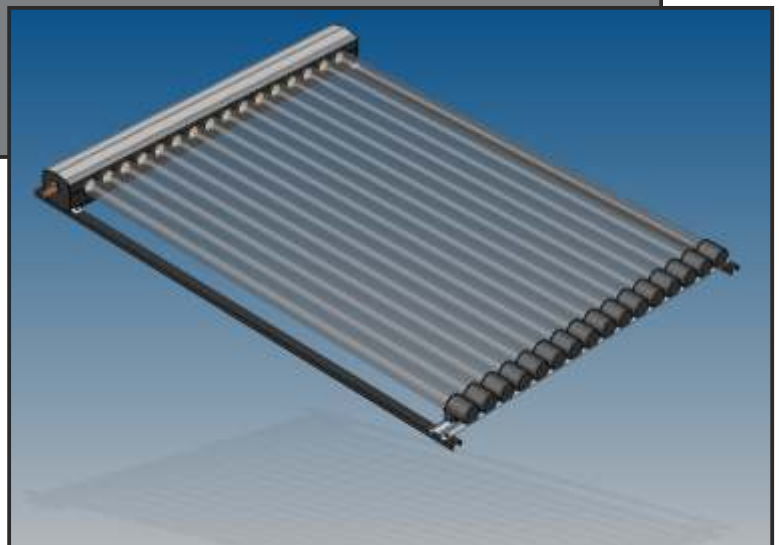
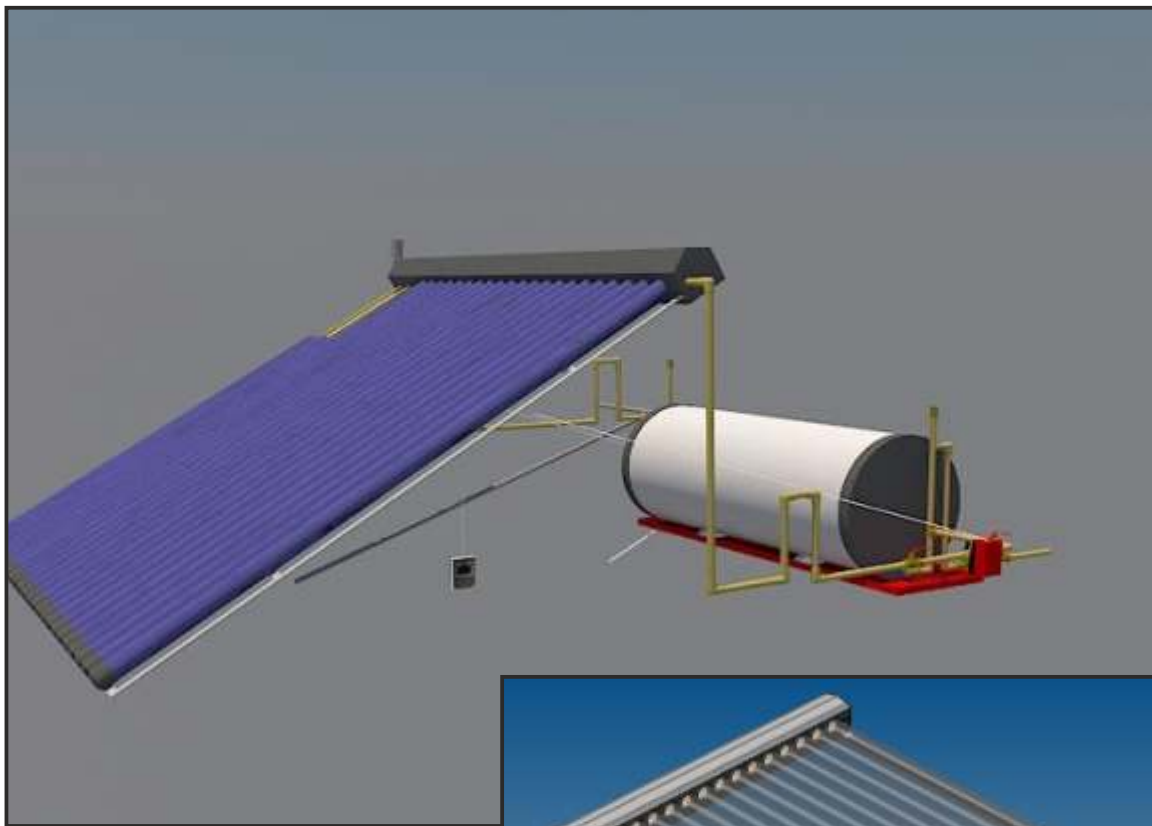




INSTALLATION MANUAL

Installation Manual **PZ-e** -Series / Retrofit Active Geyser Conversion





INSTALLATION MANUAL

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Components:

- 1 x E-Series Collector (Kit Dependant)
- 1 x Mounting Kit
- 1 x Solar TP Valve
- 1 x 12v DC Solar Pump
- 1 x Geyser wise Max (Differential Controller)
- 4 x 22mm Aircon Spec Lagging



INSTALLATION MANUAL

Thermal Properties:

Powerz-On PZ-E16 Solar Collector - Pending Kw/m²/Day

Technical Specifications:

System Specifications							
Í ÖB	System	Collector	Geyser	Volume	FOÖP ÖMÖÖ Type	Transfer Type	Freeze Resistance
1	K-150R E16	PZ-E16	Kwikot	150	Pumped	Direct	Yes

POWERZON
PZ-E16



System Application:	Sys	Pumped
Aperture area:	m ²	1.588 (16 x 58mm x 1720mm)
Total collector size: (outer frame)	m ²	2.73
Pipe connections:	mm	22mm copper
Number of Ports:	No.	2
Freeze Protection:	NO	Yes
Dimensions: (D x W x H)	mm	2000 x 1365 x 150
Working pressure:	kpa	400
Glazing: (tempered / toughened)	mm	4 (Low Iron Toughened)
Insulation materials:	type	Mineral Wool
Frame materials:	type	Extruded Aluminium
Absorber coating:	type	Specially formulated triple laired Coating
Number of tubes:	Qty	16
Glass thickness:	Qty	2.3mm (+/- 0.1mm)
Installation footprint: (D x W)	mm	2000 x 1472
Internal volume:	L	1.242
Dry weight:	Kg	59.71
Filled weight:	Kg	60.95
Packaged dimensions: (D x W x H)	mm	320x280x1930 + 1500x140x140 + 2000x50x50
Recommended standard capacity:	L	150 (Geyser)
SABS Q-factor:	MJ	Pending
Total & Use full Energy:	KW	Pending Kw m ² /Day

Freeze Resistance:

Please Note this system is rated as Freeze Resistant, but requires the function of a Differential controller. If the differential controller fails there will be no freeze protection.

