



ENERGYSENSE

EECO Product Range



GEYSER CONTROL UNIT



SOLAR GEYSER CONTROL UNIT

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*Features marked with an * is applicable only to the SGCU*

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INSTALLER GUIDE OUTLINE

Preface

Thanks for choosing the Energy Sense Energy Efficient Control (EECO) product range (hereafter referred to as “GCU or SGCU”), this manual is to give information on how to install and use the EECO GCU and SGCU properly.

Installers must read and understand this manual prior to installation. For further information, please contact customer support at info@energysense.co.za. Installers should follow all safety precautions described in this manual as well as local codes when installing a control unit.

Keep this manual in a safe place for future reference (care and maintenance) and in case of sale or disposal of the EECO GCU or SGCU.

Applicable Products

This manual applies to the series of EECO products as listed below:

EECO GCU	Geyser Control Unit
EECO SGCU	Solar Geyser Control Unit

Symbols



This symbol indicates information that if ignored, could result in physical damage or personal or even death due to incorrect handling.

This manual contains all instructions and information regarding the installation, setup, operation and troubleshooting of the GCU/SGCU. Do not discard after installation.

SAFETY INSTRUCTIONS



- The GCU and SGCU are built to comply with SANS 181 standards, ensuring they meet the required specifications for use with water heater systems. Additionally, both units are qualified for safety under SANS 60730, feature an IP65-rated enclosure, and comply with GR 17011, making them suitable for this application class and meeting safety requirements. The products have also passed communication testing in accordance with ICASA standards, complying with ETSI EN 300 328 and ETSI EN 489-1, 3 for wireless communication.
- **BEFORE STARTING** the installation process, please ensure you follow all applicable safety guidelines and standards.
- **STRICTLY** follow the installation instructions to ensure a successful and safe installation.
- Installing GCU and SGCU requires **SPECIALISED SKILLS** and knowledge. Installation can only be performed by a qualified licensed electrical contractor. This is not a DIY product.
- **DO NOT** attempt to disassemble the unit in the case of malfunction. Consult the installation guide for troubleshooting or contact customer support.

This manual contains all instructions and information regarding the installation, setup, operation and troubleshooting of the GCU/SGCU. Do not discard after installation.

- **DO NOT** touch conductive parts such as terminals which can result in burns, sparks and lethal shock whether or not the control unit is connected.



- Always **CHECK THAT THE POWER IS OFF** when attempting to work on wires or around open terminals with metal tools. Installers should assume all risks of injury that might occur during installation, including, but not limited to, the risk of electric shock.
- **DO NOT** disconnect the control unit under load.
- The enclosure **FIRE RATING** is only valid if the instructions in this manual are followed.
- The unit should be connected to a grounding system that complies with local codes and laws.

UNPACKING OF THE PRODUCT

Each control unit consists of the following parts:

1. (S)GCU
 - a. Control Unit (base, lid and four plastic screws, Pigtail for connecting the control unit and thermostat by wiring),
 - b. Digital thermostat,

This manual contains all instructions and information regarding the installation, setup, operation and troubleshooting of the GCU/SGCU. Do not discard after installation.

- c. Installation manual,
- d. Five-meter digital thermistor cable (SGCU only),
- e. Pigtail for connecting the control unit and thermostat by wiring (SGCU a second pigtail will be provided),
- f. Link to the installation manual online.

Other parts such as digital thermistor extension cable, pigtails and test digital thermistors can be bought separately by visiting our website.

The following tools and spares will be required for the installation.

Tools: Multimeter, Phillips screwdriver, pliers/side cutters, drill and drill bits.

Spares: $\pm$ 1-2m round surfix or single (Red, Black, Green/Yellow) 2.5mm² general purpose electrical wire, Copper ring lug (6 x 2.5mm²), 1-2m PVC Sprague-20 mm, saddles to secure the sprague, and wood screws.

This manual contains all instructions and information regarding the installation, setup, operation and troubleshooting of the GCU/SGCU. Do not discard after installation.

LIABILITY

Except as expressly and specifically provided in this Manual:

To the extent permitted by law, Energy Sense shall not be liable for any direct, indirect, incidental, special, or consequential damages arising from the use or inability to use this product. This includes, but is not limited to, damages for loss of profits, business interruption, or personal injury. In no event shall Energy Sense's total liability exceed the purchase price of the product.

This product is provided 'as is,' and Energy Sense disclaims all express or implied warranties, including but not limited to warranties of merchantability or fitness for a particular purpose. Improper installation, failure to follow the installation manual, or unauthorized modifications to the product void all liability. Energy Sense is not liable for delays or failure due to causes beyond its control. If any part of this limitation is held to be unenforceable, the remaining provisions shall remain effective.

