



SUNSAVER

Solar Energy Technologies

Installation, Operation &  
Maintenance Manual

Retro  
150 Litre/200 Litre  
Flat Plate  
Pumped Solar System



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## Liability waiver

This manual must be read in conjunction with the geyser, controller and pump manuals, as well as any additional depictions or instructions pertaining to any valves and installation thereof.

SunScan reserves the right to update this manual without prior notice. It is the installer's responsibility to ensure that the latest version of this manual is being used. The installation and maintenance of all SunScan thermal solar systems are to be carried out by trained and qualified personnel only.

SunScan may not be held liable for any damages to property nor injury or death that may result from the use of their product.

## 1. Introduction

Congratulations on purchasing a SunScan solar water heating system, all of our collectors use cutting edge technology and attractive design to bring you a high quality product.

This manual must be read thoroughly and understood before undertaking to install any of the SunScan range of products, please note that this manual is specific to the system or systems that appear on the cover page and "header", If after reading this manual any aspect of the installation process remains unclear contact a SunScan representative prior to installation.

This manual serves only as a guide to the correct installation of SunScan components; it does not seek to defy logic and or the experience of suitably trained installers, use discretion.

SunScan Solar water heating components must be installed in compliance with the following regulations:

**SANS 198**

**SANS 10252 -1**

**SANS 10254**

**SANS 10106**

**SANS 60335-2-21**

**SANS 10400 – parts A, B, L, XA**

**SANS 10142-1**

No modifications from these standards are allowed.

All local bylaws and estate laws must also be adhered to.

Failure to comply with any or all of these standards may result in injury or death and may void the warranty.

Any attachment, connection, integration or general association of parts or components that directly or indirectly affect the operation or performance of a SunScan product could void the warranty. Such parts not supplied by SunScan must be authorised by SunScan in writing in order to retain the benefits of the warranty.

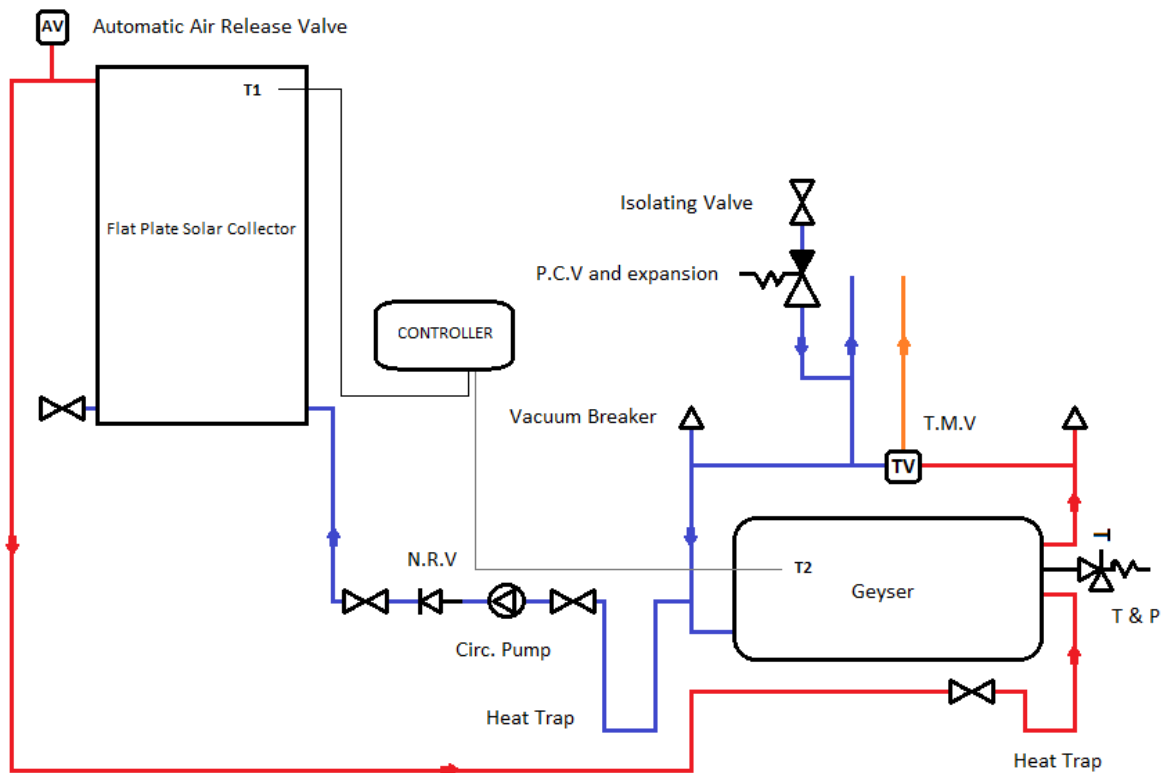
SunScan does not accept responsibility for the final fitness of the water for consumption, as the water quality is not affected by the system.

## 2. System description

### 2.1 How the system works

SunScan's SunSaver Retro-fit range are active direct systems that rely on a circulation pump to move water heated by the sun via a SunScan flat plate collector (panel) to a storage tank (geyser), this process is governed by a temperature differential controller. The controller measures the temperature difference between the panel (T1) and the geyser (T2). The pump circulates water from the geyser through the panel as long as the controller determines that there is an energy gain for the geyser.

The controller monitors the temperature of the geyser (T2) and activates the electrical element if the temperature falls below a pre-set temperature during a specific pre-set time.



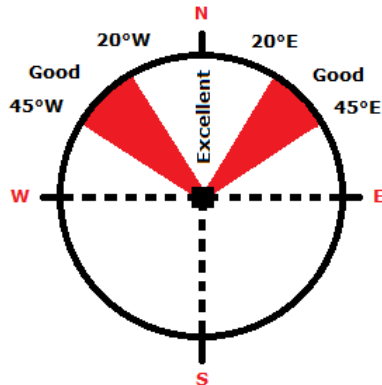
### 2.2 Thermal performance

MODEL	Q-FACTOR	ENERGY RATING
150L SunSaver Retro-fit	19.2mj	
200L SunSaver Retro-fit	21.5mj	

The technical data above has been verified and confirmed by tests conducted by the South African Bureau of Standards in terms of SANS 6211, at an incoming radiation of 20MJ per m<sup>2</sup> per day, a temperature differential of 10°C at an inclination of latitude plus 10°

### 2.3 Orientation and placement

North-facing (true North) is optimal when installing in the southern hemisphere, however deviations of up to 45° either side of North would be acceptable with very little effect on system performance, SunScan does not recommend the installation exceed the 45° range either side of North, however some exceptions may be made when 45° off North cannot be achieved. Contact a SunScan Representative for a rational design.



The collector should be mounted in an all year round shade-free area, or an area that does not shade between the hours of 9:00am – 15:00pm.

