



GeyserWise MAX

Instruction manual



All in one hot water management

Before operating and installation, carefully read all instructions. Do not discard this manual.

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Warranty conditions apply:



1. We, Geysersense CC, warrant to you that, for a period of six months from the date of purchase, the Geysersense MAX Delta "T" all in one Hot Water Management System (the "good") will be free of any defect.
2. If any defect in the good is discovered by you within six months from date of purchase, you can return the good to our service centre or to one of our duly authorised service agents. We will then, at your option -
 1. repair or replace the good; or
 2. refund to you the price paid by you for the good.
3. A good returned under this warranty must be presented to us in its original packaging together with all accessories.
4. We will refuse the return of any good which has been -
 1. partially or wholly disassembled;
 2. physically altered;
 3. used in a manner contrary to any instructions provided by us; or
 4. permanently installed or attached and/or combined with other goods or property in any way.
5. We will not -
 1. repair the good where the defect or damage to the good is found to be a direct result of your negligence, recklessness or malicious behaviour; and/or
 2. be liable for damage caused to the good as a result of wear and tear unless such damage manifests itself -
 1. within 12 months from date of purchase (where the good has been used for normal family, personal or household purposes); or
 2. six months from the date of purchase (where the good has been used for commercial or professional purposes).
6. Where we issue a refund under this warranty, we will deduct the charges we are allowed to deduct under the Consumer Protection Act, No 68 of 2008.

BY SIGNING BELOW, YOU ACKNOWLEDGE THAT YOU HAVE READ AND UNDERSTOOD ALL THE TERMS AND CONDITIONS CONTAINED IN THIS WARRANTY.

Signed at _____ on _____

Components



Control box

The control box is the brain of the system. It performs all the programmed functions and sends instructions to the pump and the element.



Display unit

An array of useful information can be displayed. This includes the temperature of the water in the geyser, the temperature in the collector, whether the pump is running or not, when the element is on, actual hours of electricity used, etc.



Water geyser sensor

The water geyser sensor measures the temperature in the geyser and acts as a thermostat.



Collector temperature sensor and extension cable

Also referred to as a probe, it senses the temperature in the panel and relays the information to the control box via the extension cable.



Water leak detector and extension

This optional addition enables the user to detect when water is dripping into a drip tray by sounding an alarm.



- Water leak detector



- Extension cable

12V link cable

This cable interfaces with a 12V system.



- 12V link cable

Screws

These screws ensure that the cables are securely fastened.



- Screws

Alarm cable

Can be connected to your home alarm and trigger your home alarm when a water leak is detected. A separate zone on your home alarm can be allocated for this purpose.

It is optional to connect the water leak detector to your alarm in this way.





Application

GeyserWise is suitable for installation on electric geysers and thermosiphon and pumped solar hot water heaters.

When installing the GeyserWise be sure to follow the appropriate instructions of each particular manufacturer for all other components as well:

- Installation of geyser.
- Installation of solar collectors.
- Installation of pumps.

Installation

Installation, maintenance and dismantling may only be performed by trained personnel in accordance with this instruction manual and safety instructions.

Use the GeyserWise only after first thoroughly reading and understanding this instruction manual and the safety instructions. In the event of any ambiguities regarding the installation and operation, consult trained personnel or contact our offices.

Technical information

- Operating voltage 230VAC / 50HZ.
- Main relay contact rating 30AMP (**Max 4kW element**).
- Secondary relays pump and solenoid 5Amp.
- Operating voltage range 160V - 250V AC.
- Earth leakage protection at 25mA action time $\leq 0,1$ second.
- Recommended ambient temperatures: -7 - 50°C.
- Temperature display range 0 - 99°C ("-.5" when below -5°C "EA" when above 99°C).
- Temperature setting ranges 30 - 65°C.
- Heat failure - when increase at a rate of 4°C or less per hour.
- Mechanical thermal cut-out 90°C - **Please note this temperature for solar systems expected to reach temperatures higher than 90°C.**
- Dry heat detection - empty cylinder.
- Temperature tolerance $\pm 2\%$.
- Temperature differential setting 1°C.
- Switching differential for the element 6°C.
- 2nd temperature probe for solar.
- Solar differential 7°C (default) - standard system.
- Temperature probe failure detection for both collector and tank.
- Temperature probe range for geyser is -30 to +130°C.
- Temperature probe range for collector is -30 to +260°C
- Isolate both L + N when element in an off state.
- Collector antifreeze protection at 5°C (default) - **Please be sure to use the correct solar systems for frost prone areas. More details can be found on the ESKOM website:**
<http://www.eskomidm.co.za/residential/residential-technologies/step-by-step-guide-to-choosing-a-solar-water-heating-system>

Improper usage

The GeyserWise must not be operated in the following environments:

- Outdoors.
- In damp rooms.
- In rooms in which the operation of electrical and electronic components may be dangerous.

Dangers during installation

- Risk of death by electrocution.
- Risk of fire due to short circuit.

Be sure to follow the below instructions:

- All work on an open GeyserWise must be performed with the mains supply disconnected.
- All safety regulations apply when working on the mains supply.
- Before connecting the GeyserWise, make sure that the power supply matches the specifications on the type plate.
- Factory labels and markings may not be altered, removed or rendered unreadable.
- Make sure that all devices which are connected to the GeyserWise conform to the technical specifications of the GeyserWise.

Exclusion of liability

The manufacturer cannot monitor the compliance to this manual as well as the conditions and methods during installation and operation. Improper installation of the system may result in damage to the property and, as a result, in bodily injury.

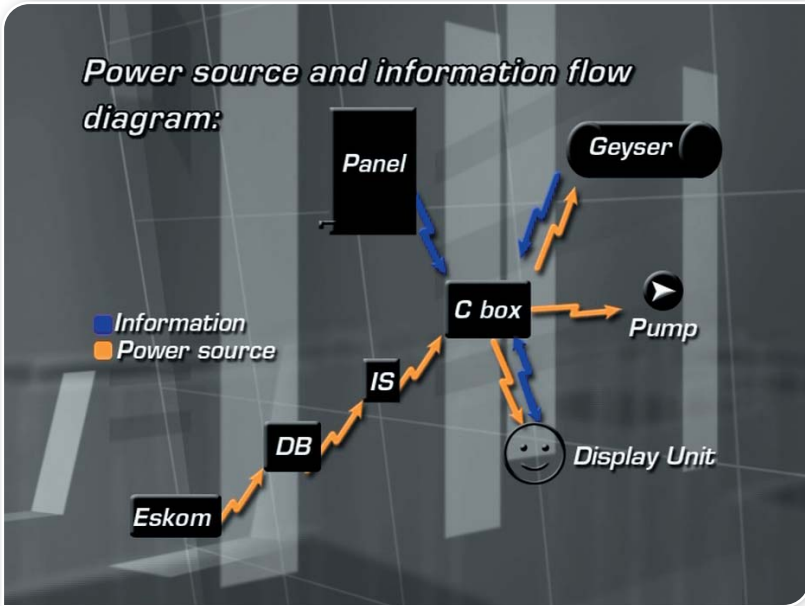
Therefore, we assume no responsibility for loss, damage or costs which result from or are in any way related to incorrect installation, improper operation, incorrect execution of installation work and incorrect usage and maintenance.

Please note that our normal warranty does not cover any natural disasters, for example:

- Flooding
- Lightening
- Earthquakes

The manufacturer reserves the right to make changes to the product, technical data or assembly and operating instructions without prior notice.

220V PUMPED SOLAR SYSTEM



Installation procedure steps

A summary of the installation steps are as follows:


1. Apply all safety measures.
2. Install the control box.
3. Install the display unit.
4. Remove existing thermostat and replace with new supplied thermostat.
5. Install the collector probe.
6. Complete all electrical connections.
7. Set up the controller and all settings.

STEP 1: Apply all safety measures

An installer should always take precautions when working with electricity. The most important safety precautions to perform BEFORE doing any maintenance on a geyser are:


1

Switch off circuit breaker of geyser at main DB. This is done to ensure that there is no power supply to the geyser.




2

Switch off isolator switch in the roof. The isolator switch acts as a switch to isolate both live and neutral from the main supply should someone accidentally switch on the main supply or the circuit breaker fails.



