



Owners Manual

Sunshine Solar Evacuated Tube Water Heating System



Congratulations on choosing a Sunshine Solar water heater. You will find them virtually maintenance free and exceptional in heating your water. Please follow the guidelines on the care of your system to give you years of free solar hot water.

In this owners manual you will find:

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Warranty

This is to certify that Sunshine Solar provide a limited manufactures warrantee on their products. The solar tubes are supplied with a ten year warrantee from date of purchase against faulty materials. Two years on the pump and controller against manufacturing defects. This warranty does not cover frost damage, poor water quality, over temperature, over pressurization, abuse or general wear and tear and is replicated to the purchaser as supplied to Advanced Solar Technologies Limited by their suppliers with no increase or extension of coverage offered or implied. The installation must have been installed as per the latest Sunshine Solar installation instructions by an approved installer or assessed by an assessor as nominated by Advanced Solar technologies Limited and have been maintained as per our maintenance schedule by the same. All other parts supplied are provided with a 12 month warranty against faulty materials and workmanship. These warranties are replicated to the purchaser as supplied to Advanced Solar Technologies Limited by their suppliers.

Your plumber should also carry a 12 month warrantee against faulty workmanship and installation equipment. If you have any concerns at first instance contact your installer.

Note: A copy of this completed warranty is required along with a copy of your purchase agreement, for validation purposes.

Customer name: Address: Phone: Date of purchase: Date of installation:	Supplier: <i>Advanced Solar Technologies</i> Collector No: <i>ET__</i> Controller serial No: Notes:
Name of Installer: Company: Address: Phone: Date:	Name of Electrician: Company: Address: Phone: Date:

Important customer checklist

- Ensure Warrantee details are complete
- Complete and **send** in EECA Subsidy form (if applicable)
 - sign, include customer details and bank deposit slip
- Book council inspection (post installation) to get consent signed off
 - council phone number with consent material
- Keep all documentation together and on site for inspection

Important installer checklist

Please ask customer to be available at the end of the day/estimated completion time for commissioning and to go through the paperwork.

Otherwise this can be discussed by phone or if another appointment is necessary a call out fee may be applied.

Important Checks

- Check for leaks
- Ensure probes have good contact
- Ensure pump works
- Check heating element switches on and off
- Controller programmed
- System debrief with customer and review controller settings
- Clean up the site from boxes, wires, etc.

Important Paperwork

- Complete Code of Compliance for council
- Fill out EECA Grant Claim form and go through with customer
- Complete warrantee details in Owners Manual
- Leave system manuals for customer
- Electrical CoC form left with customer documents

If commissioning is not possible because the customer is absent please leave your contact details to make another time or discuss via a phone call.

Installation instructions

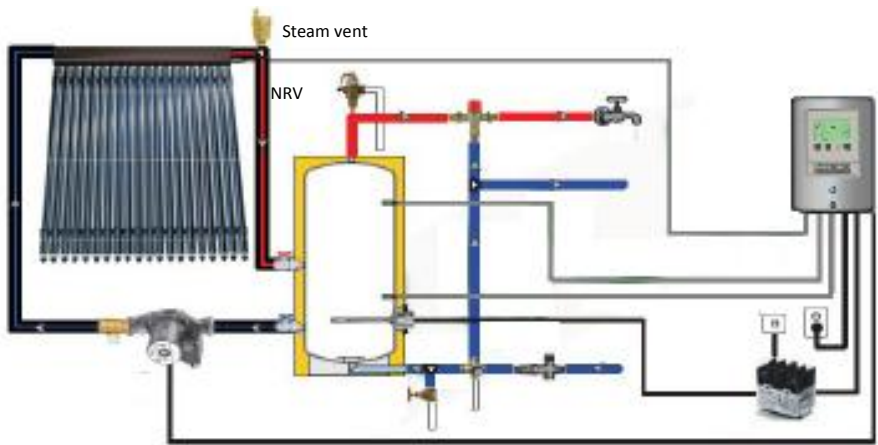
Dear Installer,

Thank you for choosing a Sunshine Solar water heater. We hope you found the installation of the Sunshine Solar equipment trouble free.