INTRODUCTION

Introducing the **Geyser Control Unit (GCU)** and **Solar Geyser Control Unit (SGCU)**—your smart solutions for efficient water heating management. These devices offer 24/7 monitoring and remote control of your geyser, enabling you to:

- **Control Remotely:** Manage your geyser from anywhere via our intuitive mobile app (iOS & Android) or web platform.
- **Set Schedules:** Customize multiple schedules to optimize geyser operation, reducing electricity consumption.
- **Monitor Energy Usage:** Track real-time energy consumption to enhance efficiency.
- **Ensure Safety:** Benefit from comprehensive safety features, including irregular power usage alerts and no-water detection.

The **SGCU** is specifically designed to enhance the efficiency of most third-party solar water heaters equipped with a 12V DC pump. It circulates water heated by the solar collector, gradually increasing your geyser's temperature without relying on electricity.

Both units empower you to actively and passively manage your water heating systems through our user-friendly mobile app, providing smart control, energy savings, and sustainable water heating solutions tailored for your home.

*Note: **Features exclusive to the SGCU are indicated with an asterisk (*)**.*

FEATURES

- Mobile App (Android & IOS)
- Built-in WiFi for mobile monitoring (2.4GHz Ch. 1- 11)
- Customizable schedules to optimise run time
- Day/Night temperature settings
- Learning algorithms to optimise 'ON' time and water temperature
- Geyser automation
- Measure and monitor electricity usage with real-time insights
- Reduce overall geyser electricity usage
- Safety features (Overload protection, irregular power usage, water supply cutoff)
- Measure and record geyser temperature
- 220VAC heating element control
- Measure and record collector temperature*
- Collector equilibrium control*
- 12V DC pump control*

BASIC SYSTEM OVERVIEW

The illustration below shows the basic setup of the GCU/SGCU within the larger system, see Figure 1. The control unit pinout is in Figure 2.

The following is needed for the system to properly function:

- Geyser
- Collector*
- 12V DC pump*

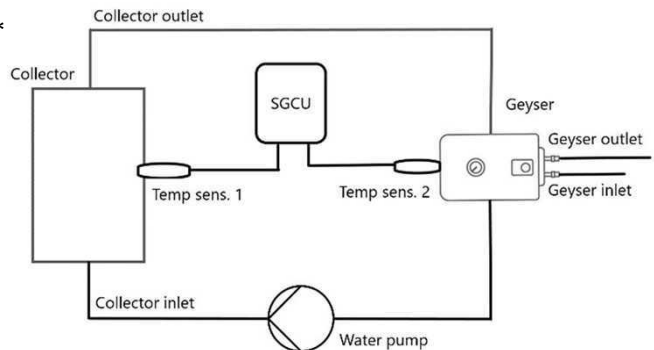


Figure 1

CONTROL UNIT PINOUT

1. Live in
2. Neutral in
3. N/A or -12V*
4. N/A or +12V*
5. Ground
6. Ground
7. Live out
8. Neutral out
9. Temp. probe 1 (geyser)
10. Temp. probe 2* (collector)



Figure 2

CONTROL UNIT SAFETY FEATURES

- Over temperature protection
- Short circuit and over-current protection
- Over-voltage protection (11.8 - 12.1V)*

COMPLIANCE AND CERTIFICATIONS

- Product - SANS 181
- Control Unit - SANS 60730 Class I
- Power Supply Unit (PSU) - PTC18011512002S-LD01
- Communication – ETSI EN 300 328, ETSI EN 489-1, 3
- Enclosure – IP65 rated & GR 17011
- WiFi - ETSI EN 300 328 & ETSI EN 301 489-1, 3

INSTALLATION

Before installation, ensure all the parts required for the installation of the product was included (Page 7 – Unpacking of the Product).

Mounting the unit

Consider the following before selecting placement:

- Do not mount the unit on a wet or damp surface.
- Mount on a solid surface such as a roof truss.
- For proper air circulation and heat dissipation, allow a clearance of 30cm from side to side and top to bottom between the unit and other objects. See Figure 3 for details.
- The ambient temperature should be between -5°C and 65°C to ensure optimal performance.
- The unit should be mounted in such a way that all wires are clear of walkways and the roof access point.
- It is recommended that the lid of the control unit faces in the direction of your WiFi router.
- It is recommended that you use channel 6 on your WiFi router for the control unit exclusively.
- Ensure the WiFi signal strength is consistently above 10% for optimal performance.

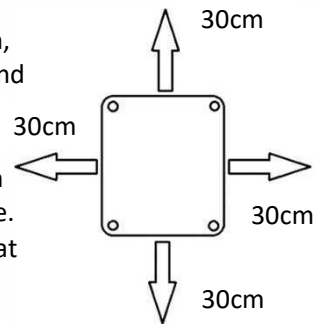


Figure 3

WIRING



Warning – this is a series connected system

1. **Switch off** the geyser breaker at the Distribution Board (DB) to cut power. Place a sign indicating work is in progress (Figure 4).
2. **Switch off** the geyser **isolator** near the geyser to ensure you stay safe in case of accidental power from the DB or wrongly marked or faulty breakers (Figure 5).
3. **Test the supply wires** with a multimeter to confirm no voltage is present before starting (Figure 6).