3

Test with a MULTIMETER to ensure that there is no current on the wires. **IMPORTANT!** Make sure that there is no reading on the multimeter



STEP 2: Install control box

Find a dry place near the isolator switch. **The control box must not be exposed to the elements!**

STEP 3: Install the display unit

The display unit must be installed in a location that is accessible to the end user, but not in reach of children that might want to play with it.

The display unit provides valuable information on the functionality and status of your solar system.

Draw the display unit cable from the unit to the control box. Plug it into the three pin plug as provided on the control box. It can only fit into one plug.

The standard display cable of 5m is supplied. Extension cables are available on request from our offices. A maximum extension of 20m is recommended.

Only use GeyserWise extension cables for extensions!!!



STEP 4: Remove thermostat and replace with supplied geyser temperature probe

The geyser's thermostat needs to be removed. The geyser temperature probe provided by GeyserWise has a built in probe that measures the temperature in the geyser. It also supplies information to the element whether it should switch on or not.

The GeyserWise geyser temperature probe incorporates a thermal cut out to prevent electrical overheating. The live feed to the element will be broken at temperatures above 90°C. **Please note this temperature when designing a solar system.** When the cut out switches off, it needs to be reset manually by pressing the red button on the thermal cut out.

1

Remove the existing thermostat by disconnecting all the wires on the connector terminal block of the thermostat.

2

Pull the thermostat out of the pocket.

Please note that certain types of geysers require the user to remove the front part of the geyser temperature probe as provided.

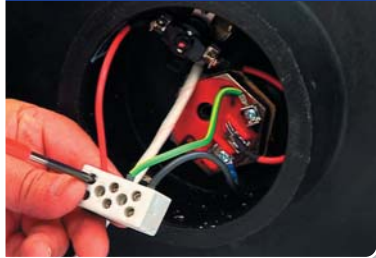
3

Ensure that you insert the geyser temperature probe into the correct pocket.



4

Insert the new geyser temperature probe and connect the live wires once again on the connector terminal block



5

Push the plug connected to the geyser temperature probe through the hole as provided on the geyser.

Plug it into the dedicated plug as provided on the control unit.



STEP 5: Install the collector probe

The function of the collector probe is to measure the temperature of the panel. A critical concept to understand is that heat rises and therefore the warmest part of the collector is at its highest point.



On a flat plate the collector probe must be installed on the return side of the panel at the highest possible point.

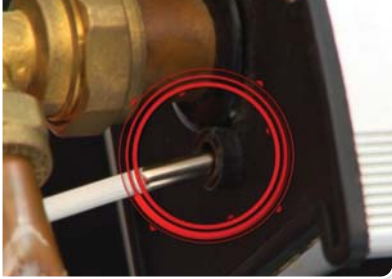


Please note the position of the probe when using a pump for antifreeze, as the temperature at the top of the panel is higher than at the bottom. Always make sure the correct panel for frost prone areas is used and that antifreeze valves are installed. ESKOM also recommends an indirect system for frost prone areas.

The measurement on a lower point will result in an incorrect reading (lower temperature). This implication is that the panel will be warmer than the indicated temperature and therefore stop the pump too soon. **The solar system will not be functioning optimally!**



On an evacuated tube collector a sleeve is normally provided on the **return** side to install the probe.



You will be supplied with an extension cable. Do not use any other extension than the extension cable provided.



Connections on control box summary



STEP 6: Complete all electrical connections

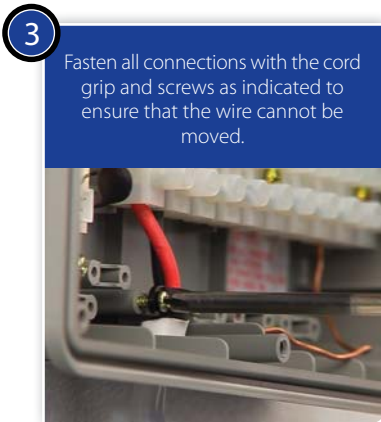
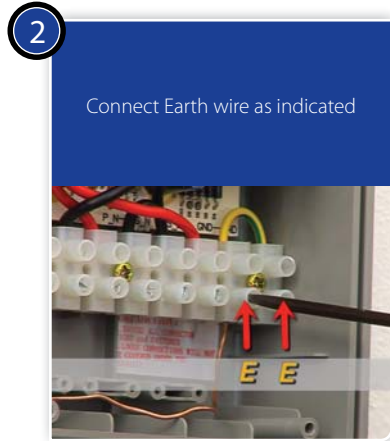
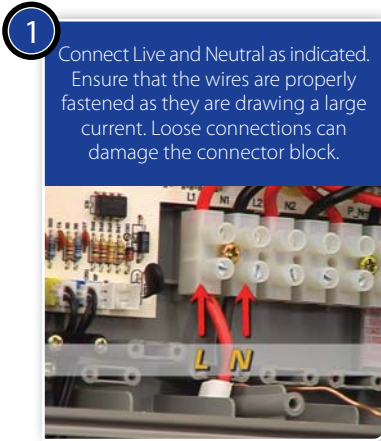
The hard wiring of a controller is critical.

Main power supply

The main power supply is provided from the isolator switch.

- The **Red** wire is your **Live** wire.
- The **Black** wire is your **Neutral**.
- The other wire provided is your **Earth**.

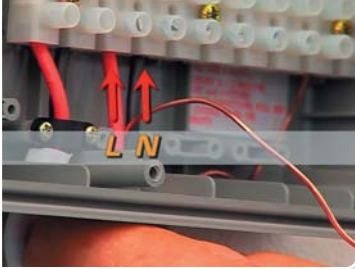
Each control box has knock outs at the bottom of the unit. To make an entry into the control box, just remove the knock out.



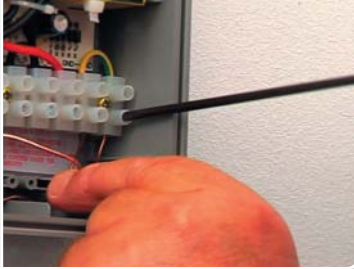
Connect wire between controller and geyser

Note: Ensure that a wire is used that complies with the requirements of SANS 10142.

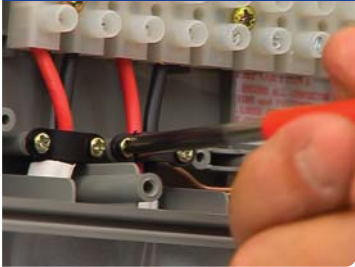
1 Connect Live and Neutral as indicated. Ensure that the wires are properly fastened as they are drawing a large current. Loose connections can damage the connector block.



2 Connect Earth wire as indicated.



3 Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.



4 Connect wires to geyser's connector block.

5 Connect Live, Neutral and Earth as indicated.

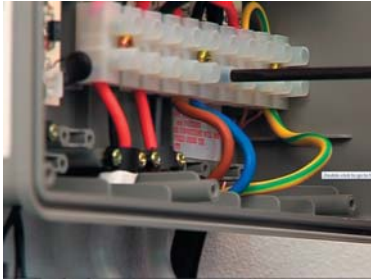


6 Replace cover of geyser to protect the electrics.



Connect wire between controller and pump

1. Connect Live (Brown) and Neutral (Blue) as indicated. Ensure that the wires are properly fastened both sides of the terminal block as they are drawing a large current. Loose connections can damage the connector block.



2. Connect Earth (Green/Yellow) wire as indicated.
3. Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.

Connect leak detector (optional)

1. Push wire through the hole as provided.
2. Plug into green socket as provided on control box.



3. Plug leak detector onto lead wire.
4. Place detector in drip tray of the geyser.
5. An alarm will sound to indicate that there is water in the drip tray of the geyser.

Replace lid on control box and fasten properly.

Before you replace the lid it is important to do a final check on the electrics by comparing it to the wiring as indicated on the lid.