If you have any questions please call us on our toll free number 0800 786 744 or direct to Technical advice on 027 483 0936. (John). For more information please also visit our website www.sunshinesolar.co.nz.

System diagram

Mains pressure open loop



Commissioning with Customer

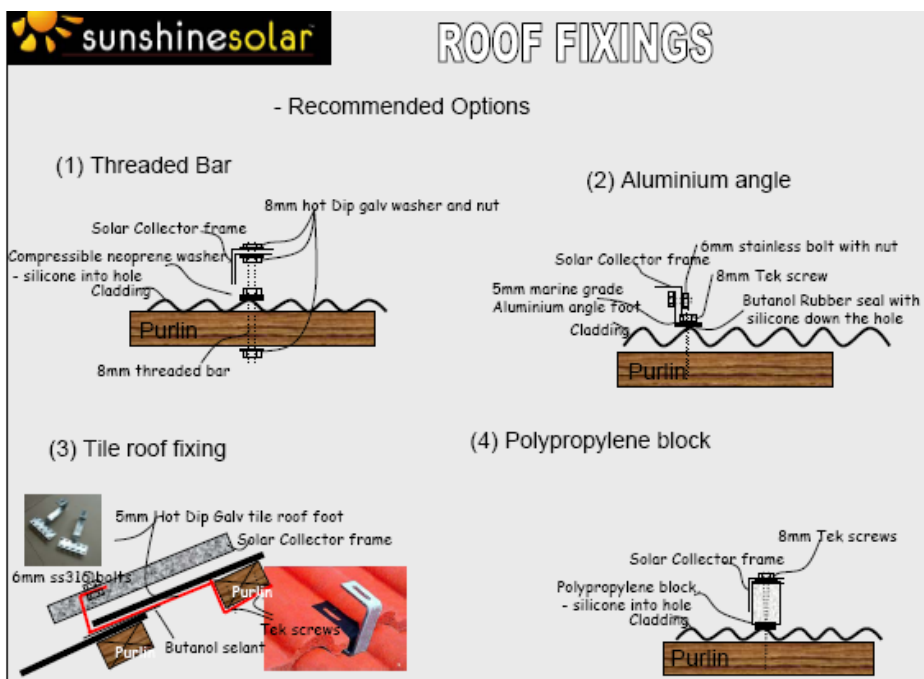
Please ask customer to be available at the end of the day/estimated completion time for commissioning and to go through the paperwork.

Otherwise this can be discussed by phone or if another appointment is necessary a call out fee may be applied.

I Solar unit

- Put frame(s) and potentially stand(s) together.
- Alter vertical frame part to match high roof points .
- Mount on roof as per fixing detail page.
- Connect steam / air vent valve.
- Run pipe and thermocouple wire T1 through roof, use dektite high temperature flashings to seal, see details attached.
- Insert the T1 so that only the metal is touching the copper and tape or cable tie in place.

Note: Insulation is not to run through the dektite.