Hail Resistance:

The Powerz-On Flat Plate collector has been tested and is rated as being Hail Resistant. Should the Glass break in hail conditions, please record the details and contact your installer.

Before You Begin

Site Assessment:

1. Check condition of roof structure.

- 1.1 Is the roof strong enough. (Do not Install if in doubt.)
 - 1.1.1 Bare in mind the average 150L Thermosiphon System will weigh about 250Kg.
- 1.2 We recommend consulting a structural engineer before beginning.
- 1.2 What type of roof (Tile, Corrugated, Flat.)(Appendex A)
- 1.3 Is there any existing damage. **NB.: If there is, you must point it out to the client before you begin.** (If need be, photograph the damage)

3. Inclination:

- 3.1 The Solar collector should be raised as close to 36° (Gauteng) as possible.
(Inclination = Latitude + 10°)(Eg.: Gauteng = Latitude 26° + 10° = 36°)
- 3.2 What type of frame will you need.
- 3.3 How much will you need to raise the collector by, to reach the correct installation angle.

4. Direction:

- 4.1 The Solar collector should face North, with a slight bias toward the West.
(this is so we can collect more Sun in the afternoon)
- 4.2 Is there a side of the roof structure that will be acceptable.

5. Once you have decided on the location, it is advisable that you erect the unit in place **without** securing. Once you have done this, ask the client if they are happy with the location.

6. Safety Precautions:

- 6.1 Ensure the Electrical supply to the Geyser is switched off.
- 6.2 Ensure there is sufficient light to be able to clearly see what you are doing.
- 6.3 Check condition of the roof thoroughly before attempting any installation.
- 6.4 Ensure all Ladders or other forms of rigging is well secured.
- 6.5 Be careful of spills, surfaces may become slippery.
- 6.6 Wear appropriate clothing for the conditions.
- 6.7 Ensure all Plumbing & Electrical connections are well secured before continuing to the next operation.

Please Ensure the Geyser Installation complies with SANS 10254 Regulations before you begin.

Once you have decided on the location and had it approved by the client you may begin.



Appendix 1.

How to Secure to the Roof (Types)

1.1. **Tile.**

- With a tiled roof it will be more difficult to drill the holes for the tubing.
- When you do, drill a small hole (10mm) then enlarge it to the size you require.
- Do not use the hammer function on your drill.
- To secure the Collector, use hope iron. Slide the hope iron under a tile and secure to the brandering.
- When you arrive on site ask if the client has spare tiles, incase you break any while you are working on the roof.

1.2. **Corrugated iron.**

- Corrugated iron is the easiest roof to work on, look out for rust or weak areas.
- Drill holes with a hole saw.
- To secure, use nuts & bolts.
- Make sure you silicon all the holes very thoroughly.

1.3. **Slate.**

- With a Slate roof it is even more difficult to drill the holes for the tubing.
- When you do, drill a small hole (10mm) then enlarge it to the size you require.
- Do not use the hammer function on your drill.
- To secure the Collector, use hope iron. Slide the hope iron under the Slate and secure to the brandering.
- When you arrive on site ask if the client has spare Slate tiles, incase you break any while you are working on the roof.

1.4. **Flat Roof.**

- A frame for the collector will be required to raise the Solar Collector to the correct inclination.
- Make sure nothing punctures the waterproofing on the roof while you are working.
- The frame will need to be secured to the side of a wall or parapit.
- All tubing will need to be run to the side of the building, NOT through the roof (that will damage the water proofing)

1.5. **Thatch.**

- NO GO!!. You can't install on thatch. Thatch needs to breathe, so anything directly on the thatch will cause rot.
- You cannot float the Collector above the roof either, any holes you make for the tubing or reinforcement will leak.
- The only way to do this is to mount the system on a wall on the side of the building, or on the ground.
- You will need to run tubing to the house either way.

Appendix 2.

Frost Protection:



If Your Collector looks like the one on the Right you may be in Trouble!!

2.1 Principles and Facts

At sea level freezing occurs at 0°C. For our purposes and to be on the safe side we will work with 4°C as being the start of the freezing process.

The temperature at which water freezes also depends on the impurities in the water.

What happens when Water freezes:

- water starts freezing at 4°C
- when water changes to ice it expands
- copper pipes do not expand at freezing point but shrink!
- Final Conclusion: Copper will not be able to withstand the pressure from the expanding Ice.

2.2 Freeze Prevention

Active System:

- On the Active System the water will be circulated at a specific temperature (4°C)
- This is the function of the Differential Controller,
- Some Differential Controllers Require that this Function be Activated Manually.

NB.: Please make sure the function is activated!!

Thermosiphon Systems:

- In Thermosiphon systems the coldest water (4°C) will be released through a dump valve.
- The Dump Valve must be placed at the lowest point of the collector

NB.: We recommend installing a Dump Valve in Active Systems for added Protection.