Figure 4



**Switch off the
geyser circuit
breaker**

Figure 5



**Switch off the
geyser isolator**

Figure 6



**Test the geyser
terminals for
voltage**

Wiring the GCU/SGCU

1. Remove the geyser heating unit cover plate (Figure 7).
2. Disconnect the wires from the thermostat connector block and remove the old thermostat (Figure 8).
3. Connect the Live (L), Neutral (N) and Ground (E) from the isolator switch to the GCU/SGCU (Figure 9).
4. Remove the GCU/SGCU cover. Connect Live (L) to the L-IN terminal (terminal 1), connect the Neutral (N) to the N-IN terminal on the unit (terminal 2), and connect Earth (E) to the EARTH terminal on the unit (terminal 5) (Figures 2 and 9).
5. Connect a new (min 2.5mm) red wire to the L-OUT terminal (terminal 7), black wire to the N-OUT terminal (terminal 8), and earth wire to the second EARTH terminal (terminal 6) (Figure 10).
6. The geyser temperature probe to be inserted into the geyser should be connected to the appropriate connector(Figure 11).

SGCU only

7. Connect -12V and +12V wires to terminals 3 and 4 for the 12V DC pump* (Figure 12)



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12*

Replacing the thermostat

1. Disconnect and remove the existing thermostat from the geyser (Figure 13).
2. Install the new digital thermostat in its place (Figure 14).
3. Connect the other end of the new wire installed in the previous section, “Wiring the GCU/SGCU” (Figure 10), to the L and N terminals on the replacement thermostat. Attach the earth wire to the geyser element's earth connection point (Figure 15).
4. Close the geyser lid cover after the installation (Figure 16).



Figure 13

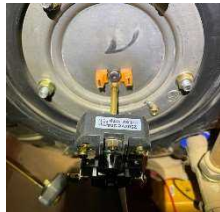


Figure 14



Figure 15



Figure 16

Connecting the 12V DC Pump*

1. Connect the +12V (Pos) wire to the DC pump red wire (+12V) (Figure 17).
2. Connect the -12V (Neg) wire to the DC pump black wire (-12V) (Figure 18).



Figure 17



Figure 18

Installing the Collector Probe*

1. Insert the temperature probe (Figure 19) into the small hole on the return side of the collector.
2. Place the probe inside the sleeve and secure it with cable ties (Figure 20).
3. Ensure the probe wire running back to the SGCU is not pinched or damaged by any objects.
4. Cover all exposed parts of the probe wire with the protective sleeve, especially where it enters the collector and roof.
5. Connect the probe to the SGCU at the designated terminal (Figure 21).



Figure 19



Figure 20



Figure 21

WIRING OVERVIEW

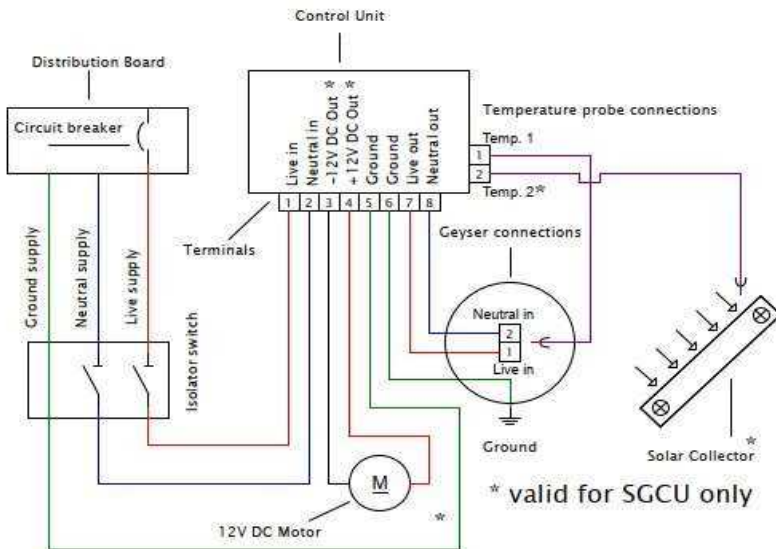


Figure 22

Figure 21 shows the final wiring diagram after completing all installation steps. For a GCU, the 12V DC pump and collector temperature probe are excluded.



Ensure all connections are secure with no bridging between terminals. Inspect the area for any loose wires or tools that could cause hazards. Confirm the wiring is correct, then switch on the isolator and breaker at the DB. Check that the Power LED is on. If it does not light up, refer to the troubleshooting section of this manual. Close the SGCU/GCU lid and securely fasten all four screws.