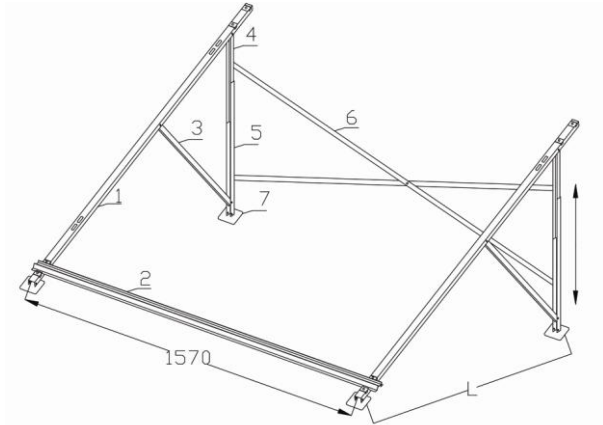


Installation methods

Roof stands

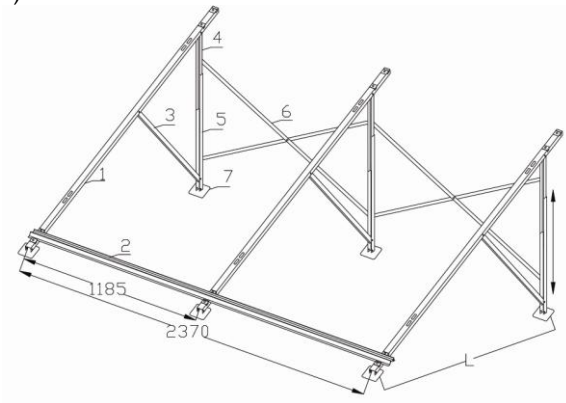
Adjust to alter collector height

- 1. Front track.
- 2. Bottom track.
- 3. Side supports.
- 4. Back stands upper bar.
- 5. Back stands lower bar.
- 6. X back supports
- 7. Feet



Adjustable angle range:

- 26°(L=1650mm),
- 34°(L=1545mm),
- 37°(L=1469mm),
- 42°(L=1381mm),
- 46°(L=1278mm).



Roof stand



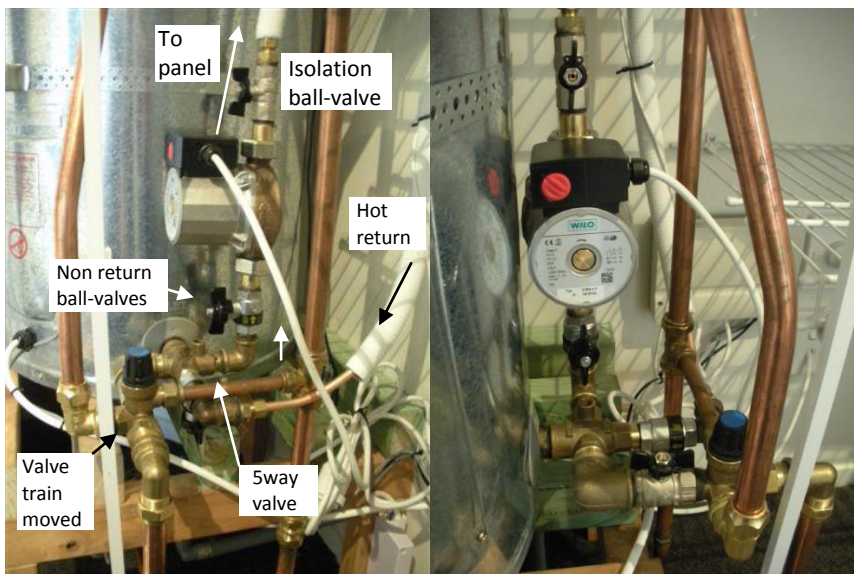
Tile roof bracket



Tile roof

2 Cylinder

- For a new install – please follow NZS3606 installation guide, ensure there is room for thermostat and relief valves have sufficient room for maintenance and potential removal.
- RETROFIT Turn off and unplug / disconnect cylinder.
- Drain cylinder.
- Add riser to return end of 4-way valve (retrofit).
- Connect 4 way valve.
- Connect and close ball valve, non-return valve and pump to the cold side of the cylinder, see diagram.
- Ensure the pump has enough support and is installed in a vertical position accessible for replacement and adjustment of settings.
- Connect Tempering valve if required to hot and cold sources on cylinder hot supply as per standard.
- Connect and close ball valves.
- Fill cylinder and turn on.
- Connect pipes from roof .
- Open ball valves.
- System to be installed to the following plumbing standards, ASNZS3500.4, G12 of building code, copper to NZS3501.
- **Ensure all pipes out of cylinder are lagged!**



4 Finishing off

- Purge pipe and pump of air.
- Set the pump speed (I for <30 tubes, III <50tubes).
- Pressure test for leaks by opening to operating pressure and running the pump.
- Install tubes into manifold use the white heat transfer paste supplied.
- Fit exterior insulation – so that no bare copper or brass is showing.
- UV protect the insulation if not already protected by using PVC tape.
- Program the controller. Full description for setup options and maintenance given in the controller manual supplied.
- Debrief and review settlings with customer.
- Fill out EECA paper work, CoC's and PS3's for council.
- Clean up the site from boxes, wires, etc.
- Complete Installer Checklist.