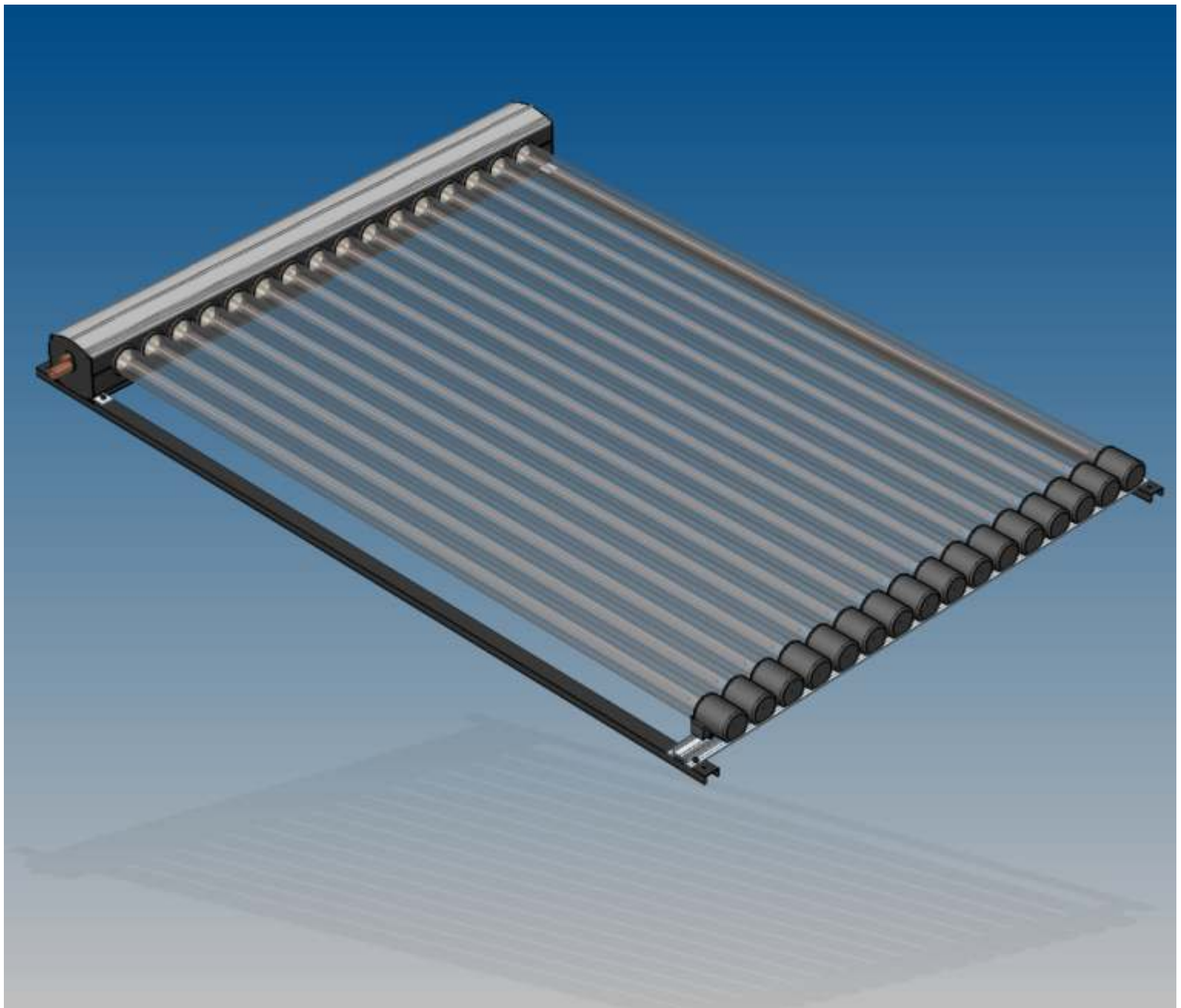


INSTALLATION MANUAL

Appendix 3.

Assembly Manual Powerz-On Evacuated Tube Collectors

Revision 1 - 16/01/2014



Instructions for the Safe and Correct Assembly of the Powerz-On E-Series Solar Collector



INSTALLATION MANUAL

MANUFACTURING THE FUTURE
Components



- 1x Manifold (Systems Size Dependant)(1.)
- EVT Cups quantity Systems Size Dependant. (2.)
- 2x Frame Side Rails. (3.)
- 1x Frame Bottom Rail.(4.)
- Box of EVT Tubes (Systems Size Dependant)(5.)
- 12x M5x15 Bolt
- 12x M5 nut
- 1x Thermal Transfer Paste

Optional:

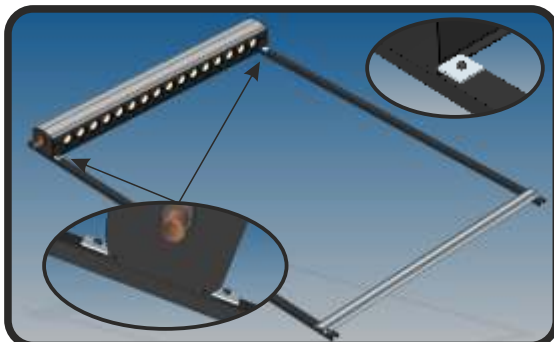
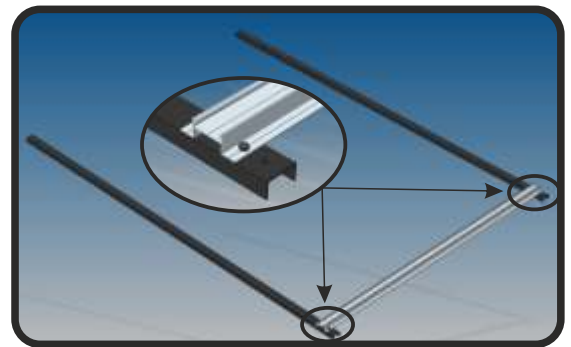
- 1x Flat Roof Stand

Assembly Process

Step 1.

Using 4x M5 Bolts & Nuts connect the side rails to the bottom rail. (as shown)

Note.: the side rails have a top and bottom.



Step 2.

Using 4x M5 Bolts & Nuts and 4x connector clips connect the manifold to the frame. (as shown)

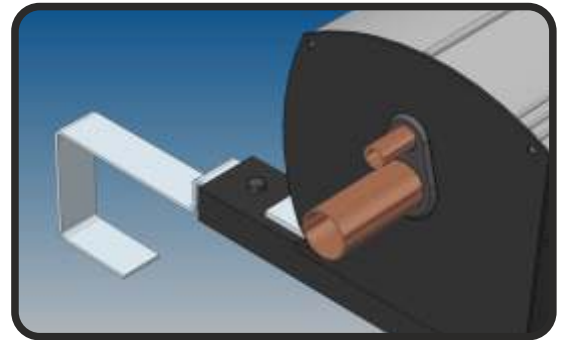
NB.: Do not tighten the nuts and bolts as you will need to adjust the manifold for the length of the Evacuated tubes.



INSTALLATION MANUAL

Step 3.

Using 4x M5 Bolts & Nuts and 4x pieces of hoop-iron (not supplied) secure the collector to the roof in the correct place following the correct procedure.



NB.: do not install the Evacuated tubes until all the pipe work is complete and the system is charged (Full of water)

Step 4.



NB.: Only take one EVT out of the box at a time, the Probe heats up very fast.

Using the Thermal Transfer paste (TTP) extend the collector probe and apply the "TTP" to the probe. Insert the probe into the manifold as far as it will go. Push the EVT as far as

possibly into the manifold.

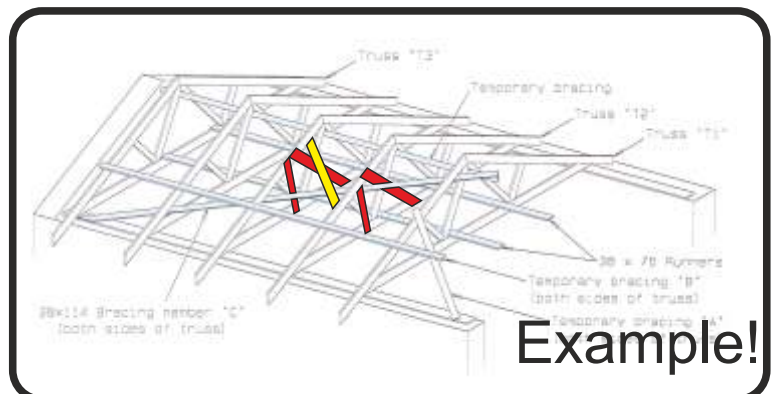
Rotate the EVT Cup into place, close the lid of the Cup and adjust the adjuster till secure.