SunScan recommends the collector be mounted at an inclination or tilt angle between 20° and 50°.

Take care to ensure the roof area chosen for installation is structurally sound and capable of bearing additional weight. Consult a trained professional if required, if the roof or structure is found unfit to carry additional load, do not install the system unless the roof can be sufficiently strengthened.

### 2.4 Freeze protection

The SunScan SunSaver retro-fit range are direct systems equipped with intelligent temperature differential controllers, at pre set freeze protection temperatures the circulation pump is activated and warm water is circulated through the collector for short periods of time to ensure that freezing does not occur.

For safety reasons and to ensure the longevity of your system in areas where frost and or electricity outages are common occurrence a UPS backup must be installed.

### 2.5 Hail resistance

SunScan flat plate collectors are hail resistant with 3mm tempered glass, they can withstand hailstones of up to 35mm in diameter.

### 2.6 Scale resistance

In areas with poor water quality care should be taken to ensure that scale and mineral deposits do not affect the performance and longevity of your SunScan direct system, if you are unsure as to the water quality in your area consult your local municipality and or a SunScan representative.

Generally, water quality is acceptable when it contains less than 600 parts per million total dissolved solids.

A mildly acidic solution, e.g. vinegar can be used to flush the system and loosen scale deposits before refilling with fresh water and re-commissioning. **Consult a trained professional or installer in this regard.**

### 3 Safety precautions

#### 3.1 General safety information

- **WARNING!** This appliance is capable of producing temperatures that exceed 50°C.  
In certain circumstances safety valves could open to expel hot water and relieve pressure, Never obstruct these valves and always leave them open to the atmosphere.
- This apparatus is intended for water heating only.
- Any and all work carried out in regards to the installation, commissioning and maintenance of any SunScan Solar water heating system in its entirety is to be carried out by qualified and suitably trained professionals.

#### 3.2 Safety considerations for installation and operation

All installations are to be carried out in accordance with the Occupational Health and Safety Act (Act 85 of 1993) requirements and any relevant local authority prescriptions.

General points to consider:

- Assess site specific risks and mitigate to an acceptable level prior to installation, if required consult a trained professional.
- Water temperature can reach boiling point and collectors can stagnate at temperatures that exceed 150°C. Cover collectors during installation to prevent heating, and limit the risk of scalding.
- Be aware of any overhead power lines outside and electrical wiring inside the ceiling space.
- Handle collectors with care to prevent glass breakage, damage to property and personal injury.
- All safety gear must be worn at all times where relevant; these include but are not limited to safety goggles, gloves, hard hats and safety shoes.
- Ensure installation personnel are competent and in suitable physical condition.
- Any scaffolding or specialized safety equipment must be installed by certified personnel.
- Installers must be trained and conversant with the assessment of height hazards, safety procedures at heights and relevant safety equipment.
- All personnel working on the installation of a solar water heater must be issued with the appropriate safety equipment.
- Ensure that occupants are aware of all health and safety implications relevant to them.
- Do not attempt to install a solar water heating system if weather conditions are not suitable i.e. high winds, Rain and lightning, etc.
- In the event of prolonged periods of non-usage .e.g. occupants on vacation, ensure that the controller is set to 'Holiday Mode' to regulate the high temperatures that may be achieved (See controller manual).

## 4 Installation

### 4.1. System components

Main Components:

- 1 x Storage tank
- 1 x Flat plate collector
- 1 x Temperature differential controller
- 1 x Circulation pump

#### • Storage tank



Sometimes pre-installed (Solar component added afterwards)

#### • Flat plate collector



The SunScan 2m<sup>2</sup> / 2.4m<sup>2</sup> Flat plate collectors are manufactured from high quality materials which consist of:

- 3mm low iron ,refractive and tempered safety glass
- 0.5mm Aluminium complex anodised selective coated absorber
- Copper headers and riser tubes
- 35mm glass wool insulation
- Profiled aluminium 'smart design' casing

## • Temperature differential controller



The SR System controller is a temperature differential controller for split pressurized hot water systems, Main functions include:

- Clock display.
- Temperature difference on/off.
- Maximum tank temperature protection.
- Frost protection.
- Programming for a temperature controlled hot water circulation pump.
- Programming for a time controlled hot water circulation pump.
- Temperature controlled auxiliary heating during three time sessions.
- Protection functions (a. Memory protection, b. anti-bacteria protection, c. overheat protection).

## • Circulation pump



The GPD20-6SB 220v single phase brass bodied circulation pump is a 3 speed adjustable circulation pump and capable of circulating 18lpm-50lpm.

Additional Components may include:

- SR802 240v contact relay
- Thermostatic mixing valve
- Non-return valve
- Ball stop shut off valves
- Flat roof stand (On request)



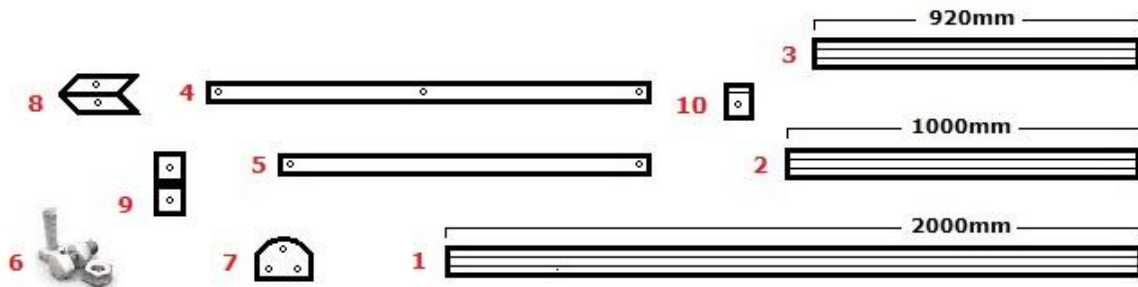
Components not supplied may include any and all relevant plumbing and electrical components required but not listed above, i.e. capillary fittings, Copper tubing, electrical cable etc.

#### 4.2 Important considerations and good practice

- All plumbing must conform to the relevant governing bodies, as this is a retro-fit system and the storage tank may have been installed prior to the addition of the solar component; ensure that the storage tank complies with SANS 10254.
- Ensure a minimum distance of 3m of copper tubing separates the collector from the tank.
- An isolating valve must be installed on the supply and return pipe to and from the collector as well as the bottom of the collector (side not being supplied by water) this is for maintenance and safety purposes, Always ensure that the collector is covered when carrying out any maintenance that may require these valves to be shut, ensure that after the maintenance is carried out that these valves are reopened to prevent any pressure build up that may cause damage to the collector and or pipe work.
- Only compression fittings shall be used on the collector and within 1m of these connections, for the rest of the circulation loop high temperature solder may be used.
- All Brass fittings and or valves, safety or otherwise will be DZR rated, and approved for use by SABS.
- All pipe work to and from the collector must be copper (Class 1 minimum).
- The pump shaft may only be installed as per the manufacturer's instruction (See pump Installation manual).
- All pipe work to and from the collector, and any pipe/s transporting hot water are to be insulated, insulation will be heat tolerant and made UV resistant.
- SABS approved plastic piping may only be used inside the building, downstream from the thermostatic mixing valve.
- The thermostatic mixing valve provided must be installed to ensure safe use of the system, and should be accessible for maintenance purposes.
- During installation ensure no debris e.g. Metal filings, packaging residue, saw dust etc. enters the system, if this does occur flush the system prior to filling.
- Cover collector while installing the pipe work to prevent stagnation and possible scalding.
- Exercise caution while lifting and installing the collector onto the roof, ensure that there are enough personnel present to bear the weight and that there are adequate lifting tethers and safety rigging as required.