Other potential install techniques:

Element with hot return from cylinder:

This option makes it easier to attach to a cylinder where you cannot easily get to the cold inlet. It also saves on buying a 4 way valve and does not restrict the cold inlet pressure. Available in 2 and 3 kW.



Setting up the controller

SR868C8Q (pg10&11 of manual are most helpful).

- Set time using the time and date button.
- Press the SET button and a Password will come up, set this to 0000 by pressing the SET button. This will take you into a menu screen DT0. , press Set and then '+' to make this 15C, press esc.
- Heating using the dtf 8c controller through a relay.
- (nb if you are using a solar cylinder then normally do not use this function but connect top element directly to the mains supply).
- Press "+" 2 times until you get to THET. This is the timing function for the heating.
- Typical settings are: [Not required for Peter Cocks solar ready cylinders]
 - "ON" at 16:00, OFF at 23:00 to 60 °C, ON at 01:00 60 °C and "OFF" at 07:00, and leave the timing ON and "OFF" at 10:00 for the third setting. NB the default is 40°C and not long enough.
- Press the "ESC" button until back at THET then press "+" to get to the TEMP menu. Press "SET" to get into the TEMP menu then "+" to set the following settings.
 - EMOF – press SET so that you get "___" showing (this means this function is off).
 - EMON , CMX, CMN – "___" ie OFF.
 - CFR – frost protection set to 2°C.
 - SMX – maximum tank temperature SET to 80°C for retrofit cylinders or "___" for solar or wetback cylinders.
 - All other functions should normally be off "___".

Pressing 'ESC' will take you back one setting and will not lose the stored data.

Press "SET" to take you to FUN (Functions) menu, press "+" until you get to "nMin" press "SET" then "-" till you get to 100%. Press ESC 3 times to escape out of setup.

WARNING: When using the controller to control the element this is activated by the top sensor being under the set point. Most solar cylinders have the sensor too high, this should be at the halfway point. If using the top sensor pocket to control the element you will not guarantee the client more than 30L of hot water. **Ensure good contact between probe and what you are measuring.**



Common problems

- (1) No hot water:
 - a. Check element is switched on at the wall.
 - b. Check that the fuse in the thermostat has not popped.
 - c. Check the timing for the element is on for long enough.
- (2) System not performing as well as expected
 - a. Check non-return valve is installed and working, check not thermos phoning at night. (Temp at night should be similar to ambient) – may require a second NRV.
- (3) Boiling on the roof but not heating cylinder.
 - a. Check Non-return valve and pump are round the right way.
 - b. Bleed pump if making loud noise, is pump connected vertically?
 - c. Check pipe length is not more than 15m each way with small bore pipe (too greater frictional losses for the pump to handle) – quick fix is a second pump in series.
 - d. Check there is no high spots above the solar (will create a steam block) – use steam vent. (AAV).
 - e. Ensure NRV is after the pump.
 - f. Check steam vent (AAV) is working.
- (4) System flooding through house (not that common)
 - a. This has mostly happened where heat has got through to Polypropylene pipe and melted it. Ensure that copper is used where this can occur. (NB heat can travel up the cold supply pipe when the whole cylinder is HOT). May require thermal trap on the cold supply (bare copper pipe in a loop)
 - b. Check that the heat dump at the TPR valve can drain away without backing up and flooding.
- (5) Cylinder making banging noise
 - a. Due to cylinder expansion through heat. Ensure that a cold water expansion valve and a hot water TPR valve are fitted.
- (6) Sensor Error. (Check that the plastic surrounding the roof sensor has not melted to cause a short). NB Only the metal sensor should be inserted into the probe pocket. Check that the screw into the wire at the control box is screwed into the wire and not the plastic.
- (7) Funny temperature readings – Check the right sensor is used in the right position. PT1000 for roof and NTC for the cylinder
- (8) Element not coming up to 60C, check probe contact with cylinder and allow 4° for losses, Check timing and temp of heating program. Check clock time, check night rate and ripple control potential conflicts with timers.
- (9) Night circulation from cylinder to panel. Due to controller not reaching pump switch off temperature (DTF)
 - a. Improve connection with T2 Probe
 - b. Increase DTO and DTF by 5 degrees each