Repeat the process until all Tubes are in place and secure.

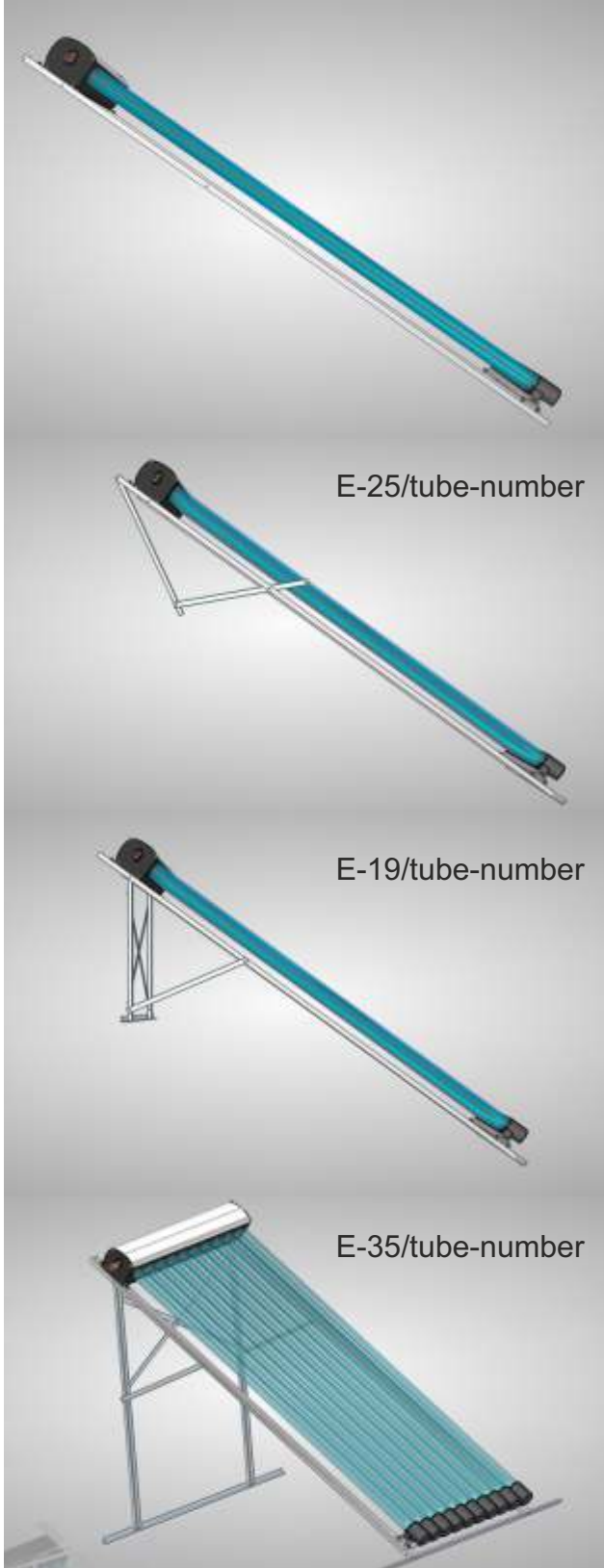
Step 5 - Positioning and re-enforcing the Roof.

1. Make sure the frame is situated across at least two roof trusses.
2. Once the frame is in place, and all nuts and bolts are properly secure, you may secure to roof.
3. Ensure strengthening is added to the trusses carrying the weight. See example.
2. Slip Hoop Iron under the tile and secure to roof truss.
3. Secure the same hoop iron to the frame, make sure all four corners of the frame are secured in this manner.



Appendix 4.

Stand Selection:



31° or more roof inclination requires no additional stand

25° to 30 ° roof inclination requires the addition of an E-25/tube-number stand.

19° to 24 ° roof inclination requires the addition of an E-19/tube-number stand.

Flat roof Installations requires the addition of an E-35/tube-number stand.

Please refer to stand assembly instructions



Installation Procedure

1. Preparation:

1.1 Turn off the Electricity to the Geyser at the DB board and at the switch by the geyser
NB: Test with a multimeter before you work on the Electrical supply.

1.2 Turn off the cold water feed to the Geyser.

1.3 Drain the Geyser.

- a: Open the drain-cock
- b: Open the closest hot water Tap to the Geyser.
- c: Remove one Vacuum Break valve.



2. Installing & Securing the Solar Collector:

2.1 Please refer to Appendix 4. for Roof Stand requirements.

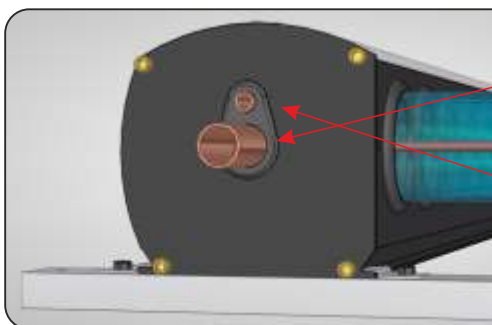
2.2. **ASSEMBLE** the Powerz-On Solar Collector. (Refer to Appendix 3)

2.3 **SECURE** the collector to the roof (Refer to Appendix 1)

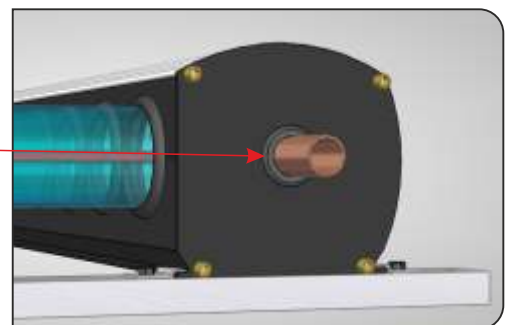
2.4. **Pipe work for Collector.** Drill two holes in the roof for the Send & Return 22mm Copper tubing & one 6mm hole for the sensor wire.

- a: **Send** = Left of manifold (Cold water feed) (Use 22mm Conex 90° elbow fitting)
- b: **Return** = Right of manifold (Hot water return) (Use 22mm Conex 90° elbow fitting)
- c: **Sensor** = Right of manifold
- d. Place a piece of 22mm copper tubing in the holes, so you can see it from inside.