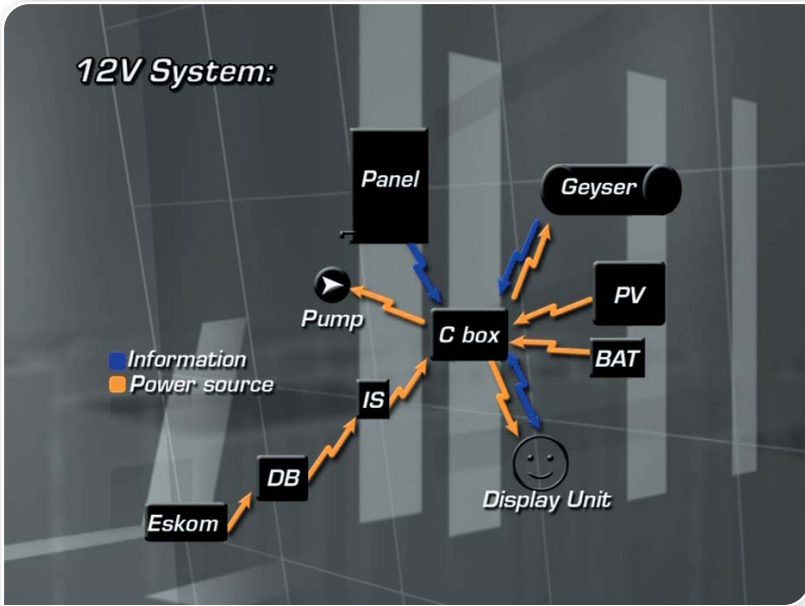
Power up system

1. Switch on main supply at DB board.
2. Then switch on power at isolator switch.

Summary



12V PUMPED SOLAR SYSTEM



Installation procedure steps

A summary of the installation steps are as follows:


1. Apply all safety measures.
2. Install the control box.
3. Install the display unit.
4. Remove existing thermostat and replace with new supplied thermostat.
5. Install the collector probe.
6. Complete all electrical connections.
7. Set up the controller and all settings.

STEP 1: Apply all safety measures

An installer should always take precautions when working with electricity. The most important safety precautions to perform BEFORE doing any maintenance on a geyser are:


1

Switch off circuit breaker of geyser at main DB. This is done to ensure that there is no power supply to the geyser.



2

Switch off isolator switch in the roof. The isolator switch acts as a switch to isolate both live and neutral from the main supply should someone accidentally switch on the main supply or the circuit breaker fails.



3

Test with a MULTIMETER to ensure that there is no current on the wires. **IMPORTANT!** Make sure that there is no reading on the multimeter



STEP 2: Install control box

Find a dry place near the isolator switch. **The control box must not be exposed to the elements!**

STEP 3: Install the display unit

The display unit must be installed in a location that is accessible to the end user, but not in reach of children that might want to play with it.

The display unit provides valuable information on the functionality and status of your solar system.

Draw the display unit cable from the unit to the control box. Plug it into the three pin plug as provided on the control box. It can only fit into one plug.

The standard display cable of 5m is supplied. Extension cables are available on request from our offices. A maximum extension of 20m is recommended.

Only use GeyserWise extension cables for extensions!!!



STEP 4: Remove thermostat and replace with supplied geyser temperature probe

The geyser's thermostat needs to be removed. The geyser temperature probe provided by GeyserWise has a built in probe that measures the temperature in the geyser. It also supplies information to the element whether it should switch on or not.

The GeyserWise geyser temperature probe incorporates a thermal cut out to prevent electrical overheating. The element will automatically switch off at electrical temperatures of 90°C. **Please note this temperature when designing a solar system.** When the cut out switches off, it needs to be reset manually by pressing the red button on the thermal cut out.

1

Remove the existing geyser temperature probe by disconnecting all the wires on the connector terminal block of the thermostat.

2

Pull the thermostat out of the pocket.

Please note that certain types of geysers require the user to remove the front part of the geyser temperature probe as provided.

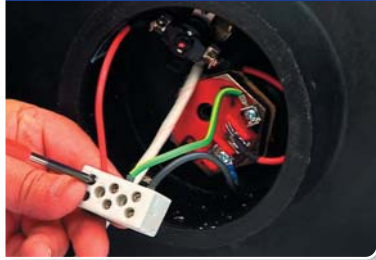
3

Ensure that you insert the geyser temperature probe into the correct pocket.



4

Insert the new geyser temperature probe and connect the live wires once again on the connector terminal block



5


Push the plug connected to the geyser temperature probe through the hole as provided on the geyser.

Plug it into the dedicated plug as provided on the control unit.



STEP 5: Install the collector probe

The function of the collector probe is to measure the temperature of the panel. A critical concept to understand is that heat rises and therefore the warmest part of the collector is at its highest point.




Collector Probe

On a flat plate the collector probe must be installed on the return side of the panel at the highest possible point.



Please note the position of the probe when using a pump for antifreeze, as the temperature at the top of the panel is higher than at the bottom. Always make sure the correct panel for frost prone areas is used and that antifreeze valves are installed. ESKOM also recommends an indirect system for frost prone areas.

The measurement on a lower point will result in an incorrect reading (lower temperature). This implication is that the panel will be warmer than the indicated temperature and therefore stop the pump too soon. **The solar system will not be functioning optimally!**



On an evacuated tube collector a sleeve is normally provided on the **return** side to install the probe.



You will be supplied with an extension cable. Do not use any other extension than the extension cable provided.



Connections on control box summary



STEP 6: Complete all electrical connections

The hard wiring of a controller is critical.

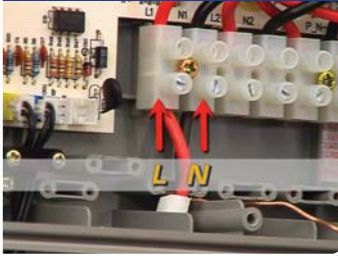
Main power supply

The main power supply is provided from the isolator switch.

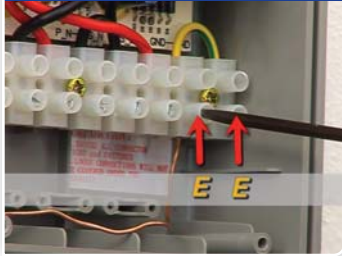
- The **Red** wire is your **Live** wire.
- The **Black** wire is your **Neutral**.
- The other wire provided is your **Earth**.

Each control box has knock outs at the bottom of the unit. To make an entry into the control box, just remove the knock out.


1 Connect Live and Neutral as indicated. Ensure that the wires are properly fastened as they are drawing a large current. Loose connections can damage the connector block.



2 Connect Earth wire as indicated



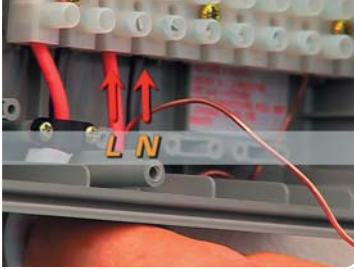
3 Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.



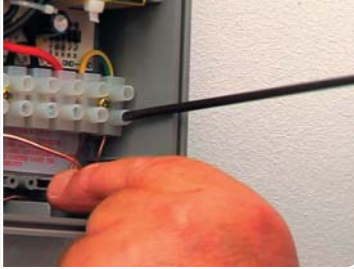
Connect wire between controller and geyser

Note: *Ensure that a wire is used that complies with the requirements of SANS 10142.*

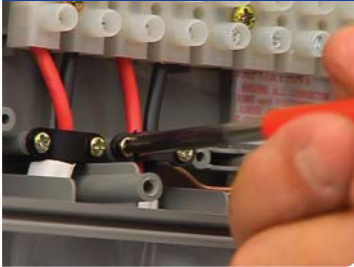
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2 Connect Earth wire as indicated.

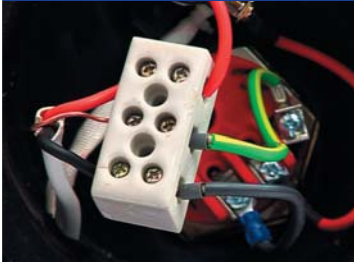


3 Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.




4 Connect wires to geyser's connector block.

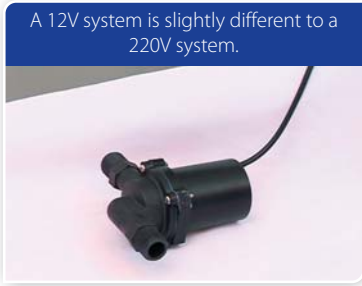
5 Connect Live, Neutral and Earth as indicated.