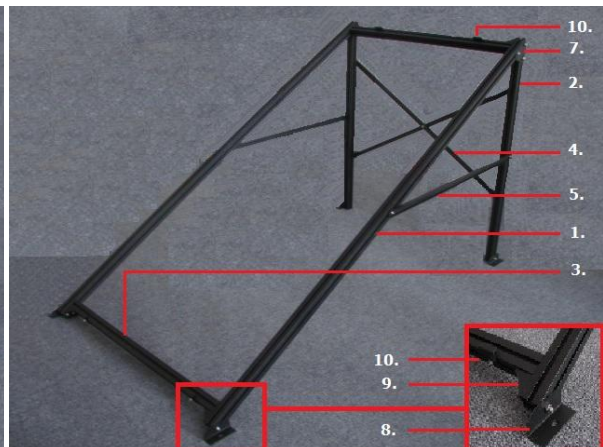
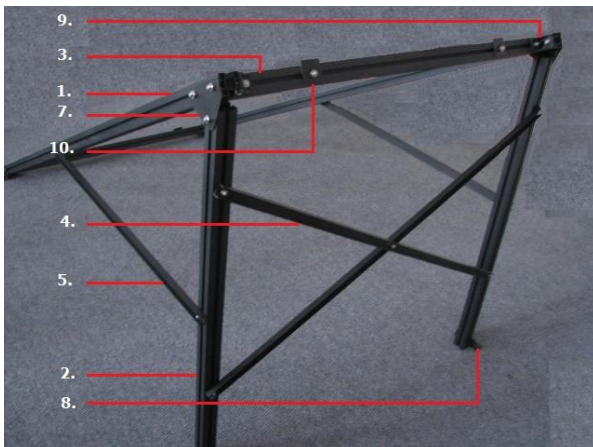
### 4.3 Flat roof stand assembly and installation

#### Components:



A combination of powder coated aluminium and Marine grade stainless steel make up SunScan's adjustable Flat roof stand.

1. – 2 x Side supports (Aluminium)
2. – 2 x Vertical supports (Aluminium)
3. – 2 x Cross supports (Aluminium)
4. – 2 x Back cross braces (Aluminium)
5. – 2 x Side braces (Aluminium)
6. – 8mm Stainless Steel Nuts and Bolts (316 SAE Marine grade)
7. – 2 x Side angle plates (316 SAE Marine grade)
8. – 4 x Foot plates (316 SAE Marine grade)
9. – 4 x Corner brackets (Aluminium)
10. – 4 x Securing clips (316 SAE Marine grade)



The standard vertical support is 1000mm, however upon request if required longer or shorter vertical supports may be provided in order to obtain the optimum inclination or tilt angle.

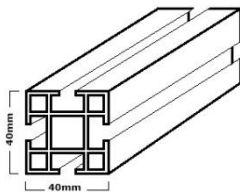
### Inclination and tilt angle

The optimum angle is equal to the latitude of the location plus 10°. i.e. a location with latitude of 25° would indicate an optimum inclination of 35°, 15° either side of these figures will make very little difference in terms of performance.

Please note that a min 20° and max 50° tilt angle must be respected at all times.

### Assembly

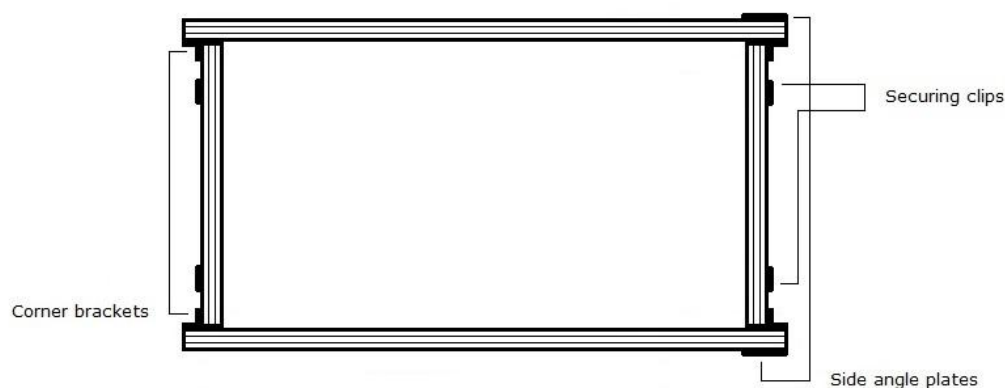
• **Note:**



SunScan's unique powder coated aluminium profiled channel allows for easy assembly, slide the 13mm head of the 8mm bolts provided into the channel to assemble components.

### Step 1

Lay the two side supports (1) on a flat area roughly 1m apart, insert the two cross supports (3) at either end and between the side supports, place 2 bolts in the channel of each cross support that faces outward and attach two securing clips (10), using corner brackets (9) and nuts and bolts (6) secure the cross supports to the side supports.



**Step 2**

Using nuts and bolts attach each side angle plate (7) to either side of the side supports; attach each vertical support (2) to the side angle plate on either side.

**Step 3**

Using nuts and bolts attach each side brace to the vertical and side supports.

**Step 4**

Using a bolt through the centre holes attach the two back cross braces (4) together, attach the back cross bracing to the vertical supports. Attach a foot plate (8) to the end of each vertical support; attach a foot plate to the bottom end of each side support.

**Step 5**

Flip the structure 180° so that the foot plates are on the flat area.

**Step 6**

Adjust the inclination by loosening the side angle plates on the side supports and carefully sliding the vertical supports up or down the side supports, once a suitable tilt angle has been acquired make sure that all the nuts and bolts have been securely tightened.

**Installation**

Always ensure that materials used to fasten the collector and or frame to the roof do not accelerate corrosion, and that no galvanic action occurs, if required U.V. resistant insulators must be used.

**Step 1**

Lift the assembled frame onto the roof carefully using tethers and rigging as required.