NB.: Once the Piping is connected through the Roof, waterproof all the holes thoroughly.



Right - Return
Left - Send
Sensor





3. Connecting the Plumbing

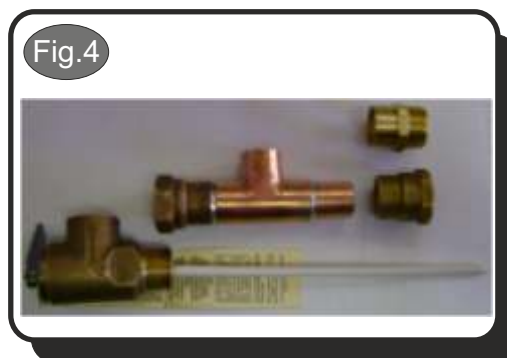
Cold Water Supply - Send Side: (Fig.6)

- 3.1 Cut the Cold water feed pipe as close to the Geyser in-let as possible. (Fig.2)(3.a)
- 3.2 Add a tee connector at the cut. (22mm Solder tee Connector)(Fig.2)
- 3.3 The new feed is to supply water to the bottom of the Powerz-On Solar Collector, and incorporates the Pump & Ant-Siphon loop.

NB.: Lagge all piping before you secure any fittings.

- 3.4 **The Pump:** (**NB.:** the pump must never be run with out water) (Fig.2)
 - 3.4.1 Must be placed in a horizontal position, with the flow arrow facing away from the Geyser.
 - 3.4.2 The pump must be placed on its side. (This ensures the pump will be full of water)
 - 3.4.3 Connect the wiring to the pump before the pump is installed.
(Allow sufficient 2 core flex to run to the Controller)
 - 3.4.4 The pump should be placed as close as possible to the Geyser.
 - 3.4.5 Add an anti-syphon loop after the Pump (Fig.6.2)
 - 3.4.6 12 v pumps are polarity sensitive, make sure you connect the power correctly
- 3.5 Complete the 22mm copper tubing to the bottom of the Powerz-On Solar Collector
(Remember the Lagging)

NB.: 15mm Copper tubing can be used on the solar loop if required.



4. **Hot Water Return - return side (Fig.7)**
Connecting the TP Solar Conversion Valve & anti-syphon loop:
- 4.1 Disconnect the over flow pipe, and remove the existing TP Valve.
 - 4.2 Insert the new TP Valve (Fig.3) & reconnect the overflow pipe.
(use a male to female thread converter if required).
 - 4.3 ALTERNATIVE: Connect the solar TP valve (Fig.4) Using: Female Geyser Connection to 22mm Tee Piece to male/female Geyser Connection. (Geyser dependant)
(Please Solder all connections before inserting the TP Valve)
 - 4.4 Install an anti-syphon loop after the Solar TP Valve
 - 4.6 Complete the tubing to the right of the Powerz-On Solar Collector.
- NB.:** Don't forget the lagging.

5. Refill the Geyser:

- 5.1 Close the hot water taps.
- 5.2 Close the drain-cock
- 5.3 Re-install the Vacuum Break.

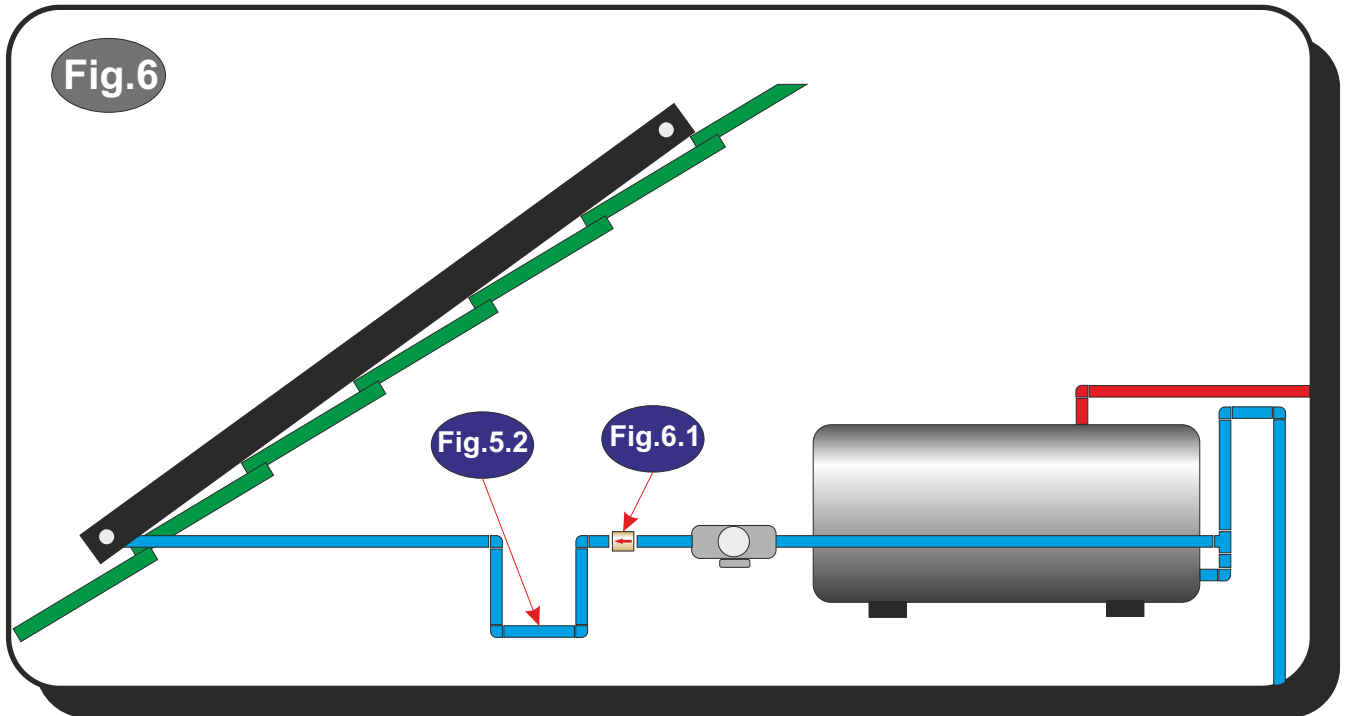
NB.: Check for any leaks.

NB.: MAKE SURE ALL HOLES THROUGH THE ROOF ARE WELL SEALED.