6 Replace cover of geyser to protect the electrics.

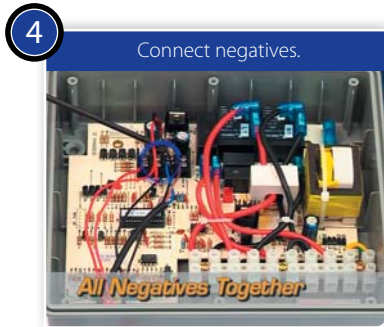
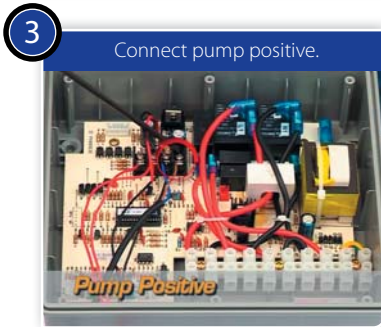
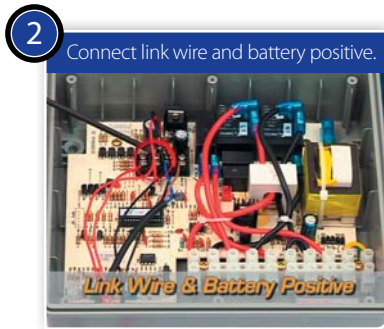
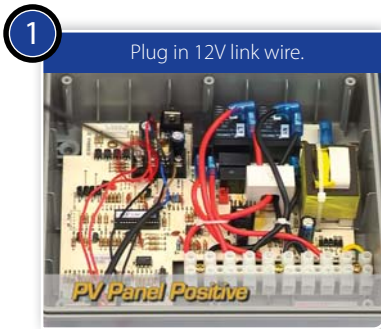


Connect the pump, PV panel and battery



It is important to note that 12V systems are polarity sensitive. It is therefore important to check the polarity with a multimeter before you commence with an installation.

Steps



Connect leak detector (optional)

1. Push wire through the hole as provided.
2. Plug into green socket as provided on control box.



3. Plug leak detector onto lead wire.
4. Place detector in drip tray of the geyser.
5. An alarm will sound to indicate that there is water in the drip tray of the geyser.

Replace lid on control box and fasten properly.

Before you replace the lid it is important to do a final check on the electrics by comparing it to the wiring as indicated on the lid.

Power up system

1. Switch on main supply at DB board.
2. Then switch on power at isolator switch.

Summary



THERMOSIPHON SOLAR SYSTEM

Installation procedure steps

A summary of the installation steps are as follows:

1. Apply all safety measures.
2. Install the control box.
3. Install the display unit.
4. Remove existing thermostat and replace with new supplied thermostat.
5. Complete all electrical connections.
6. Set up the controller and all settings.

Step 1: Apply all safety measures

An installer should always take precautions when working with electricity.

The most important safety precautions to perform BEFORE doing any maintenance on a geyser are:

1

Switch off circuit breaker of geyser at main DB. This is done to ensure that there is no power supply to the geyser.



2

Switch off isolator switch in the roof. The isolator switch acts as a switch to isolate both live and neutral from the main supply should someone accidentally switch on the main supply or the circuit breaker fails.



3

Test with a MULTIMETER to ensure that there is no current on the wires. **IMPORTANT!** Make sure that there is no reading on the multimeter



STEP 2: Install control box

Find a dry place near the isolator switch. **The control box must not be exposed to the elements!**

STEP 3: Install the display unit

The display unit must be installed in a location that is accessible to the end user, but not in reach of children that might want to play with it.

The display unit provides valuable information on the functionality and status of your solar system.

Draw the display unit cable from the unit to the control box. Plug it into the three pin plug as provided on the control box. It can only fit into one plug.

The standard display cable of 5m is supplied. Extension cables are available on request from our offices. A maximum extension of 20m is recommended.

Only use GeysersWise extension cables for extensions!!!



STEP 4: Remove thermostat and replace with supplied geysers temperature probe

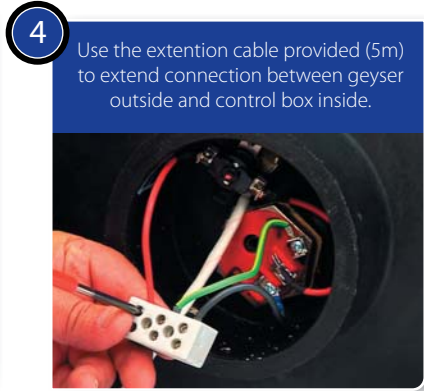
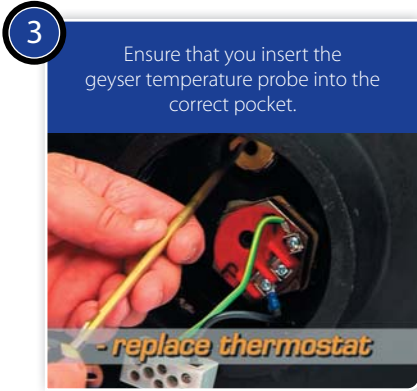
The geysers thermostat needs to be removed. The geysers temperature probe provided by GeysersWise has a built in probe that measures the temperature in the geysers. It also supplies information to the element whether it should switch on or not.

The GeysersWise geysers temperature probe incorporates a thermal cut out to prevent electrical overheating. The element will automatically switch off at electrical temperatures of 90°C. **Please note this temperature when designing a solar system.** When the cut out switches off, it needs to be reset manually by pressing the red button on the thermal cut out.

1 Remove the existing thermostat by disconnecting all the wires on the connector terminal block of the thermostat.

2 Pull the thermostat out of the pocket.

Please note that certain types of geysers require the user to remove the front part of the geysers temperature probe as provided.



Please note this temperature when designing a solar system.

When the cut out switches off, it needs to be reset manually by pressing the red button on the thermal cut out.

Connections on control box summary



STEP 5: Complete all electrical connections

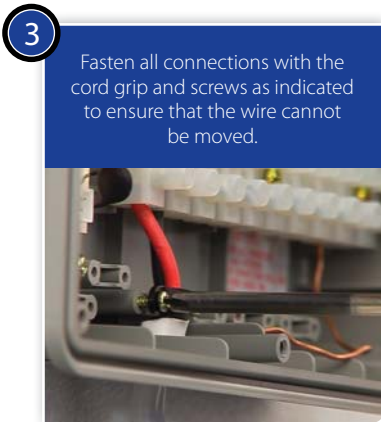
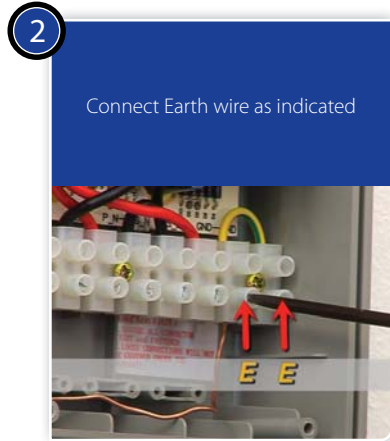
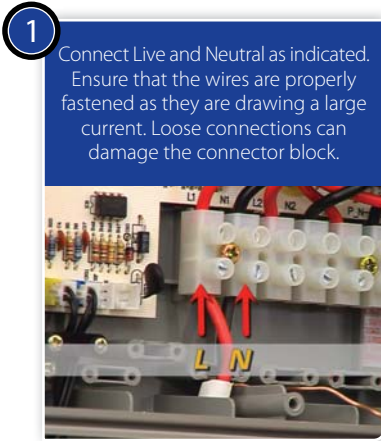
The hard wiring of a controller is critical.

Main power supply

The main power supply is provided from the isolator switch.

- The **Red** wire is your **Live** wire.
- The **Black** wire is your **Neutral**.
- The other wire provided is your **Earth**.

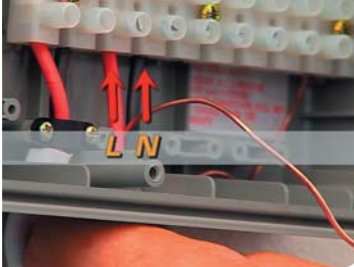
Each control box has knock outs at the bottom of the unit. To make an entry into the control box, just remove the knock out.



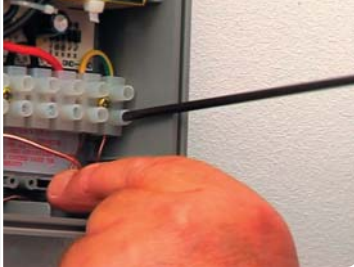
Connect wire between controller and geyser

Note: Ensure that a wire is used that complies with the requirements of SANS 10142.