**Step 2**

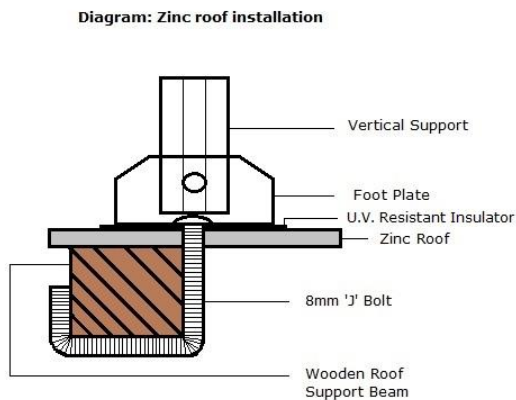
In the case of a zinc roof SunScan recommends that a minimum of 4 x 8mm 'J' Bolts are used to secure the flat roof stand, place the stand in the intended position, making sure to line up with the existing timber structure inside the ceiling space, if this is not possible additional timber support beams may be required, also ensure that these structures have been assessed and can bear the additional load weights.

**Step 3**

Using the foot plates and a pencil, mark out where the four 8mm holes (for 'J' Bolts) are to be drilled, remove the stand and drill the holes.

## Step 4

Place the stand and foot plates over the holes and insert the U.V. resistant insulator, from inside the roof space thread the 'J' Bolts through the holes, ensure that there are at least two personnel to achieve this goal, secure a nut to the end of the 'J' Bolt and tighten, repeat this process for all four foot plates.



## Step 5

### Waterproofing

Ensure that any holes or modifications to any roofing are adequately waterproofed.

SunScan recommends a UV resistant sealant.

### 4.4 Storage tank

Usually pre-installed, if so ensure that the installation is SANS 10254 compliant, if this is not the case inform the relevant parties and discuss ways to resolve any non compliance issues, do not install the solar component if compliance cannot be achieved. (See Manufacturers installation manual)

- **Note:** Before installing or maintaining any plumbing or electrical component ensure that any water and or electricity supplied to the component is shut off upstream from where the intended work is to be carried out.

### 4.5 Mounting the collector

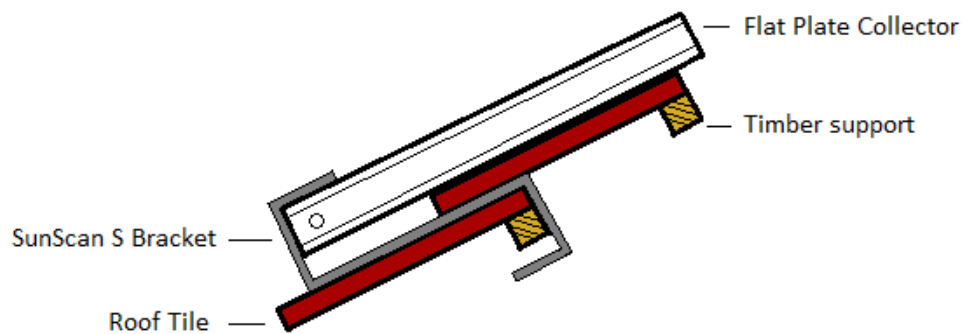
Ensure that the thermal probe pocket located on the top left corner of the collector is always installed at the highest point, and that the collector is installed the right side up.

### Mounting to a SunScan flat roof stand:

Mount the collector to the flat roof stand using the 4 securing clips provided, allow the two securing clips located on the bottom cross support to slot into the aluminium profile of the flat plate collector, attach two securing clips to the top cross support and repeat process, tighten the nuts to ensure the collector is fastened to the stand.

## Typical flush mounting:

Loosen the roof tile and slide up, place one hooked end of the 'S' Bracket over the timber support and tile beneath, ensure that the waterways are kept free from obstruction, repeat this process on the same tile line between 800mm and 1000mm apart, slide the tiles that were moved back into place, place the flat plate collector into the hooked end of the 'S' Brackets. (at least two 'S' Brackets should be used)



## Waterproofing

Ensure that any holes or modifications to any roofing are adequately waterproofed.

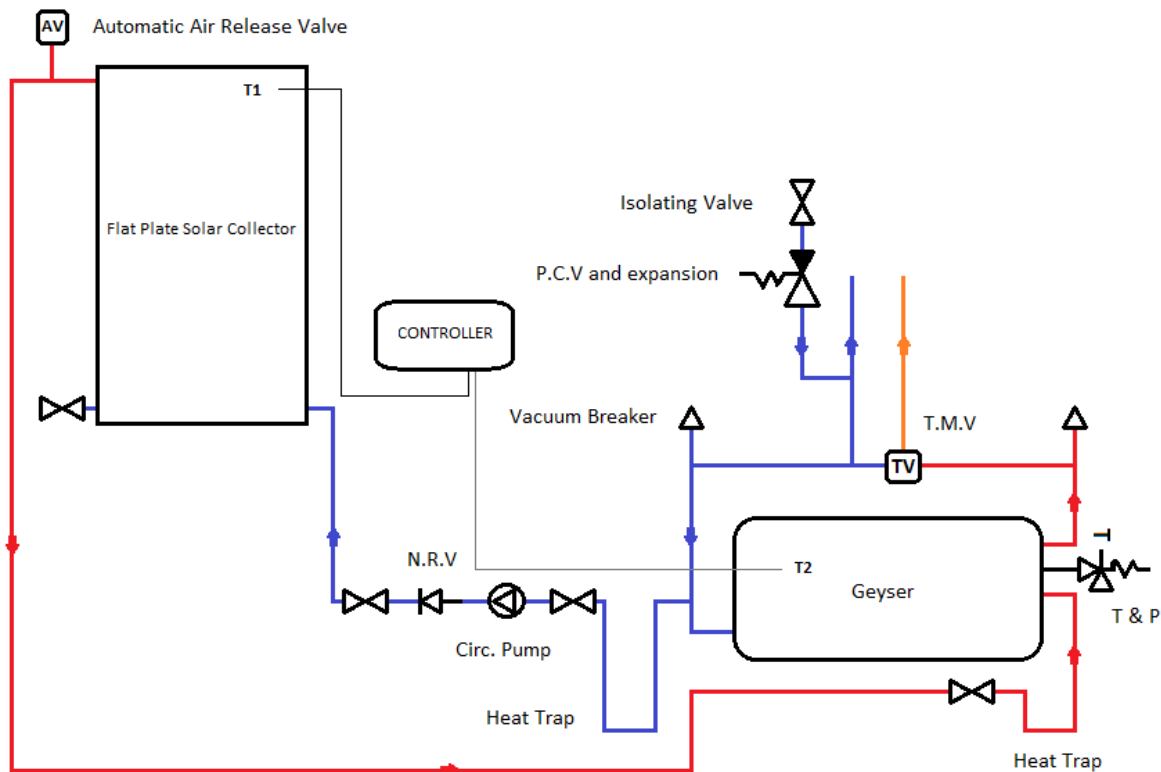
SunScan recommends a UV resistant sealant.