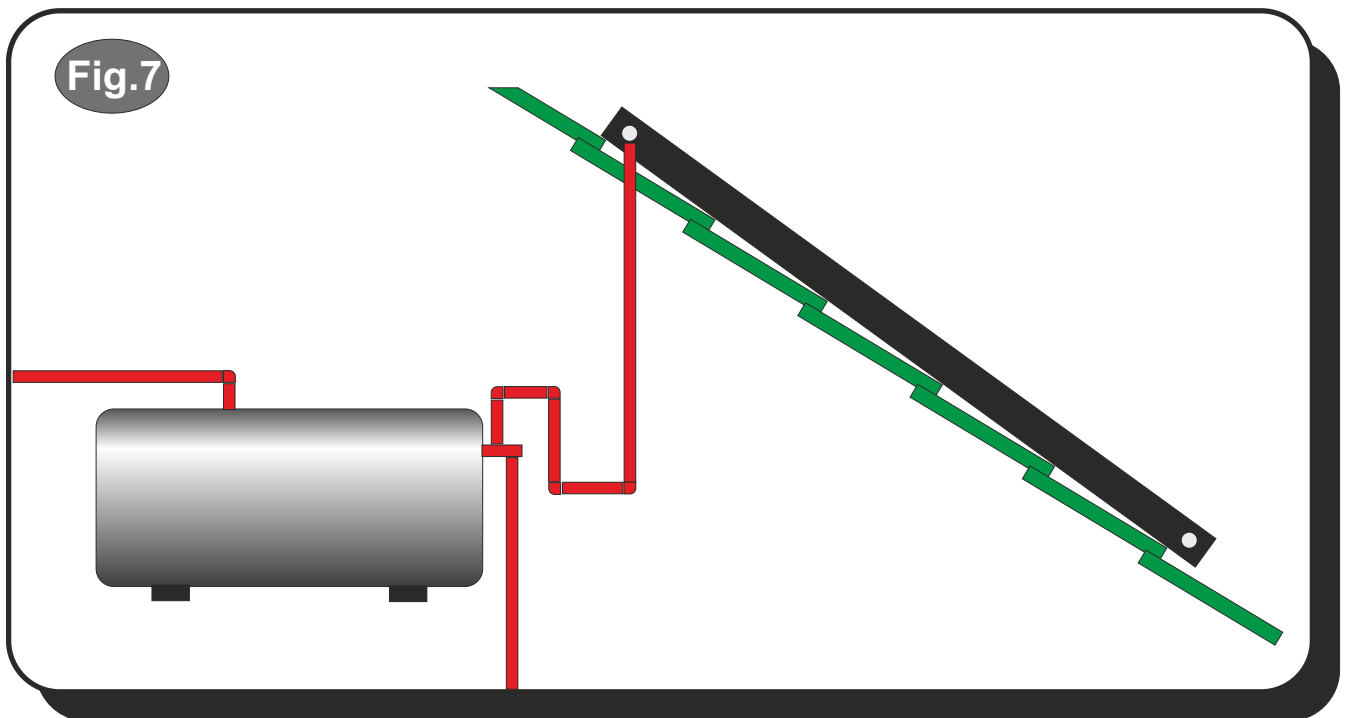
ONCE THE SYSTEM IS FULL OF WATER, YOU CAN BEGIN INSTALLING THE EVACUATED TUBES - SEE APPENDIX 3. FOR INSTRUCTIONS.

THE PLUMBING SIDE OF THE INSTALLATION IS COMPLETE

Cold Water Send - send side



Hot Water Return - return side



NOTE: THE ABOVE DIAGRAMS ARE SOLAR LOOP ONLY



INSTALLATION MANUAL

5. Electrical Components:

NB.: We recommend this section is completed by a Qualified Electrician.

Powerz-On recommends using a Geyser Wise Max differential controller

Installation & Configuration:

Please Refer to the Installation Manual provided with the Deferential Controller.

A simple wiring diagram is inclosed.

- Geyser Wise Max

Once the Geyser is Full and All Electrics have been checked, you may commission the Solar System.

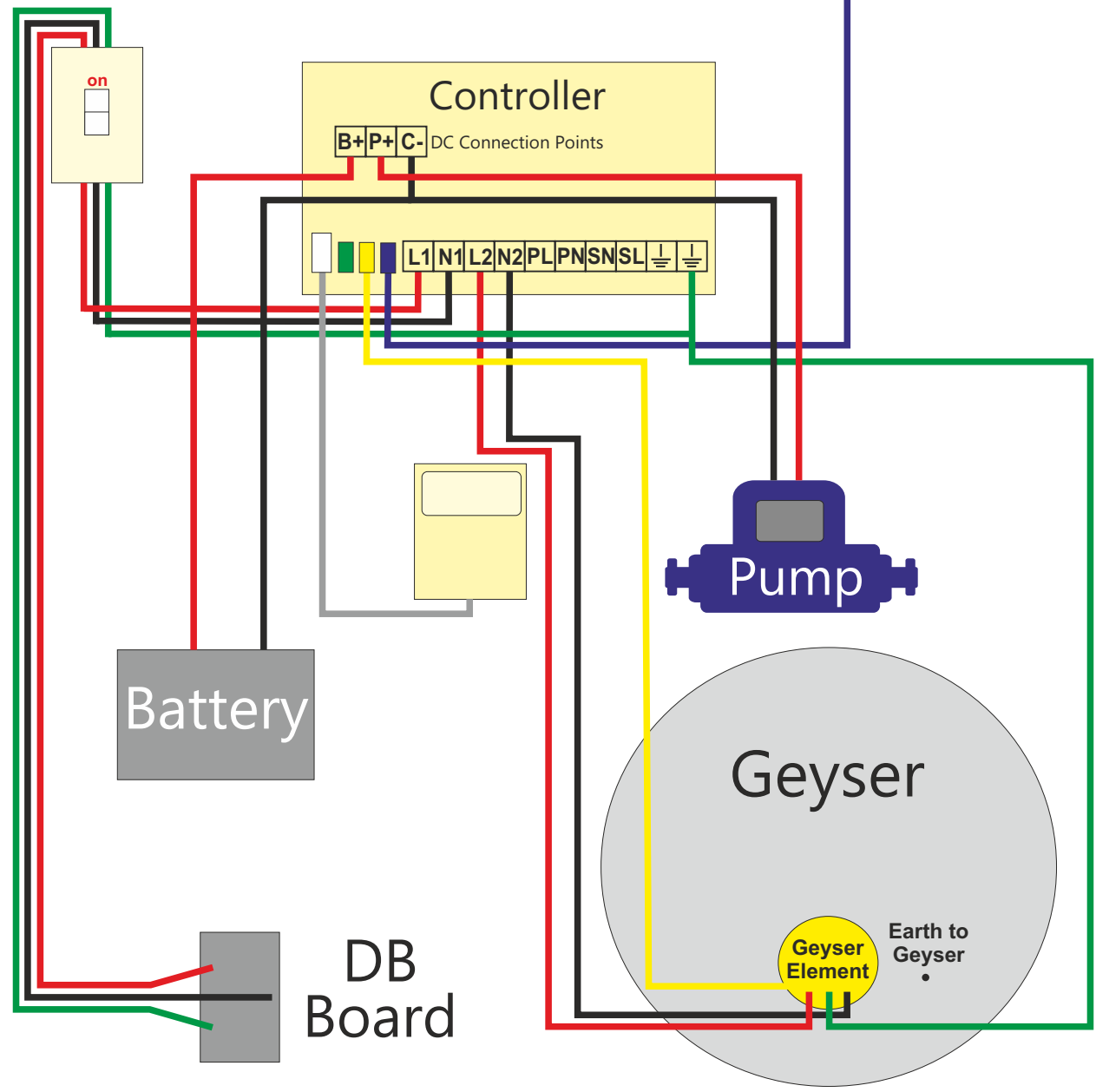
Before Leaving Please make sure the controller is correctly programmed, and the client has had the system explained to them.