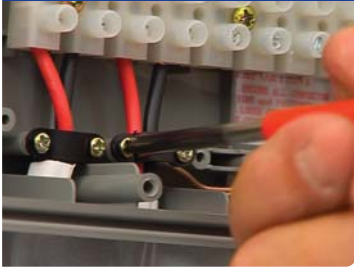
1 Connect Live and Neutral as indicated. Ensure that the wires are properly fastened as they are drawing a large current. Loose connections can damage the connector block.



2 Connect Earth wire as indicated.

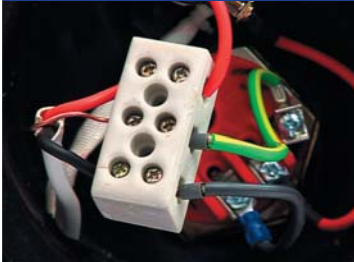


3 Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.



4 Connect wires to geyser's connector block.

5 Connect Live, Neutral and Earth as indicated.



6 Replace cover of geyser to protect the electrics.



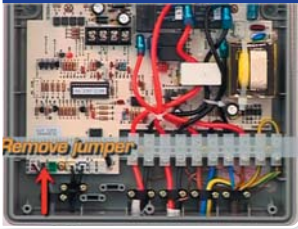
Connect leak detector (optional)

1. Push wire through the hole as provided.
2. Plug into green socket as provided on control box.



3. Plug leak detector onto lead wire.
4. Place detector in drip tray of the geyser.
5. An alarm will sound to indicate that there is water in the drip tray of the geyser.

Remove the jumper as indicated.



This is a very important step when the GeyserWise is fitted to a thermosiphon solar system.

Replace lid on control box and fasten properly.

Before you replace the lid it is important to do a final check on the electrics by comparing it to the wiring as indicated on the lid.

Power up system

1. Switch on main supply at DB board.
2. Then switch on power at isolator switch.

Summary



NORMAL ELECTRIC GEYSER APPLICATION

Installation procedure steps

A summary of the installation steps are as follows:

1. Apply all safety measures.
2. Install the control box.
3. Install the display unit.
4. Remove existing thermostat and replace with new supplied thermostat.
5. Complete all electrical connections.
6. Set up the controller and all settings.

Step 1: Apply all safety measures

An installer should always take precautions when working with electricity.

The most important safety precautions to perform BEFORE doing any maintenance on a geyser are:

1

Switch off circuit breaker of geyser at main DB. This is done to ensure that there is no power supply to the geyser.



2

Switch off isolator switch in the roof. The isolator switch acts as a switch to isolate both live and neutral from the main supply should someone accidentally switch on the main supply or the circuit breaker fails.



3

Test with a MULTIMETER to ensure that there is no current on the wires. **IMPORTANT!** Make sure that there is no reading on the multimeter



STEP 2: Install control box

Find a dry place near the isolator switch. **The control box must not be exposed to the elements!**

STEP 3: Install the display unit

The display unit must be installed in a location that is accessible to the end user, but not in reach of children that might want to play with it.

The display unit provides valuable information on the functionality and status of your solar system.

Draw the display unit cable from the unit to the control box. Plug it into the three pin plug as provided on the control box. It can only fit into one plug.

The standard display cable of 5m is supplied. Extension cables are available on request from our offices. A maximum extension of 20m is recommended.

Only use GeyserWise extension cables for extensions!!!



STEP 4: Remove thermostat and replace with supplied geyser temperature probe

The geyser's thermostat needs to be removed. The geyser temperature probe provided by GeyserWise has a built in probe that measures the temperature in the geyser. It also supplies information to the element whether it should switch on or not.

The GeyserWise geyser temperature probe incorporates a thermal cut out to prevent electrical overheating. The element will automatically switch off at electrical temperatures of 90°C. **Please note this temperature when designing a solar system.** When the cut out switches off, it needs to be reset manually by pressing the red button on the thermal cut out.

1


Remove the existing thermostat by disconnecting all the wires on the connector terminal block of the thermostat.

2

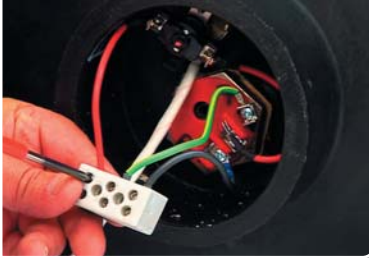
Pull the thermostat out of the pocket.

Please note that certain types of geysers require the user to remove the front part of the geyser temperature probe as provided.

3 Ensure that you insert the geyser temperature probe into the correct pocket.



4 Insert the new geyser temperature probe and connect the live wires once again on the connector terminal block



5 Push the plug connected to the thermostat through the hole as provided on the geyser.
Plug it into the dedicated plug as provided on the control unit.



Connections on control box summary



STEP 6: Complete all electrical connections

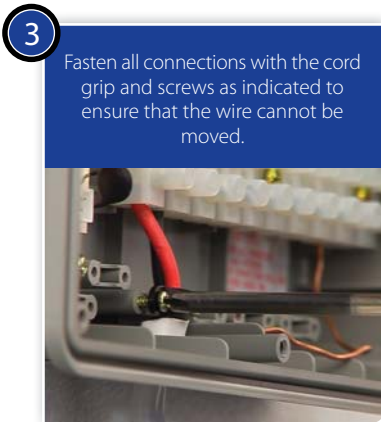
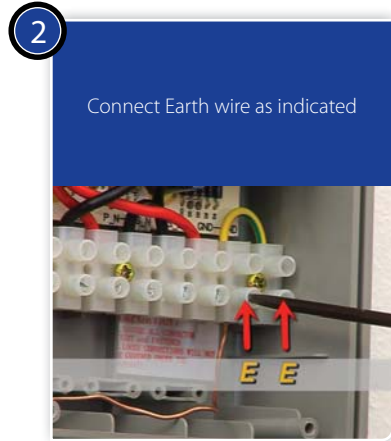
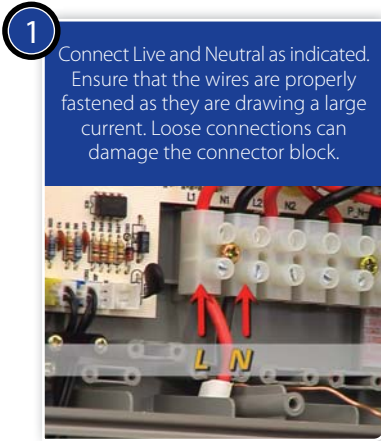
The hard wiring of a controller is critical.

Main power supply

The main power supply is provided from the isolator switch.

- The **Red** wire is your **Live** wire.
- The **Black** wire is your **Neutral**.
- The other wire provided is your **Earth**.

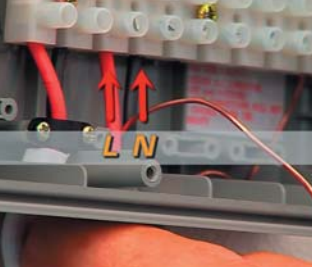
Each control box has knock outs at the bottom of the unit. To make an entry into the control box, just remove the knock out.



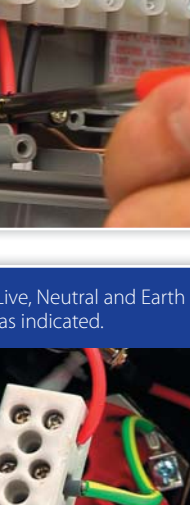
Connect wire between controller and geyser

Note: *Ensure that a wire is used that complies with the requirements of SANS 10142.*

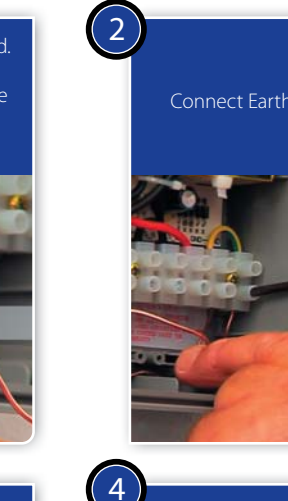
1 Connect Live and Neutral as indicated. Ensure that the wires are properly fastened as they are drawing a large current. Loose connections can damage the connector block.