Limitations and clauses required for AS2712:2007

2.9.1

- (a) The solar water heater, parts and fittings are usable up to 10bar pressure / 1000kPA,
The system is made of copper so pool levels of copper are not acceptable for use.
For levels of high lime content please check the element in cylinder is incolloy otherwise Sunshine solar panels are capable of handling poor water quality.
- (i) The water heater will be installed in accordance with AS/NZS3500.4 including insulation and piping.
Copper piping to be used only throughout installed as per attached instructions
- (ii) Cylinders to be installed to allow for draining of system, water expansion and relief of vacuum as per AS/NZS3500.4
- (iii) Drain trays to be installed as per AS/NZS3500.4
- (iv) N/a
- (v) In case of hard water buildup of lime may occur on hot areas, ensure element type is suitable for the water type otherwise softening of water may be required.
- (c) The system is designed for level 1 and 2 frost protection, if in areas of long term below zero temperatures a closed loop system is advised.
- (d) Guards to the collectors may be required in areas of vandalism.
- (e) In areas of cyclonic conditions specific engineering design is required; refer to Installation Handbook revB for limitations. Panels weigh 18.8kg/m² when full of water.
- (f) For full installation including roof structure spacing please refer to Engineering Installation manual purling tables etc. Solar to be installed as to not compromise the structural integrity of the building.
- (g) Please use appropriate fixings per roof type as contained in this manual, for roof types outside of these then refer to engineering manual otherwise specific engineer design required.
- (h) Controller manual to be supplied to customer which has a boost instruction highlighted.
Controller manual to be supplied with the default printed settings of the thermostats.
- (j) Follow the finishing off instructions contained for commissioning of the system.
- (k) Ensure that all systems have an appropriately solar capable tempering valve and this is set to 55C or 45C for elderly, schools and preschools applications. We recommend a 20mm+ tempering valve for all low pressure applications.

Producer Statement

PRODUCER STATEMENT – PS1 – DESIGN



ISSUED BY: DAVIS OGILVIE & PARTNERS LTD
DESIGN ENGINEER: Daniel Langford
TO BE SUPPLIED TO: Various Territorial Authorities
IN RESPECT OF: Sunshinesolar Solar Collector Frames, and Structural Capacity of New and Existing Roof Structure; Fixing to Existing/New Roof and Structural Roof Elements in Accordance with "Sunshinesolar Solar Collector Installation Handbook Revision B".

AT: Various Locations with wind speeds less than or equal to "Very High", and Snow Loads less than or equal to 0.5 kPa, both found in accordance with NZS 3604:1999, or Snow Loads Determined in Accordance with Appendix G of "Sunshinesolar Solar Collector Installation Handbook Revision B".

We have been engaged by Shineshinesolar Ltd to provide Structural Engineering Design services in respect of the requirements of Clause(s) B1 of the Building Code for All or Part only (as specified in the attachment to this statement), of the installation of Sunshinesolar Collectors.

The design carried out by us has been prepared in accordance with:
 Compliance Documents issued by Department of Building and Housing B1/VM1 (AS/NZS 1170, NZS 4230, NZS 3603) or Alternative solution as per the attached schedule.