INSTALLATION MANUAL

Solar Panel

Isolator Switch



KEY

- Live
- Neutral
- Earth
- LCD Display Cable
- Geyser Sensor
- Collector Sensor

GEYSER WISE MAX



Safe Operation of the System:

- 1. The system being a thermosiphon system relies on the natural process of water being heated by the Sun natural rises to the highest point of the system and is replaced by the cooler water in the same system.*
- 2. This being a natural process, it will continue as long as the sun supplies sufficient energy to heat the water. No mechanical assistance is required.*
- 3. Should the system be left for 4 or more consecutive days in high summer, it is possible that the system could over heat and become unstable, it is recommended that should the system not be used for 3 or more days, the collector be covered, to reduce the likelihood of the system over heating.*
- 4. The system topical takes a full day to heat the water in the geyser to a decent temperature. This is not an instant process but rather requires the full day on average. The ultimate temperature is determined by Usage and the energy of the Sun.*
- 5. Once the water has been heated by the Sun, and once you have depleted such water, either you will have to wait for the Sun to reheat the system, or you will need to activate the electrical element if more hot water is needed urgently.*
- 6. It is recommended you take this into account when using hot water, do not let the hot water simply run for no reason, showering using a low flow shower head can reduce your hot water usage bu up to 50%*
- 7. The electrical element consumes a large amount of electricity when it is active, it is recommended the use of the element be kept to the absolute minimum, by doing this your potential energy saving will be maximised. We recommend activating the element in the early hours of the morning, which would allow for normal early morning requirements, thereafter allow the Sun to provide the rest of the heating during the day.*
- 8. For maintenance and other safety information please refer to the section on Maintenance.*



Maintenance:

1. *If at any time you suspect a leak or problem with the system please call your Installer immediately.*
2. *In-Land Areas:* The Solar Collector should be kept free from dust or pollen.
3. *Coastal Areas:* The Solar Collector should be kept free from salt crystallization. Collector must be Anodized for corrosion protection.
3. The anti-freeze fluid (Glycol) will degrade over time. The Collector and piping should be drained and refilled every (3) three years.
4. The entire system should be checked periodically for any leaks or problems. If you suspect a problem the Installer should be contacted immediately.
5. We recommend the thermostat in the Geyser be set to 55°C.
6. Never allow trees, shrubs or other large obstacles to cast a shadow on the solar collector. Please check during summer and winter.
7. Please Refer to Geyser Manufacturer of Anode Replacement (on Average replace every 18 Months)
8. Winter Time:
 - 8.1 Active Systems: Make sure the Frost protection system is activated.
 - 8.2 Make sure all Piping is Insulated.

Away Periods

When in summer, hot water is not going to be used for weeks, it is advisable to cover the panel(s) with a canvas or an old blanket (NOT WITH BLACK PVC!). This will prevent the system from over-heating.

Once a Year

The temperature and pressure valve(s) should be checked for proper operation. **This should be done by an accredited technician.**

NB.: It is also recommended that a Qualified Installer performs a full system check-up once a year, this will allow the system to perform at its fullest at all times.



INSTALLATION MANUAL

Powerz-On Warranty

Powerz-On gives the buyer the assurance that all components of the Solar System supplied by Powerz-On have been tested both as individual components and as a part of an integrated system. The system complies with all the relevant SANS requirements and carries the SABS mark of Approval.

- Please Note:**
1. All installations must be carried out by, and signed off by a Powerz-On accredited Installer. Failure to do so will render the Warranty Null and Void.
 2. All installations must comply with SANS 10106.
 3. The Powerz-On Warranty applies to the Powerz-On Collector only, all other components supplied by, but forming part of the system, but not manufactured by Powerz-On carry their own Warranty provided by their respective Manufacturers.

Warranty:

The Powerz-On Solar Collector comes with a comprehensive one (1) year parts and labour warranty and guarantee to replace the Solar Collector if the Collector fails within five (5) Years.

5 Year Replacement Guarantee:

Powerz-On will provide a free replacement Solar Collector from it's nearest branch office or approved agent. Under this replacement guarantee, the transport, installation and labour costs of delivering the replacement Solar Collector and removing the existing Solar Collector and installing the replacement Collector, will be for the account of the owner of the existing Solar Water Heater.

Where a Solar Collector or a component of the solar system is replaced, the balance of any original Warranty or Replacement Guarantee period will remain effective. The replacement Solar Water Heater or part does not carry any additional warranty or replacement Guarantee.

The period of Warranty is from date of Installation providing the documented proof of Installation and sale is furnished, or alternatively from date of manufacturer as determined from the serial plate code on the Solar Collector. The following conditions apply.:

1. The Warranty only applies to defects, which have arisen solely due to faulty materials or workmanship during the manufacturing process of the Solar Collector.
2. The Solar Collector Glass is not covered by the Warranty. Manufacturers Defects Excluded.
3. Any Freeze damage caused as a result of the Solar Collector being installed as a direct system in frost areas, is not covered by the Warranty.



INSTALLATION MANUAL

4. Frost protection in the Pumped Direct system is dependant on an electrical supply. Any frost damage resulting from loss of, or intermittent Electrical supply, is not covered by the warranty.
5. Any damage caused to the Solar Collector due to propylene glycol not being used, or the propylene glycol failing in the Indirect System, is not covered by the Warranty.
6. Any damage caused to the Solar Collector due to improper installation, or modifications made to the Solar Collector, is not covered by the Warranty.
7. Any damage caused due to an act of nature, is not covered by the Warranty.
8. Any damage caused due to Collector over heating is not covered by the Warranty.
Note: If Collector temperature exceeds 100°C, permanent damage can occur.
9. Any damage caused to the Solar System due to water quality being outside the chemical parameters stated below, is not covered by the Warranty.:

PH	6.5-8.5
Total dissolved solids	600 mg/L
Calcium coronate level (Hardness)	200 mg/L
Chlorides	250 mg/L
Magnesium	10 mg/L

The Warranty on the Installation is the responsibility of the Installer. The System must be installed in compliance with SANS 10106.