INSTALLING THE MOBILE APP

Once the hardware is installed, click on the link sent by your distributor or download the third-party Blynk IoT App and activate your account. Alternatively, scan the QR code to go directly to the download page.



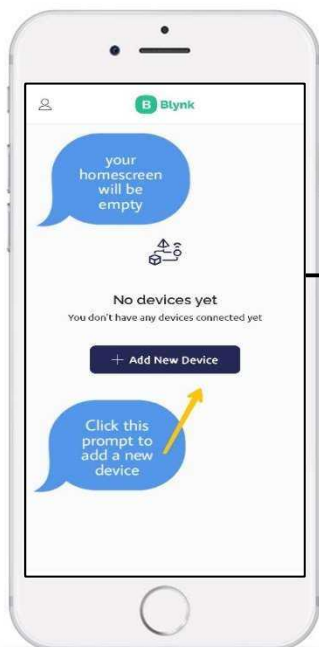
Android



IOS

Process to add a device to your home screen

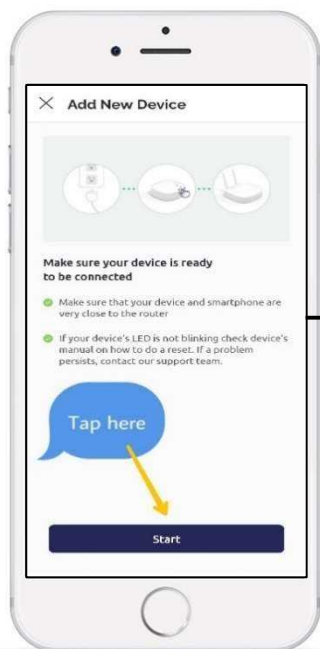
Step 1



Step 2



Step 3



Step 4



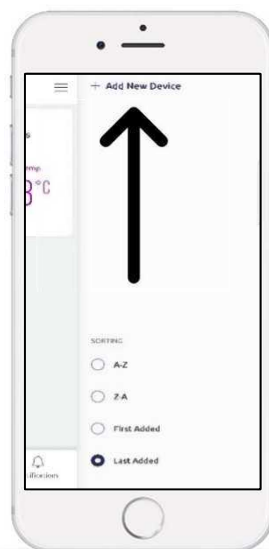
If the mobile device is not picking up the control unit, it will have to be added (instructions below). If the device was connected successfully, continue to Page 21 (Step 7).

Manually add a device

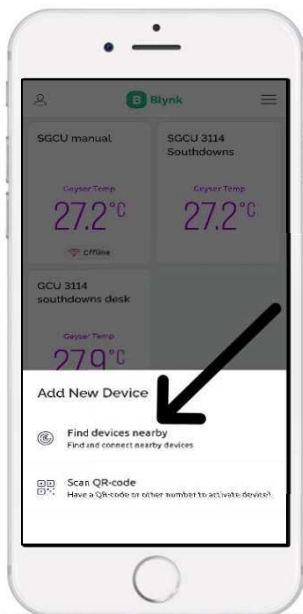
Exit to the app home screen and tap the menu (three horizontal lines at the top right corner).

Select 'Add New Device'.

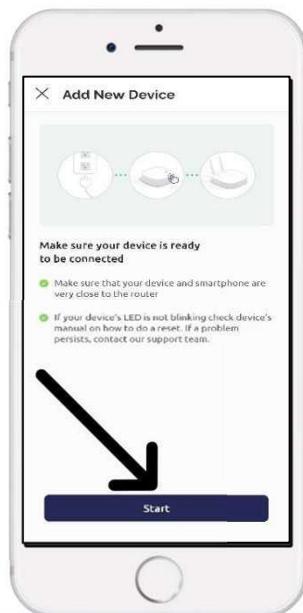
Step 1



Step 2



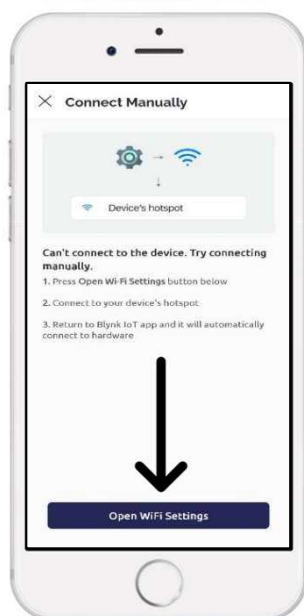
Step 3



Step 4

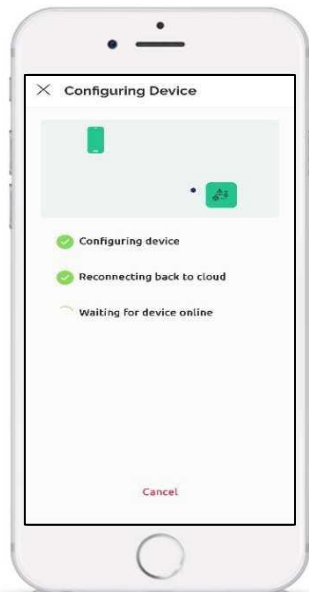


Step 5



After selecting 'Open WiFi Settings' all available networks will show. Connect with the device. Once connected, exit back to the app for configuration process to continue.