The proposed building work covered by the producer statement is described on Davis Ogilvie and Partners Ltd's prepared document titled "Sunshinesolar Solar Collector Installation Handbook - Revision B" dated 22 July 2009 together with the specification, and other documents set out in the schedule attached to this statement.

- On behalf of the Davis Ogilvie and Partners Ltd, and subject to:
- (i) Site verification of the following design assumptions: Wind speed, snow load, and building to meet requirements as specified in the "Sunshinesolar Solar Collector Installation Handbook, Revision B, Dated 22 July 2009"
 - (ii) Unless specifically noted, compliance of the drawings to Non Specific codes such as NZS 3604 and NZS 4229 have not been checked by this practice
 - (iii) This certificate does not cover weather-tightness of the building nor any flashings associated with the installation of the solar collector
 - (iv) Inspections to be carried out by Council
 - (v) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code.

Davis Ogilvie and Partners Ltd holds a current policy of Professional Indemnity Insurance no less than \$200,000*, and is a member of ACENZ Yes No

I, Andrew James Chapman am CPEng 1006515. I am a Member of IPENZ and hold the following qualifications: BE Civil (Hons), MIPENZ(Structural), CPEng, IntPE(NZ).


SIGNED ON BEHALF OF DAVIS OGILVIE AND PARTNERS LTD
PO BOX 13 0019, CHRISTCHURCH

Date: 22 JULY 2009

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000*.

This form is to accompany Form 2 of the Building (Forms) Regulations 2004 for the application of a Building Consent.

DIRECTORS ● Barry Greig ● Roy Hamilton ● Peter McAuley ● Richard Osborne ● David Ward ● Russell Stenge
PRINCIPALS ● Guy Canary ● Dan Cassel ● Claudine Osborne ● Terry Lindboom ● Jane West ● Lloyd McGlavery ● Craig Reeves
SENIOR ASSOCIATE ● Tony Aoley
ASSOCIATES ● Grant Cox ● Mairgin O'Call

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13/09/09/26/9/20662/install handbook/296722 at final.pdf rev b.doc
ACENZ

Report 09/2093

October 5th, 2009

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Customer: Advanced Solar Technologies Ltd
6 Fenhall Street
Russley
CHRISTCHURCH 8024

P1181/12

Attention:
John Wilson

Compliance of the Sunshine Solar Standard Performance Solar Hot Water Systems to the Requirements AS/NZS2712:2007

Appliance: Sunshine Solar Standard Performance SHW System

Alternative Names: Advanced Solar Technologies Standard Performance SHW System.
South-Solar Standard Performance SHW System.

Standard Applied: AS/NZS2712:2007

Full Report Ref.: 09/2024

Based on the information and results obtained during testing and assessment, the Sunshine Solar Standard Performance SHW systems named below comply with the requirements of AS/NZS2712:2007.

- Sunshine 30STD/300R

This compliance certificate relates only to the product sample tested. Any modifications to the product may invalidate the compliance results.

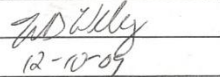
Our report 09/2024 gives details of the appliance, the assessment and the results obtained.

This report:

Prepared by: P. Wilkie



Approved by: W. S. Webley



Release Date:

12-10-09

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Periodic Maintenance

To ensure correct system operation and to retain the system and component Warranty, the system must be maintained in accordance with the recommended levels of maintenance. Please also refer to the operation and maintenance manual and check lists for further information. However, generally the periodic maintenance should consist of the following:

Every 6 Months

- Clean solar panel glazing
- Check drains free of obstructions

Annually

- Check solar panels for shading
- Check thermal and pressure relief valves and pressure relief valves for correct operation
- Check tempering valve for correct water temperature
- Check for worn seals around the solar panel
- Check cables to thermocouple sensors
- Check temperature sensor displayed temperatures
- Check electrical system and water booster heater
- Check pump and differential controller operation

3 years

- Check system and connections for leaks
- Replace pressure and thermal relief valves
- Replace cylinder sacrificial anodes
- Clean out strainers