Safety:

1. Do not tamper with any part of the installation.
2. Do not touch the Hot supply pipe from the Solar Collector/s, as this pipe can get extremely hot.
3. The Draining and Replacing of the heat transfer fluid (Glycol) must be carried out every three (3) years, and must be done by an authorized Powerz-On Installer.

Emergency and Shutdown Procedures:

In the event of a problem arising with the Solar Water Heater, the following procedure should be followed.

1. Switch off the Geyser at the electrical distribution board (DB board).
2. If there is any evidence of a water leak from any part of the system, shut off the water supply to the Solar Water Heater, at the shutoff valve before the Solar Water Heater, or at the mains water supply.
3. If there is any evidence of a heat transfer fluid leak (Glycol) in any part of the system, try and capture the leaking fluid into a bucket or container. Keep the container for inspection by the Installer.
4. Contact the company that installed the Solar Water Heater, or an authorised Solar Water Heater Installer.



INSTALLATION MANUAL

Warranty Activation Form

Please Note: The warranty comes into force when the activation has been registered with Powerz-On Solar Systems. This is the responsibility of the owner of the solar system.
Please E-mail to activate@powerz-on.co.za or Fax to 011 965-0187

Home Owners Details: (to be completed by the Home Owner)

Name: _____
 Physical Address: _____

 Tel (Home): _____ Tel (office): _____
 Cell : _____ E-Mail: _____

Installer Information: (to be completed by the Installer)

Name: _____
 Company Name: _____
 Physical Address: _____

 Tel (office): _____ Cell: _____
 E-Mail: _____

Declaration:

Powerz-On Authorized Installer Certificate No.: _____

I, the above-mentioned Powerz-On Authorized Solar Water Heater installer, confirm that the solar water heater and/or Solar Collector installation carried out by myself, complies with Powerz-On requirements and SANS 10106 Installation Specifications.

Signature: _____ Date: _____

System Description:
(to be completed by the Installer)

Geysers manufacturer: _____

System	Split or Close Coupled		Circulation Method		Tick Appropriate Block
Direct	Split		Pumped		
	Split		Thermosiphon		
	Close Coupled		Thermosiphon		
Indirect	Split		Pumped		
	Split		Thermosiphon		
	Close Coupled		Thermosiphon		
Tank Size:	100Lt.	150Lt.	200Lt.	250Lt.	300Lt.
Tick Block					
Collector:	ST-150	ST-200	ST-300	ST-2.2	ST-2.5
Tick Block					

Installation Date: _____

Collector.

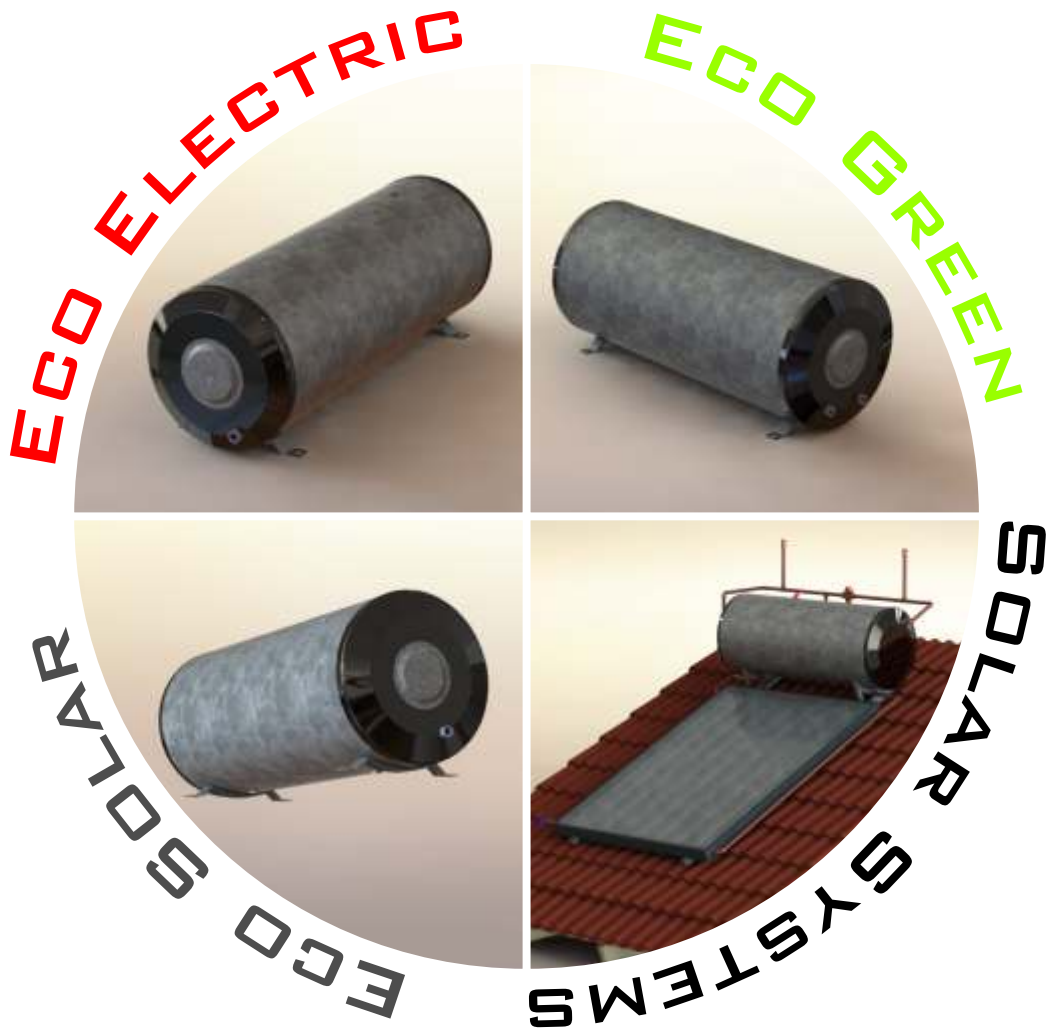
Serial Number: 1. _____ 2. _____

Geyser.

Serial Number: 1. _____ 2. _____



INSTALLATION MANUAL



TEL: +27 11 392-3059
INFO@GAPHOLDINGS.CO.ZA

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