## 4.6 Plumbing Installation

**Note:** When tightening compression fittings, use one spanner to hold the weld nut and another to tighten the compression nut. Do not grip any pipe work and take care not to over tighten.

### **Note:**

Unless otherwise specified all solar loops (pipe runs between collector and tank) in a SunScan Pumped Solar thermal system are to be installed using 15mm copper tubing with a rating not less than class 1



**Diagram A**

### Installation of the cold supply to the collector

In a SunScan SunSaver Retro-fit system the cold supply to the collector is 'tee'd' off of the cold supply to the storage tank within 500mm from the drain cock, this must be done downstream from the Pressure reducing valve to ensure a balanced pressure is maintained and that the storage tank does not exceed its pressure rating.

### Installation of the hot return from collector

"Solar Ready Geysers" provide an additional port for alternative heating; connect the pipe returning from the collector to this port.

If the Geyser is not "Solar Ready"

Remove the existing Temperature and pressure relief valve from the geyser, use this port for the solar hot return, and install an approved "Banjo" type temperature and pressure relief valve on the hot supply to the house.

**Important!!!**

**DO NOT CONNECT THE SOLAR HOT RETURN TO THE BANJO VALVE!!!**

### Installation of the pump

The pump must be installed according to the manufacturer's instruction manual. To assist with priming, the level of the pump must always be below the water level of the geyser, failure to comply may result in pump failure and any warranty may be forfeit.

**Note:**

- The pump must be mounted with the shaft in the horizontal position. (See pump instruction manual for variations)
- The pump must be mounted on the cold side of the solar circulation loop.
- Take note of the arrow on the pump and ensure that the water will circulate in the correct direction through the solar loop.
- An isolating Valve shall be installed on either side of the pump.
- The pump is not designed to withstand weather elements, in the event of the pump being installed outside; it shall be placed in a suitable weather resistant box.

**Installation of the non-return valve**

- The non-return valve must be of the spring type
- The nrv must be installed in after the pump between the isolating valve and collector. (See diagram A)

**Installation of Heat traps**

Heat traps reduce the occurrence of thermosiphon between the collector and storage tank and are an important part of a pumped Solar System, they should be no less than 400mm vertically and 300mm at the horizontal part of their loop, they shall also exceed the bottom of the storage tank by at least 200mm.

**Installation of Anti-Scalding/Thermostatic Mixing Valve**

Ensure that both hot and cold water supplied to the valve are of equal pressure, and that any markings directing or depicting the flow of water are adhered to.

For safety reasons, it is essential to install a thermostatic mixing valve. This valve controls the temperature of the water at the point of use. Make sure that the valve has been set to allow a suitable maximum temperature and has not been set to by-pass. The temperature ranges from 38°C – 65°C.

We recommend a setting that will achieve 55°C at the point of use, but may not exceed 60°C.

**Installation of pipe work to and from the collector**

Always ensure that the hot return from the collector is connected to the highest connection point on the collector. Ensure that the cold supply to the collector is connected to the lowest connection point on the collector, opposite to the hot return from collector connection. (See diagram A)

The pipe runs to and from the collector 'hot and cold return and supply' must measure a minimum distance of three meters each and should not exceed ten meters each, if this cannot be achieved contact a SunScan representative for rational design.



## 4.7 Controller and UPS installation

### Note:

- Disconnect all power sources before working on any electrical equipment.
- It is recommended that the controller be powered from a separate power source to that of the heating element power supply. A standard household outlet will suffice. Typical power draw from the controller and pump together is less than 50W.
- If the controller is to be powered from a heating element power source, it is essential to confirm that no ripple relay or timer is attached to that source
- The controller has two different temperature sensors. Only the PT 1000 (Black Sensor) can be used in the Collector (T1).
- Be advised that no modifications from SANS 60355-2-21 are allowed. The geyser complies with these requirements and the SunScan system only adds to the safety by installing a relay in the power supply to the geyser. **All the existing thermal cut-out protections of the geyser need to be maintained.**
- The geyser thermostat is set at 70°C and will function as a safety back-up should the controller or the relay malfunction and the power to the element is not switched off.
- It is recommended that the controller be positioned close to the geyser to minimise wire runs and that the display is mounted in an easily accessible area.
- The following components may be installed by a qualified solar installer:

Collector sensor (T1)  
Tank sensor (T2)  
Pump supply  
Power supply to controller

### Controller installation

Ensure that you use the high-temperature sensor (PT1000-black sensor) on the Collector (T1). This sensor can withstand up to 280 °C. Slide the sensor all the way into the thermal pocket on the collector. The sensor wire is now fed through a separate hole in the roof to the controller.

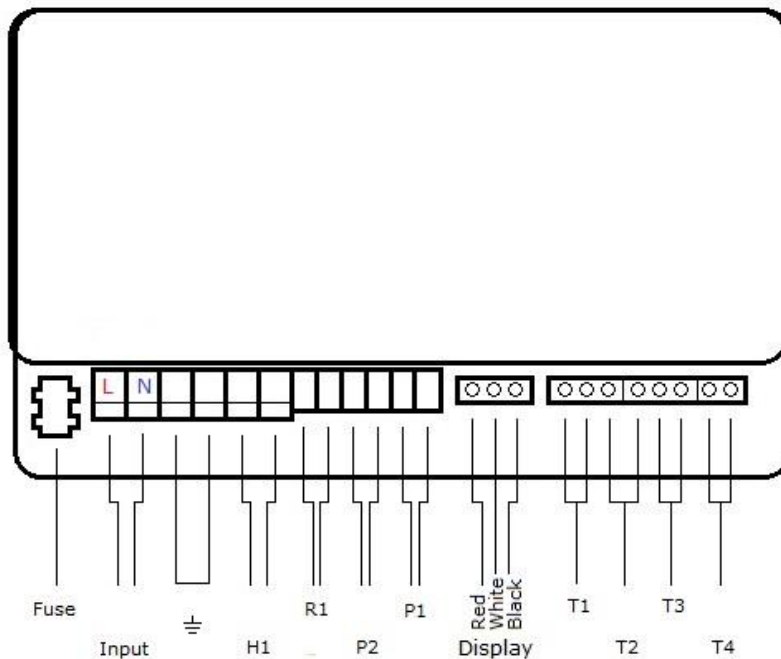
The sensor to the storage tank (NTC10K-grey) is fed into a thermal pocket on the storage tank, make sure that the sensor is inserted all the way, if the storage tank does not have an additional thermal pocket a “ ntc10K micro sensor” may be used, remove the thermostat from the thermal pocket then re-insert the thermostat along with the micro sensor, take care not to damage the micro sensor upon insertion.

**Note:** No modifications to the original geyser thermostat are allowed. This is to maintain all fuse and or thermal cut-out protections.

