other rights and remedies available to the consumer under a law in relation to the goods or services to which the warranty relates.

Neopower's goods come with guarantees that cannot be excluded under the Australian Consumer Law.

Consumers are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. Consumers are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.