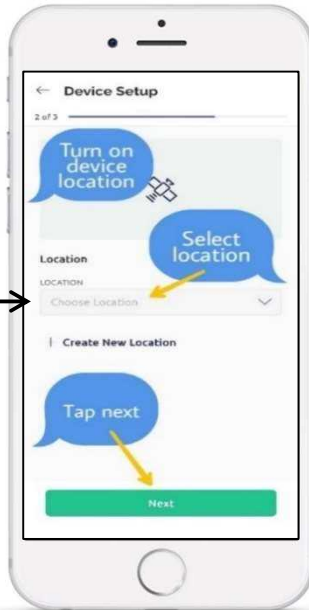
Wait for the device to complete its connection before proceeding with the below steps.

Step 6**Step 7****Step 8**

Step 9



Step 10



Step 11



Step 12



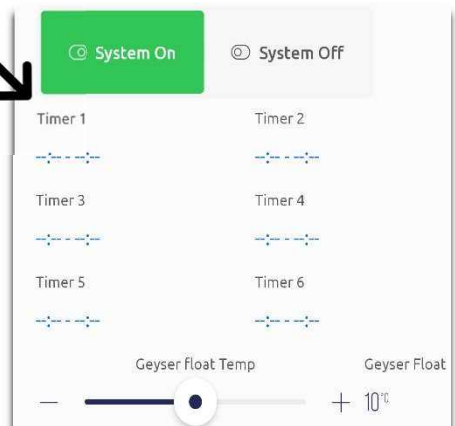
FIRST-TIME SETUP FOR GCU

SGCU users can skip to Page 25. This section will allow you to set up your system with recommended settings. You should follow the steps below if it is your first time using the GCU system. For more advanced settings go to Page 31.

Note: It is normal for the geyser to suddenly turn on during the setup as no timer has been set up yet.

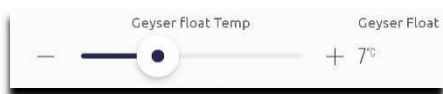


1. Set the desired Day/Night temperature by moving the sliders left or right. *It is recommended that you **do not exceed 60°C** the first time after installation.* Tap on the settings icon to proceed to set up timers for your system.



2. Tap on 'Timer 1' to set up your first schedule. **Do not use the Sunrise/Sunset functionality upon first use.** Find the guide on 'Timers' on Page 33. After

timers are set up, continue to the next page to set up the 'Geyser Float Temperature'.

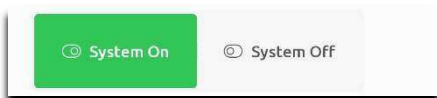


3. The 'Geyser Float Temperature' works in the following way:

$$\text{Target temperature} - \text{Float temperature} = \text{Trigger temperature}$$

As the geyser reaches the target temperature (Day/Night temperature) it will switch off the control unit and the temperature will slowly start to drop. When the temperature reaches the **trigger temperature**, the control unit will start heating the geyser again until it reaches the set temperature. It is therefore **recommended that the float temperature is set between 5°C and 10°C**. A larger float will result in the geyser running cold after using warm water and may take a long time to reheat.

4. Ensure the **system is ON** by tapping on the 'System On' switch on the mobile app. If the system is ON and healthy, the thumb icon should show up in the 'Geyser Tab'. If the thumb points down, it means the system is OFF or unhealthy.



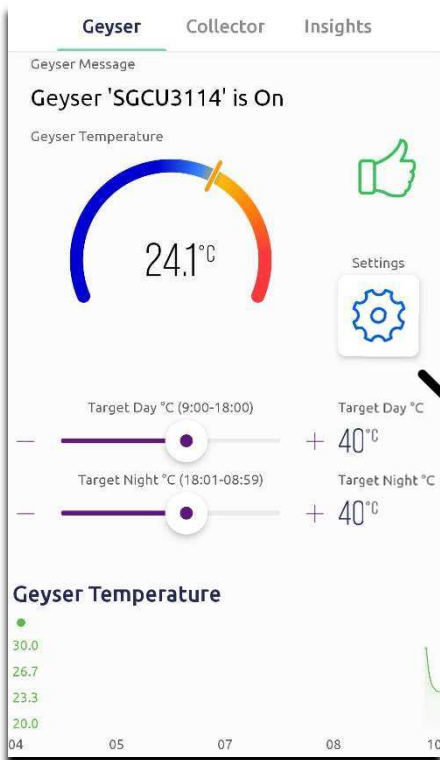
5. Go to the 'Insights Tab' by tapping on it. Here you can see all relevant information about your system in one place. For more information and a detailed explanation about insights, graphs, etc., refer to 'Mobile App Detailed Walkthrough' on Page 30.
6. If you are using Automations, please refer to the 'Automations Guide' on Page 42.