The pump must be connected using suitable cable (220V and 0.5A.)  
(See Pump Instruction Manual)

### Connecting to the controller

**WARNING!!** : SR Solar water heating controllers may vary. Always refer to the installation manual supplied with the controller the diagram below depicts a typical installation.



**Diagram B**

• Always ensure that you follow the wire diagram provided by the manufacturer as there might be slight variations to the example provided above.

**Step 1**

Connect supply (input) as indicated in diagram B. Live, Neutral, Earth.

**Step 2**

Connect SR802 contactor relay (H1) as indicated in diagram B.

**Step 3**

Connect GPD20-6SB solar circulation pump (P1) as indicated in diagram B.

**Step 4**

Connect display wire (in order from left to right) red wire, white wire, black wire.

**Step 5**

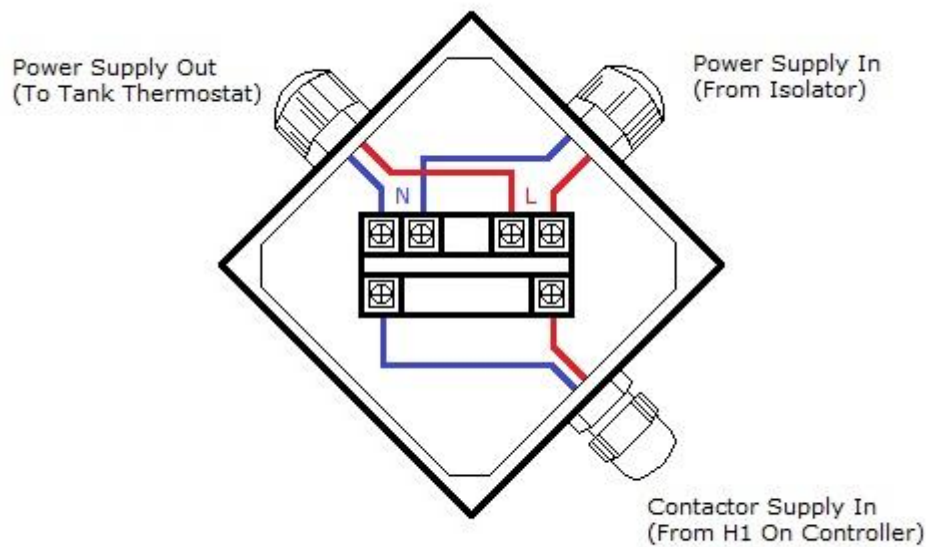
Connect Black sensor wire (T1) as indicated in diagram B.

**Step 6**

Connect grey sensor wire (T2) as indicated in diagram B.

The following installation of components and electrical work must be carried out by a qualified electrician.

**Connecting the relay and power supply to the geyser.**



**Note:** It is recommended that if required a relay supplied by SunScan is used for all electrical heating elements regardless of their kilowatt rating.

The earth wire must be connected with a block which bypasses the relay. The relay control wires are connected to the relay from (H1) as shown to 0 and 1 on the relay.

The live from the geyser isolator switch is connected to 2 on the relay and the live to the tank element/thermostat is connected to 4. The neutral for the geyser isolator switch is connected to 6 on the relay and the neutral to the tank element is connected to 8.

#### UPS installation

- In areas where frequent power outages are a problem, and or where frost occurs, an uninterrupted power supply and or photovoltaic option must be installed.
- The Ups system should consist of a 12v deep cycle battery and a 240v inverter. This must be connected to the controller and serve as a backup or alternative power supply, this will ensure that any interruption in the regular power supply will not affect the functionality of the controller and or freeze protection methods thereof.

#### 4.8 Commissioning

- Check that all nuts and bolts securing the collector to the stand are tight and that all anchoring points to the roof are secure.
- Make sure that all plumbing connections have been tightened, all pipe work has been secured, the isolating valves on the solar loop are open( two either side of the pump, one on the hot return), and the isolating valve on the collector is closed.
- Check that the drain cock is closed
- Ensure that all electrical connections are secure and covered.

#### Step 1

Ensure that there is water supplied to the property and that at least one hot water point of use that will be supplied by the SunScan system is open, this will allow any air trapped in the system to be expelled, at the hot water tank open the valve that isolates the water from the tank, allow the tank to fill, at the point of use opened prior to filling ensure that all of the air has been expelled, this may take several minutes, once a steady stream of water appears ensure that all points of use are closed so that the system may pressurise.

## Step 2

Check for any water leaks at all plumbing joints.

## Step 3

Shut off the mains water supply to the system and open any inline strainers and clean any debris that might have accumulated, this is particularly important if the dwelling is new as there is often debris in the mains water supply. Re-open the supply after.

## Step 4

Switch the SR868C8 controller and any electrical isolators/circuit breakers that control power supply to the element on.

## Step 5

Remove any covering from the collector and allow the system to heat, ensure that the temperature in the collector (T1) on the display rises and that the temperature in the tank (T2) is displayed accurately, at a factory preset of 8°C difference in temperature between T1 and T2 ensure that the pump switches on. Use a multi-meter to test that the heating element and SR802 relay (if in use) function correctly.

## Step 6

Re-check the system for leaks after it has heated.

### 4.9 Check list

The following check list must be observed before handing the system over.

- All air has been removed from the system (See step 1 of 4.8 commissioning)
- There are no water leaks on the system and or any pipes carrying water to points of use.
- Roof tiles have been placed back in position
- Roof flashing and any waterproofing is water tight.
- All drain pipes are free of obstruction
- All hot water pipe work and piping to and from the collector is insulated.
- The end user has been instructed on the use of the controller.

## 5 Operating instructions

### 5.1 Start up procedure

If for any reason the water supply to the property and or solar system is interrupted e.g. municipal works or maintenance, and the system requires re-commissioning, follow steps 1-6 of 4.8 Commissioning, always ensure that the relevant safety procedures are adhered to.

### 5.2 Emergency shutdown procedure

Should the need arise and the system is damaged or leaking hot or cold water, the water supply shut off valve must be closed immediately and power to the controller and heating element turned off.

### 5.3 System performance

The amount of hot water generated and available is dependent on usage patterns and the weather experienced. Solar radiation is greater on clear, sunny days, between 9am and 3pm, during periods of use the system can operate at roughly twice the maximum ambient temperature and during periods of non use is capable of achieving well over 70°C.

Ensure that any trees that may cause shading during the afore mentioned times are regularly pruned.

To get the most out of your solar water heating system we suggest the following:

- Take showers instead of baths as generally they use less hot water.
- Use the bulk of your hot water requirements in the evening instead of the morning, this will maximize the usage of free energy harvested during the day.

#### 5.4 High water temperatures

The SunScan SunSaver retro-fit system is capable of reaching temperatures that exceed 50°C. This may occur during prolonged periods of direct sunlight and particularly in summer, and or long periods of reduced water usage. Extreme care should always be taken.