2 Connect Earth wire as indicated.




3 Fasten all connections with the cord grip and screws as indicated to ensure that the wire cannot be moved.



4 Connect wires to geyser's connector block.



5 Connect Live, Neutral and Earth as indicated.



6 Replace cover of geyser to protect the electrics.



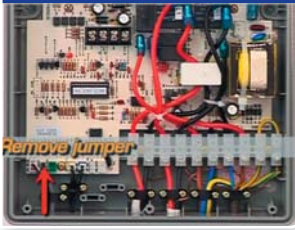
Connect leak detector (optional)

1. Push wire through the hole as provided.
2. Plug into green socket as provided on control box.



3. Plug leak detector onto lead wire.
4. Place detector in drip tray of the geyser.
5. An alarm will sound to indicate that there is water in the drip tray of the geyser.

Remove the jumper as indicated.



This is a very important step when the Geyserwise is fitted to a thermosiphon solar system.

Replace lid on control box and fasten properly.

Before you replace the lid it is important to do a final check on the electrics by comparing it to the wiring as indicated on the lid.

Power up system

1. Switch on main supply at DB board.
2. Then switch on power at isolator switch.

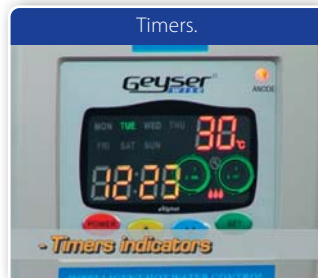
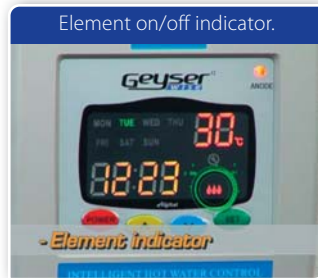
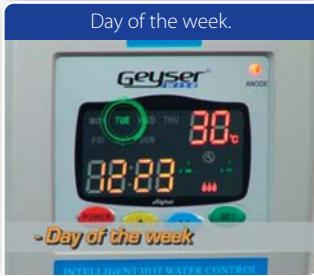
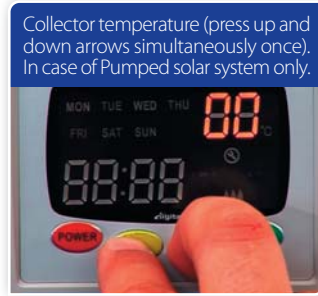
Summary

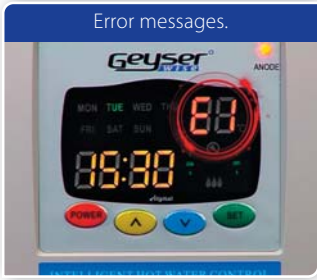


STEP 7: Display

The display is the feedback mechanism to the user and displays important information about the solar system or electric geyser.

It displays the following:





Adjusting the day of the week

To adjust the day of the week, follow the steps below:



Adjusting the real time clock

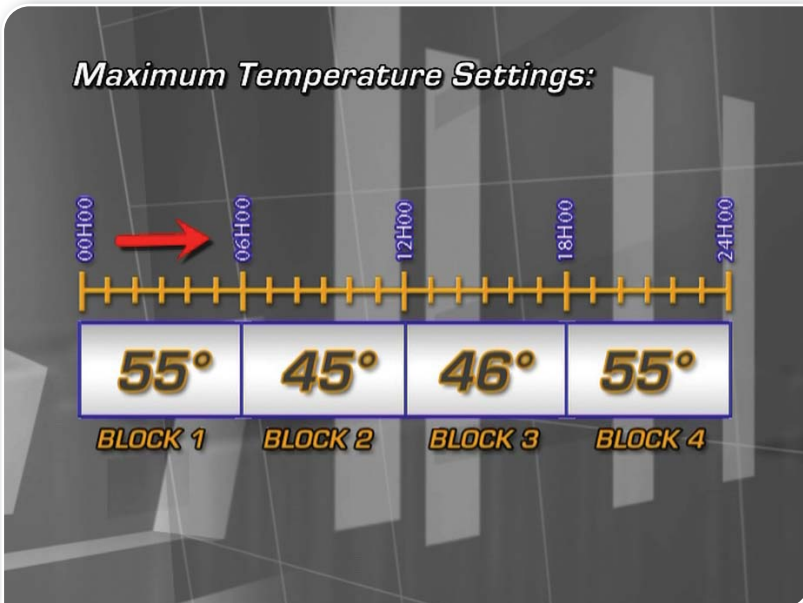
To adjust the real time clock follow the steps below:

- 1** Press the green set button until the time flashes.


- 2** And set the hours to your requirement. Press the green set button immediately after setting the hours to get to the minute counter. Set the minutes according to your requirements by using the **▲** and **▼** arrow keys.

Maximum temperature settings

There are four maximum temperature settings. It is important to note that these settings apply to the four quarters of the day and not to the set times that the elements must come on.



1 To adjust the maximum temperature settings, press the green set button until the first block temperature setting is displayed. The temperature will be flashing and the number of the block will be displayed in the timer indicator block. The below screens show the temperature flashing in block number 1.

2 Set the temperature per block to user requirements by using **▲** and **▼** arrow keys.

Setting solar differential (default 7°C) (only for 220V and 12V pumped systems)

Definition of solar differential

Once the panel temperature is 7°C (or your set temperature) higher than the tank temperature the pump will switch on.

To adjust the solar differential follow the steps below:

1 Press the green set button until the temperature pump light and green timer on light flashes.

2 Set the temperature differential to your requirements using the **▼** and **▲** arrow keys. Available temperatures is 7°C to 15°C.

Setting the anti-freeze temperature

GeyserWise has an antifreeze function where the pump will start circulating warm water from the pump to the collector if the panel reaches a set temperature (default 5°C).

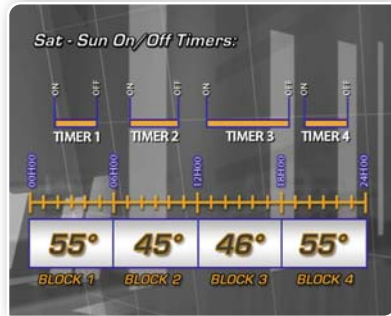
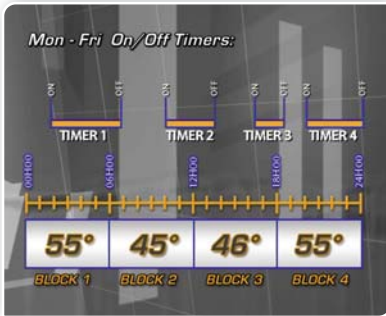
Set your own anti-freeze temperature (between 0 and 10°C) by following the steps below:

1 Press the green set button until the temperature and pump light flashes.

2 Set the antifreeze temperature to your requirements (between 0 and 10°C) using the **▼** and **▲** buttons.

Setting geyser element timers

There are four on/off timers that can be set with the GeyserWise. Note that you can set different timers for the weekend.



To set timer number one, follow the steps as indicated below:

1 Press the green set button until the timer indicators and Monday to Friday flashes. The below picture shows that you are at the Monday to Friday setting for timer number 1 on.



4 Adjust the hours you require by using the **▲** and **▼** buttons. Immediately press the green set button again to get to the minutes and use the **▲** and **▼** buttons to adjust the minutes.

Follow the same steps as above for timer 2, 3 and 4.

2 Adjust the hours you require by using the **▲** and **▼** buttons. Immediately press the green set button again to get to the minutes and use the **▲** and **▼** buttons to adjust the minutes.

3 To set the number 1 off timer, press the green set button until the timer indicators and Monday to Friday flashes. The below picture shows that you are at the Monday to Friday setting for timer number 1 off.



To get to the weekend timer setting press the green set button until the timer indicators and Saturday and Sunday flashes.



Eliminating a timer

It is possible to eliminate a timer setting. To eliminate a setting follow the following steps:

- Press the down arrow button until the timer setting reaches 00:00.
- Press the down arrow once more to eliminate until --:-- is displayed.

Follow the steps on page 41 with on and off setting.

Holiday mode setting

For pumped solar systems only

It does happen that a homeowner leaves his premises for a period of time. If the homeowner does not use any hot water, it may lead to overheating of the geyser.

To prevent occurrence of the above mentioned the GeyserWise has a holiday mode function.

When the holiday mode function is activated the system performs the following functions:

- It switches the element off (ignores timer settings).
- It starts the pump at 18h00 every night and cool the geyser temperature down to 50°C or to 06h00 the next morning, whichever comes first.