This concludes the basic setup for the GCU system. For more information about the application and its functions, please refer to the 'Mobile App Detailed Walkthrough' on Page 30.

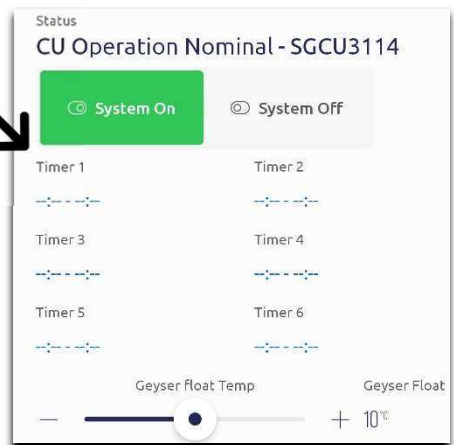
FIRST-TIME SETUP FOR SGCU

This section will allow you to set up your system with recommended settings. It is advised that you follow the steps below if it is your first time using the SGCU system. For more advanced settings go to Page 31.

Note: It is normal for the geyser to suddenly turn on during the setup as no timers have been set up yet.



1. Set the desired Day/Night temperature by moving the sliders left or right. *It is recommended that you **do not exceed 60°C** the first time after installation.* Tap on the settings icon to proceed to set up timers for your system.



2. Tap on 'Timer 1' to set up your first schedule. **Do not use the Sunrise/Sunset functionality upon first use.** Find the guide on 'Timers' on Page 33. After timers are set up continue to the next page to set up the geyser float temperature.

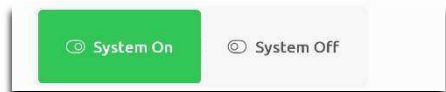


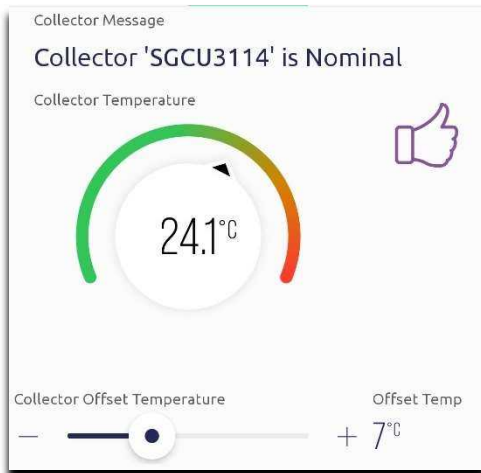
3. The geyser float temperature works in the following way:

$$\text{Target temperature} - \text{Float temperature} = \text{Trigger temperature}$$

As the geyser reaches the target temperature (Day/Night temperature) it will switch off the control unit and the temperature will slowly start to drop. When the temperature reaches the **trigger temperature**, the control unit will start heating the geyser again until it reaches the set temperature. It is therefore **recommended that the float temperature is set between 5°C and 10°C**. A larger float will result in the geyser running cold after using warm water and may take a long time to reheat.

4. Ensure the **system is ON** by tapping on the 'System On' switch on the mobile app. If the system is ON and healthy, the thumb icon should show up in the 'Geyser Tab'. If the thumb points down, it means the system is OFF or unhealthy.





- Go to the 'Collector' tab to set 'Collector Difference Temperature'. The 'Collector Difference Temperature' dictates how much warmer the collector can be in relation to the geyser before the pump cycles the water from the collector to the geyser. For example, if the difference is set to 5°C and the geyser temperature is 30°C, the pump will start circulating water once the collector reaches 35°C.