Although every system is fitted with a thermostatic mixing valve that regulates temperature at the point of use, always check the water before use to ensure it is suitable for its intended purpose and to prevent scalding.

#### 5.5 Over-heat protection

The SunScan SunSaver Retro-fit system is equipped with an over-heat protection function, this is to ensure that excessive temperatures are not stored in the tank and that damage is not caused to other working parts.

Please note that these are factory presets and do not require any adjustment unless deemed so by a suitably competent person.

On the SR868C8 we recommend the following settings:

<b>EMOF</b>	<b>120 °C</b>
<b>EMON</b>	<b>110 °C</b>
<b>CMX</b>	<b>100 °C</b>
<b>CFR</b>	<b>5 °C</b>
<b>SMX</b>	<b>65 °C</b>
<b>REC</b>	<b>On</b>

These settings allow for a maximum temperature in the cylinder to be set. 65°C (SMX). If for some reason the power source to the controller is interrupted, the system will turn off completely. During this time, the collector temp will rise towards its stagnation temp (153°C). If the temperature of the collector is below 120°C (EMOF) when the power is reinstated, the controller will revert to the cycle that it had taken previously. However, if the temperature of the collector is above 120°C (EMOF), then the system will remain in an off position. At night when the collector temperature drops below 110°C (EMON) and geyser temp (T2) is below 68°C (SMX-2), the pump will start and the system will recover and be ready for the next day's heating.

#### 5.6 Holiday mode

SunScan strongly recommends that the holiday function be set:

- When occupants are absent for extended periods of time e.g. holiday.
- No hot water is required for extended periods of time.

This is to prevent extended periods of high temperatures that may affect the longevity and lifespan of your solar water heating system.

This function activates the circulation pump at night between the hours of 10:00pm and 6:00am when the collector (T1) temperature has dropped 8°C lower than that of the tank temperature (T2) once a 2°C temperature difference is reached, the circulation pump ceases, this continues for the duration of the afore mentioned times until the tank temperature reaches 35°C.

- Always remember to switch holiday mode off when hot water is required.

## 6. Maintenance

### 6.1 Routine maintenance

Note: These are suggested schedules and may need to be carried out more frequently depending on water quality .e.g. areas with high incidents of water deposits such as magnesium and or calcium.

If any maintenance carried out requires the collector to be isolated by means of the two isolating valves located on the hot and cold return and supply pipes to and from the collector, always ensure that the collector is covered during this time and that the valves are re-opened after the maintenance procedure has been carried out.

- Always ensure that the collector is clean and that no dirt has collected on the surface as this will affect performance, if required use a soft cloth and fresh water to carefully wipe the glass clean, ensure that this is carried out early in the morning before the collector has had a chance to heat.
- Regular checks should be done to see that no damage has occurred to the system and that the system and pipe work are free of any leaks.
- Circulation pumps should be checked and cleaned by qualified personnel regularly, to ensure that they are operating correctly see 'Hand' function in the controller manual to force pump activation.
- The system should be drained and flushed Bi-annually if required to remove any scale build up that might have occurred.
- A periodic inspection of all valves should be carried out, this includes but is not limited to temperature and pressure relief valves, pressure reducing valves, expansion valves, vacuum breakers and thermostatic mixing valves, these valves allow for the safe operation of the storage tank and should be inspected twice annually by a trained professional.
- Temperature and pressure relief valves as well as expansion valves may release small amounts of water each day whilst heating, this is a normal function, as heated water expands by approximately 1L out of 50L of its volume, if these valves leak continuously however, this may indicate failure and may need replacement. if unsure contact a authorised installer.  
It is important that the discharge from these valves are not sealed off, and are left open to the atmosphere, these valves must discharge safely without harm to persons or property.
- All filters and strainers are to be checked and cleaned regularly by suitably qualified personnel.
- Check mountings on collector for weathering and or fatigue.
- Pipe insulation should be checked for degradation and damage and replaced if necessary, always be aware of high temperatures emitted from the collector and pipe work when carrying out any maintenance that might put you at risk of scalding.(ensure the correct safety precautions are taken)
- If at any time the temperature at the point of use seems to be increasing or decreasing contact an authorised Installer as the thermostatic mixing valve may need adjustment or repair.
- Any repairs or replacements of any parts must be performed by an authorised installer.
- In case of emergency, for example, damage to the collector, tank or pipe work is evident, shut off the water supply to the system ,switch off the power to the controller and heating element immediately and contact an authorised installer.
- Any inspections, visual or otherwise carried out by any person or persons that are not suitably qualified and result in injury or death and or damage to property, shall not hold Solar Lifestyles cc t/a SunScan or any of their affiliates liable.

## 6.2 Trouble shooting

Before applying any of the trouble shooting techniques listed below:

- Ensure that the power to the controller and heating element has not been interrupted i.e. all relevant circuit Breakers and or isolator switches are in the on position.
- Ensure that the water supply to the storage tank has not been interrupted and inadvertently drained for example , municipality working on water mains.

<b>Problem</b>	<b>Possible cause</b>	<b>Corrective action</b>
Back up heating element switches on outside of pre-set heating times	Clock on the display panel was not set or has lost time	Reset the clock and ensure that pre-set electrical heating timers are set according to hot water requirements, If the clock continues to lose time contact your dealer
Tank not heating during pre-set times	Holiday mode may be on, T2 sensor probe may not be inserted correctly, heating element failure	Ensure holiday mode is turned off, carefully re-insert T2 sensor probe into thermal pocket(all the way in), Contact authorised installer if element failure is suspected
No solar heat contribution	Low solar radiation, T1 sensor probe or T2 sensor probe may not be inserted correctly, Circulation pump failure or one or more isolating valves have been shut	On days with low solar radiation ensure that the backup heating element times are adjusted according to hot water requirements, Carefully re-insert T1 and or T2 sensor probe/s into its/their relevant thermal pocket/s(all the way in), Contact authorised installer if circulation pump failure is suspected, ensure both isolating valves either side of the pump are open.

- Contact an authorised dealer if after checking the above there is still no hot water.