To activate the holiday mode, press the power and set buttons simultaneously. To deactivate the holiday mode, press the power and set buttons again.

Only the word **OFF** will be on the display.



Manually overriding element timers

You can manually override the geyser element timers by simply pushing the power button once.

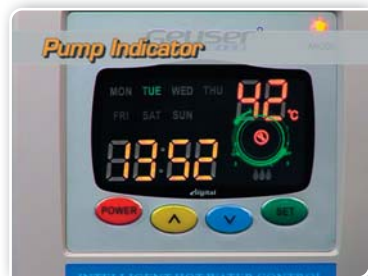
Pump indicator

For pumped solar systems only

The pump indicator indicates that the pump is running. The pump switches on when the collector temperature is 7°C higher than the geyser and switches off if the collector is 4°C higher than the geyser.

Hint

If the pump indicator is on, but the geyser temperature does not rise and the collector temperature rises, it means that the water is not pumping through the system. This may be caused by a faulty pump or faulty non return valve.



Element indicator

The element indicator shows the user when the element is switched on.

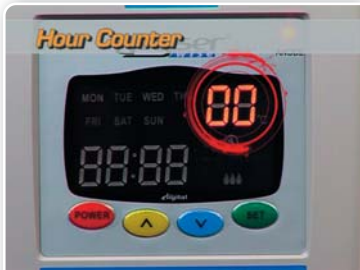
When the element indicator is on, it means that the element is switched on.

When the element indicator is flashing, it means the water has reached the maximum temperature setting and the water will be allowed to cool down 6°C at which time the element switches back again.



Hour counter

The number of hours that the element was on can be counted. If the user pushes the up and down arrows simultaneously and keep them in for 6 seconds, the number of hours will be displayed.



For example: Let's say the hour indicator indicates 30 hours. You then multiply the number of hours with your geyser element rating, e.g. 4 kW. This then means that the user consumed 120 kWh since the last time the unit was reset.



To reset the hour counter, keep the up and down arrow buttons in simultaneously until the main time settings reappear.

Error codes - Summary



The error codes indicate various problems and warnings. Therefore these require actions from the installer.

Error code: E1 - Earth leakage

Possible cause:

Faulty element or earth leakage (more sensitive than normal household earth leakage).

Action(s):

Element needs to be replaced - contact our office or qualified person to replace the element.
(More information on page 45)

Error code: E2 - Dry burn protection

Possible cause:

Empty cylinder
Thermal pocket too close to element

Action(s):

Check all water connections to the geyser
(More information on page 45)

Error code: E3 - Sensor failure water geyser

Possible cause:

The sensor could be damaged or there is a connection problem

Action(s):

Replace sensor
Check electrical connections and/or plug in control unit
(More information on page 45)

Error code: E4 - Heating loss

Possible causes:

- Leaking hot water pipe
- Faulty valve
- Scale build up
- No power supply to the element
- Reversed thermosiphoning
- Faulty heating element

Action(s):

Check all of the above
(More information on page 46)

Error code: E5 - Over temperature protection

Possible cause:

Geyser temperature exceeds 85°C

Action(s):

Open hot water tap to reduce temperature in geyser
(More information on page 47)

Error code: E6 - Water leak

Possible causes:

- Leaking geyser
- Valves leaking
- Overflow leaking

Action(s):

Check all connections
(More information on page 47)

Error code: E7 - Communications failure

Possible cause:

Poor contact or damaged cable

Action(s):

Check communications wire between control box and display unit
(More information on page 47)

Error code: E8 - Probe failure collector

Possible causes:

- Faulty sensor
- Geyser temperature over 80°C
- Collector temperature over 120°C

Action(s):

- Check that water is circulating through system
 - Check sensors
- (More information on page 48)

Error code: E9 - Pump failure

Possible causes:

- Faulty pump
- Blockages in pump
- Electrical error on pump

Action(s):

- Replace pump
 - Check all electrical connections
 - Clean pump
- (More information on page 48)

E1 Error code: Earth leakage

Please note that the geyser element will not work during an E1 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible cause

Earth leakage fault on the element.

Remedial action

- It's recommended that you contact an electrician or GeyserWise technician to deal with the E1 error code.
- The following steps should be taken by the electrician or technician. PLEASE DO NOT DO THIS YOURSELF.
 1. Switch off mains power to geyser (DB board and isolator switch).
 2. Remove the live and neutral wire from the element.
 3. Use a multimeter to measure resistance between element and earth. There should be no reading (open circuit). If there is a reading, the element is down to earth and needs to be replaced.

E2 Error code: Dry burn protection

Please note that the geyser element will not work during an E2 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible cause

Empty cylinder due to:

- Geyser is empty due to work on main water supply.
- The thermal pocket too close to the element.

Remedial action

- Make sure there is water in the geyser by opening a hot water tap.
- If the geyser does have water in it, get a technician to check the thermal pocket is pulled away from the element (DO NOT DO THIS YOURSELF).
- Note that a red copper element could suffer damages in case the tank is empty.

E3 Error code: Sensor failure water geyser

Please note that the geyser element will not work during an E3 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible cause

The sensor to the geyser is damaged or not connected properly.

Remedial action

Get a technician to check the connector, wiring and geyser probe to ensure all wires are intact and connections made properly as per this instruction manual.

E4 Error code: Heating loss*Possible cause*

An E4 error code occurs when the element is switched on and heats at a tempo of less than 4° in an hour - considerably less than what would be expected. This means that the element is not working to capacity or a heat loss is occurring somewhere. This could lead to using a lot more electricity than would be expected. The heat loss could occur for various reasons:

- No power supply to element.
- Element failure.
- Leaking hot water pipe.
- Pipe work not installed correctly.

The E4 error code is based on the specific heat equation. How long should it take a body of water to be heated from one temperature to another higher temperature? For example:

If a 150 litre geyser filled with cold water (20°C, say) is switched on, how long will it take a 3kW element to heat the water to 65°C? The basic equation is:

$$Q = mc(T_2 - T_1) / 3600$$

where: **Q = energy in KWh needed to raise water temperature from T1 to T2**

m = mass of water (Kg); = 150 in this case

c = specific heat of water (4.19 KJ/Kg/ C)

Therefore Q can be calculated as 7.85kWh, and a 3kW element will take $7.85/3 = 2.6$ h to bring the geyser's water up to 65°C.

In the above equation it takes a 3kW element 2.6 hours to heat 150 litre of water by 45 degrees. On average 17.4°C per hour.

Based on this equation we went to look at the requirements in the ESKOM rebate programme regarding sizes of elements and tanks, values given below.

Recommended element ratings are as follows that are used in the programme may not exceed a power rating of:

- 1kW for a system between 50 litres and 99 litres.
- 2kW's for a system between 100 litres and 250 litres.
- 3kW's for a system between 251 litres and 350 litres.

Based on the equation,

- A 1kw element on 99 litres should heat at a tempo of 9° per hour.
- A 2kw element on a 250 litre tank should heat at a tempo of 7° per hour.
- A 3kw element on a 350 litre tank should heat at a tempo of 7° per hour.

Remedial action

- Switch off mains to geyser at DB board for 3 seconds.
- Switch the geyser back on at the DB board.
- Press the red power button on the GeyserWise to switch on element.
- You should see at least 1°C temperature rise in 20 minutes without any water withdrawals.
- If you still get an E4 error code please contact our offices for further advice.

E5 Error code: Over temperature protection

Please note that the geyser element will not work during an E5 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible cause

Geyser temperature exceeds 85°C

Action(s)

Open hot water tap to reduce temperature in geyser

E6 Error code: Water leak

Please note that the geyser element will not work during an E6 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible causes

- Leaking geyser
- Valves leaking
- Overflow leaking

Action(s)

Check all connections

Remedial action

Check if there is any water in the drip tray under the geyser. If there is any water, dry the drip tray and water leak detector. The source of the water should be investigated.

E7 Error code: Communication failure

Please note that the geyser element will not work during an E7 error code. First try to reset the unit by switching the geyser off at the DB board and then switching it back on after 3 seconds. If the error persists, follow the steps below.

Possible cause

Poor contact or damaged cable

Action(s)

Check communications wire between control box and display unit

E8 How to deal with error indication - below information relevant for pumped solar systems only

When the tank reaches a maximum temperature of 80°C, the pump will be switched off to stop more hot water circulating to the geyser. This is totally normal operation and can be reduced as per the instructions.

Firstly, with the increased amount of solar radiation, we want to ensure that you get the greatest possible savings out of your system, reducing the electrical backup to zero or as close as possible to zero with all or most of your water heating coming from solar.

The second matter is to minimize overheating of the solar collector on your roof. One of the safety features of GeyserWise, is to have the solar circulation shut down when the water in your geyser reaches 80°C. This is to prevent dangerously high temperature levels in the geyser which could blow other safety valves. When the circulation shuts down on a hot day, because water is no longer circulating in the solar collector, the temperature in the collector very quickly rises. This can result in steam generating in the collector and also loud bubbling when a hot tap is opened allowing steam to bubble into the geyser. While systems are designed for this, excessive heating may have an influence on the lifespan of the system.

Ways in which you can improve this situation:

1. Reducing the electrical backup temperature to ensure the temperature is as low as possible early in the morning (preferably below 30°C). Reduce the temperature to the minimum setting of 30°C from about October until the end of March. This effectively means that the element does not switch on at all for six months of the year and all water heating is from solar. On the GeyserWise controller, use the following procedure to ensure the element seldom or never switches on:
 - Press the SET button once and a temperature setting will appear.
 - Use the V button to reduce this setting to the minimum of 30°C. Should you find that you do not have sufficient hot water you may need to vary this setting, using as low a temperature as possible to ensure you have enough hot water but using as little electricity as possible.
 - Press the SET button again and another temperature setting will appear, repeat the above procedure.
 - Repeat this procedure twice more. There are four temperature settings on the GeyserWise which are for different periods of the day.
2. For immediate alleviation consider letting some hot water out of the geyser by turning the hot water tap on. Consider water wastage in this instance.
3. Should an E8 error occur on a frequent basis during summer (daily), also consider covering part of the solar panel with shade cloth or remove heat pipes in the case of evacuated tube systems.

For safety purposes, please also ensure installation of tempering valves to ensure water leaves the tap at a maximum of 55°C to 60°C

E9 Error code: Pump failure*Possible cause*

An E9 error code occurs when the pump is powered on but the temperature in the collector does not decrease. This could be due to a pump failure or blockage in the system.

Temperatures of solar system expected to reach temperatures above 90°C



It has come to our attention that some thermosiphone solar systems regularly exceed our 90°C thermal cut-out temperature in which case the thermostat has to be reset.

The thermostat has to be reset manually by turning off the power, opening the cover, pressing the little red button, closing the cover and turning the power on again.

We do not recommend temperatures as high as 90°C, but would like to offer a workable solution in case of higher temperatures.

At the moment all our MAX models come with the following thermostat:

Thermal cut-out sold with GeyserWise MAX model

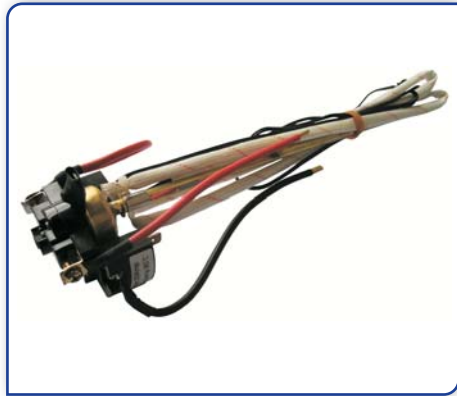
Cut-out temperature is at 90°C.

***NB: Please note cut-out temperature.**

Mechanical and electronic thermal cut-out. Mechanical thermal cut-out at 90°C and electronic open circuit at 120°C.

This cut-out should be suitable for all solar designed not to reach temperatures exceeding 90°C and is supplied as standard with all our units.

In cases where you do expect temperatures above 90°C (mostly in case of thermosiphone systems), please request from our sales staff another combination to use as below:



Soft probe with adapter

The soft probe is supplied with all Satchwell and Franke units being distributed by Satchwell and Franke. The electronic cut-out temperature is 120°C.

***NB: Please note cut-out temperature.**

No mechanical cut-out; electronic only.



How to deal with a power failure in the case of 220V pump application

If a 220V pump is used in a pumped solar system there will be no back-up power to drive the pump in case of a power failure. The display of the GeyserWise will also not be working during the time the electricity is off.

What are the risks if the pump is not working?

During the evening or when it is cold and the sun is not shining, there is no risks to the system and no action is necessary

If the electricity is off for an extended period (longer than 1 hour) during the day and the sun is shining the collector could overheat. This should not be a problem if the necessary safety valves are installed on the system. It is recommended that you cover the evacuated tubes if you know the electricity will be off for an extended period of time during the day.

What will happen when the power comes back on?

- If the power was off during the night, the system will operate as usual.
- During the day, the GeyserWise will switch on and the pump will be switched on and an E8 warning code will be displayed. The E8 warning code means that the collector is over 99°C.
- If the temperature in the collector is between 99°C and 129°C, GeyserWise will flash 99 and E8 alternatively. When the temperature in the collector rises above 129°C, the GeyserWise will flash - - and E8 alternatively.
- The pump will continue circulating until the collector has cooled down.

If there is no power during the night and temperatures drop below freezing, there will be no freeze protection function. This is a serious situation, as it can result in failure of flat plate solar collectors. We would recommend that in frost-prone areas pumped flat plate systems using 220 volt pumps either use a freeze protection (dump) valve or an indirect configuration for further protection.

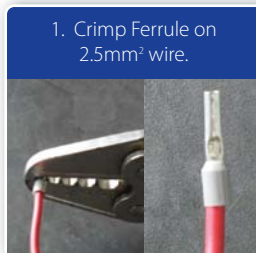
How to prevent loose connections on the terminal blocks

From time to time our installers experience burnt terminals blocks due to connections not tightened properly when the unit is installed.

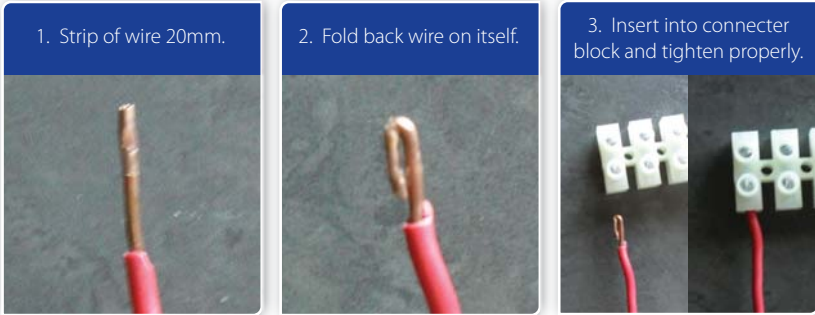
The terminal blocks used in GeyserWise are rated at 41 Amp 750 volt with temperatures rating of 140°C.

It is very important that the connections are tightened properly when the unit is wired up and the below steps illustrate how to prevent any loose connections. There are two methods that can be used - the Boot Lace Ferrule Method and the Fold Back Method.

Use of Boot Lace Ferrule Method



Use of Fold Back Method



Please note: Regulations require that a minimum of 2.5mm² wire is used.

ALWAYS TIGHTEN ALL CONNECTIONS ON THE TERMINAL BLOCK PROPERLY.

Leaking hot water pipe - check the water meter if no taps are open.

Reverse thermosiphon in case of a pumped solar system - at night if the element is on and the collector temperature rises, you have reverse thermosiphon on the solar system.

Scale build-up on the element can also cause water to heat up slower than expected.

To reset the E4, switch off geyser at the main distribution board for three seconds and switch on again. The E4 will now be reset. Press the power button to switch on the element. If you gain no temperature in the geyser for 15 minutes, investigate the possible causes as above and contact our offices for further assistance.

GeyserWise antifreeze function (pumped solar only)

Please note that it is important that the correct solar system for frost prone areas is used. ESKOM recommend an indirect solar system. Please consult ESKOM website on how to choose a solar system: <http://www.eskomidm.co.za/residential/residential-technologies/step-by-step-guide-to-choosing-a-solar-water-heating-system>

GeyserWise has an antifreeze function where the pump will start circulating warm water from the geyser to the collector once the collector temperature reaches 5°C (default) to prevent the panel from freezing.

Please note the appropriate panels for frost prone areas and anti-freeze valves are still needed. ESKOM also recommend an indirect system for frost-prone areas.



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