## 7 Technical specification

### 2 m<sup>2</sup> SunScan Flat plate collector specification

- Suitable for a 150L SunScan SunSaver Retro-fit system

#### SS-FP RANGE

<b>Collector Type</b>	<b>SS-FP-2.0</b>
-----------------------	------------------

<b>General Information</b>	
Standard Dimensions	2.005m x 1.003m
Gross Area	2.01
Aperture Area	1.86
Absorber Area	1.745 m <sup>2</sup>
Number of Covers	1
Cover Material	tempered glass
Cover Thickness	3mm
Cover Transmission	88%
Weight	32kg
Power output at 1000W/m <sup>2</sup> (t <sub>m</sub> -t <sub>a</sub> ) = 30 °C	1029 W

<b>Casing</b>	
Frame Material	Aluminium
Frame Colour	Bronze Brown
Back Plate Material	Aluminium
Sealing Gasket	Ethylene-Propylene Diene Monomer

<b>Absorber</b>	
Material	Aluminium
Thickness of Absorber Plate	0.5mm
Surface Treatment	Cu and Al complex
Volume of Absorber	1.66 L
Header Material	Copper
Header Tube Size	22mm
Riser Material	Copper
Riser Tube Size	12mm
Operational Pressure	600kPa
Test Pressure	1500 kPa
Stagnation temperature	153 °C

<b>Thermal Insulation</b>	
Insulation Material	Glass Wool
Back Insulation Thickness	35mm
Side Insulation Thickness	25mm



**2.4m<sup>2</sup> SunScan Flat plate collector specification**

- Suitable for a 200L SunScan SunSaver Retro-fit system

**SS-FP RANGE**

<b>Collector Type</b>	<b>SS-FP-2.4</b>
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<b>General Information</b>	
Standard Dimensions	2.005m x 1.200m
Gross Area	2.40
Aperture Area	2.24
Absorber Area	2.210m <sup>2</sup>
Number of Covers	1
Cover Material	tempered glass
Cover Thickness	3mm
Cover Transmission	88%
Weight	38kg
Power output at 1000W/m <sup>2</sup> (tm-ta) = 30 °C	1244 W

<b>Casing</b>	
Frame Material	Aluminium
Frame Colour	Bronze Brown
Back Plate Material	Aluminium
Sealing Gasket	Ethylene-Propylene Diene Monomer

<b>Absorber</b>	
Material	Aluminium
Thickness of Absorber Plate	0.5mm
Surface Treatment	Cu and Al complex
Volume of Absorber	1.99 L
Header Material	Copper
Header Tube Size	22mm
Riser Material	Copper
Riser Tube Size	12mm
Operational Pressure	600kPa
Test Pressure	1500 kPa
Stagnation temperature	153 °C

<b>Thermal Insulation</b>	
Insulation Material	Glass Wool
Back Insulation Thickness	35mm
Side Insulation Thickness	25mm

## WARRANTY CERTIFICATE

**Solar Lifestyle** warrants the functionality of the components of their SunScan product as follows:

<u>Product</u>	<u>Parts</u>	<u>Labour</u>
SunScan F/P Collectors	10 years	1 year
Digital Controller	2 years	1 year
Circulation pump	2 years	1 year
Thermostatic Mixing Valve	2 Years	1 Year

The system is covered for the indicated period from the date of installation and is provided under the following conditions:

- It was installed by a SunScan Certified Installer or Implementation Partner.
- It is only supplied by municipal water with a total dissolved hardness of less than 600 ppm at a working pressure that does not exceed the maximum operating pressure of the tank.
- The system is not left standing uncovered with no water supply for longer than 14 days.
- All requirements as detailed in the installation manual were complied with.
- This warranty only applies to the solar system product parts listed above and does not apply to any additional electrical and/or plumbing parts supplied by the installer or the installation.
- Should a part of the solar system product be replaced during this period, only the balance of the original warranty will continue to remain effective.
- Solar Lifestyle is excluded from responsibility from any consequential loss including: injury to persons, damage to property, economic loss, any legal or other damages due to manufacturing defect. Consequential loss shall be covered by the general household insurance policy of the home owner.
- Swimming pool, Spa and Jacuzzi water may not be circulated through the collector.
- If the collector is installed in a direct system in freezing areas, an adequate frost protection system (battery backup on controller) needs to be provided. The warranty does not include damage caused by freezing.
- Collectors connected in series must make use of flexible couplings.
- Accidental breakage is not covered by this warranty, and should be added to your general household insurance policy.
- Replacement or repair excludes all transport costs.
- Should a dispute arise from an installation, or from the product, the dispute will be referred to SESSA for arbitration and the parties will be held by the arbitrators' decisions.
- Tempering valves and Air release valves are serviced biannually with recorded proof.

**The individual component warranty document will be used in conjunction with this document.**

### Register Warranty

(Please fill in the details below and fax or email to info@sunscan.co.za)

**Name and Surname:** \_\_\_\_\_

**Installation Date:** \_\_\_\_\_

**Installation Address:** \_\_\_\_\_

**9 Sign off (customer copy)**

**Supplier details**

Solar Lifestyle cc t/a SunScan™  
 Physical address Unit S17 Spearhead  
 Business Park  
 Montague Drive  
 Montague Gardens  
 Cape Town  
 7441  
 Postal address Suite No. 73, Private Bag x 7  
 Chempet, 7442  
 Tel +27 86 100 5684  
 Fax +27 86 689 4401  
 Email [info@sunscan.co.za](mailto:info@sunscan.co.za)

**Installer details**

Company Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Tel: \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Installer Sign-off**

Installer Name: \_\_\_\_\_  
 Installation date: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Customer Name: \_\_\_\_\_  
 Customer address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Customer acceptance**

I, \_\_\_\_\_  
 \_\_\_\_\_, (I.D. No) \_\_\_\_\_  
 hereby declare that the solar system has been  
 installed to my satisfaction, it has been  
 demonstrated to me and is in working order and I  
 have been instructed in its operation, maintenance  
 and usage.  
 Product Serial No: \_\_\_\_\_

The installer hereby warrants that the system has  
 been installed in accordance with the instructions  
 contained in this manual.

\_\_\_\_\_  
**Installer signature**                      **Date**

\_\_\_\_\_  
**Customer signature**                      **Date**

**10 Sign off (installer copy)**

**Supplier details**

Solar Lifestyle cc t/a SunScan™  
 Physical address Unit S17 Spearhead  
 Business Park  
 Montague Drive  
 Montague Gardens  
 Cape Town  
 7441  
 Postal address Suite No. 73, Private Bag x 7  
 Chempet, 7442  
 Tel +27 86 100 5684  
 Fax +27 86 689 4401  
 Email [info@sunscan.co.za](mailto:info@sunscan.co.za)

**Installer details**

Company Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Tel: \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Installer Sign-off**

Installer Name: \_\_\_\_\_  
 Installation date: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Customer Name: \_\_\_\_\_  
 Customer address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Customer acceptance**

I, \_\_\_\_\_  
 , (I.D. No) \_\_\_\_\_  
 hereby declare that the solar system has been  
 installed to my satisfaction, it has been  
 demonstrated to me and is in working order and I  
 have been instructed in its operation, maintenance  
 and usage.  
 Product Serial No: \_\_\_\_\_

The installer hereby warrants that the system has  
 been installed in accordance with the instructions  
 contained in this manual.

\_\_\_\_\_  
**Installer signature**                      **Date**

\_\_\_\_\_  
**Customer signature**                      **Date**