In other words, the collector difference temperature works as follows:

$$\text{Current geyser temperature} + \text{Collector difference temperature} = \text{Pump trigger temperature}$$

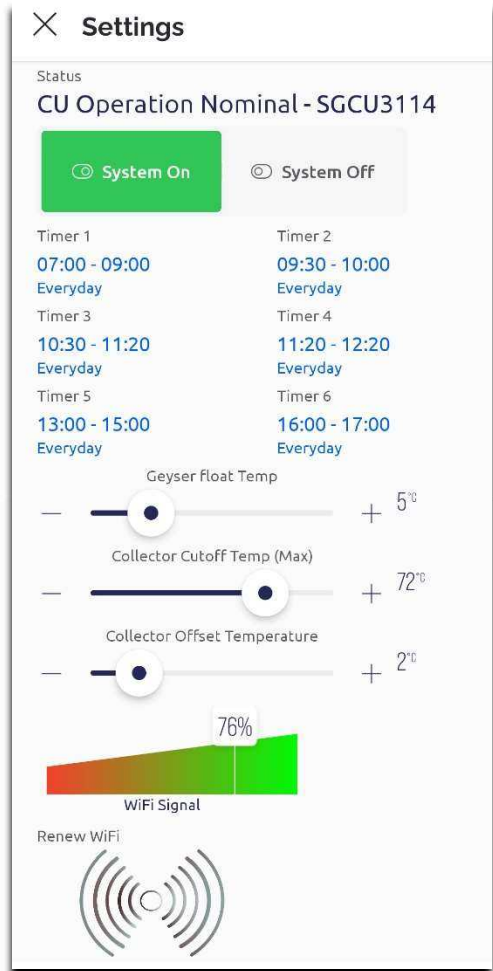


*It is recommended that the collector difference temperature be **set between 8°C and 15°C**. Ensure the pump trigger temperature does **not exceed 70°C**.*

6. Go back to the 'Settings' tab to set the 'Collector Cutoff Temp' and the 'Collector Offset Temp'.

The 'Collector Cutoff Temp' is the MAX temperature the collector can reach before the pump start circulating water in 3-minute intervals until the temperature drops below 5°C. *It is recommended to set this temperature to **at least 70°C**.*

The collector offset temperature is added to the collector difference temperature. This is useful on cold days to allow the collector to heat more than usual allowing it to heat the geyser when water is cycled through. See the example on the next page.



On a cold day (geyser below 30°C), the collector offset temperature works as follows:

$$\begin{aligned} & \text{Current geyser temperature} + \text{Collector difference temperature} \\ & + \text{Collector offset temperature} = \text{Pump trigger temperature} \end{aligned}$$



*It is recommended that the 'Collector Offset Temp' be **set between 1 - 5°C**. Ensure the pump trigger temperature does **not exceed 70°C**.*

5. In the mobile app, tap on the 'Insights' tab for relevant information about the system displayed all in one place. For more information and a detailed explanation about insights, graphs, etc., see the detailed walkthrough section.
6. Are you using Automations? If so, please refer to the 'Automations Guide' on Page 42.

This concludes the basic setup for the SGCU system. For more information about the application and its functions please refer to the 'Mobile App Detailed Walkthrough' on Page 30.

MOBILE APP DETAILED WALKTHROUGH

This section will explain the following:

- Timers, graphs, insights, etc.
- Additional settings
- EECO system

Geyser page walkthrough

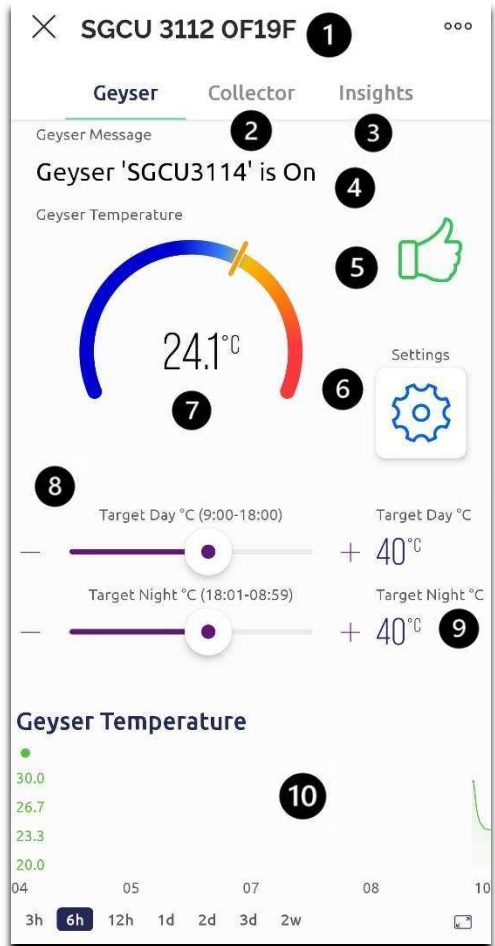
1. Factory default unit name
(Model, Firmware, Name)
(can be changed)
2. 'Collector' tab*
3. 'Insights' tab
4. Geyser message
5. System ON/OFF indicator
6. 'Settings'
7. Geyser temperature
8. Day/Night temperature sliders
9. Temperature in °C
10. Geyser temperature graph

On the 'Geyser' tab, you can:

- Select geyser temperature
- Go to 'Settings'
- View geyser temperature graph

To see the setup for the following, continue to the page indicated:

- 'Geyser temperature' (Page 34)
- 'Settings' (next page)
- 'Collector temperature' (Page 35)



Settings page walkthrough

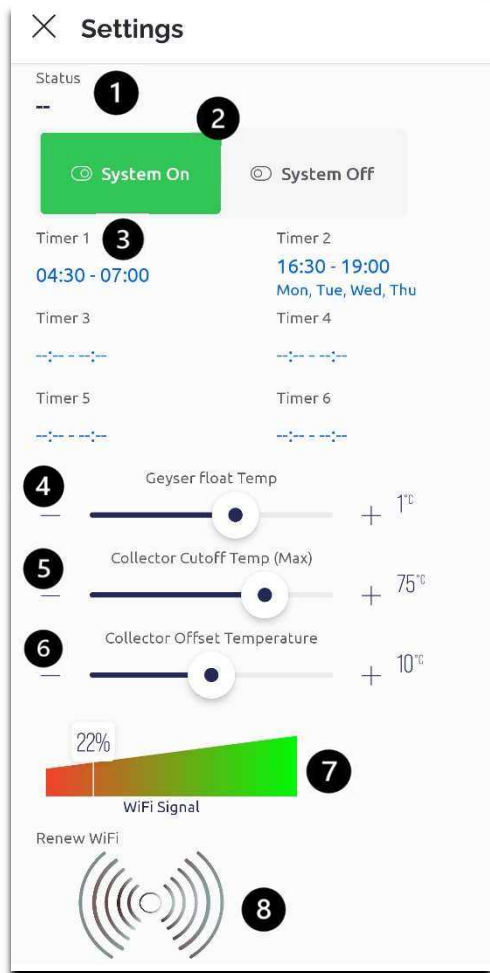
1. Control unit 'Status'
2. System ON/OFF switch
3. Timers
4. 'Geyser Float Temperature'
5. Collector MAX temperature*
6. 'Collector Offset Temp'*
7. WiFi signal strength
8. WiFi renew button

On the 'Settings' page you can:

- Turn the system ON/OFF
- Set up multiple timers
- Select geyser float temp.
- Select collector cutoff temp.
- Select collector offset temp.
- Renew the WiFi connection

To see the setup for the following, continue to the page indicated:

- 'Timer's (Page 33)
- 'Geyser temperature' (Page 34)



Note: It is recommended that the WiFi signal is at least 10%.

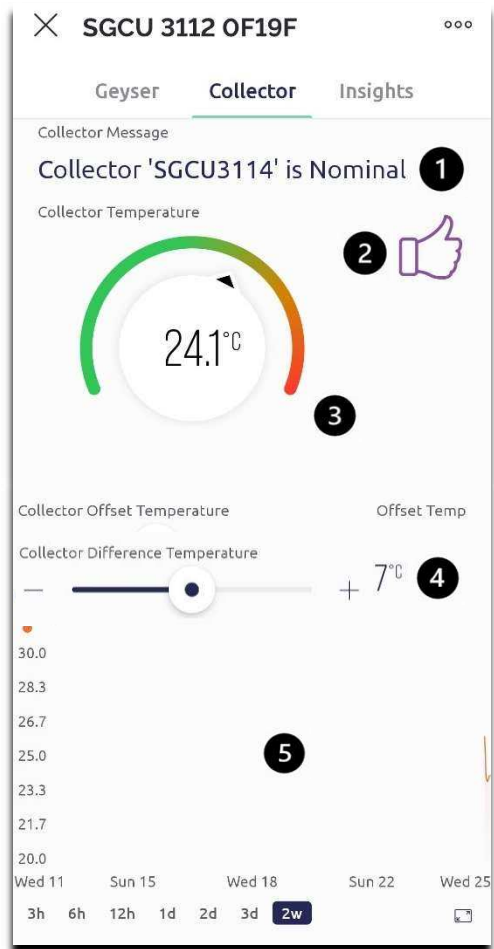
Collector page walkthrough

1. Collector message
2. Collector state
3. Collector temperature
4. 'Collector Difference Temp'
5. Collector temperature graph

On the 'Collector' tab, you can:

- Select the collector offset temperature
- View the collector temperature graph

To see the setup for the 'Collector Temperature', continue to Page 35.



TIMERS

Tapping on a timer slot will take you to a timer setup page, there is one for each of the 6 timers.

You will be able to select the days of the week and what time your geyser turns on and off. Tap on the day you would like the timer to function.

Tap on the 'START AT' and 'STOP AT' dropdown menu to select the exact time you desire the geyser to be on. Scroll up or down to set the hours, minutes and seconds. Select 'Done' or 'Save' (depending on your operating system) and OK to save your settings.

Android Timer

When a timer is set up successfully, the following will display in the settings.

IOS Timer

How to clear a timer



Disclaimer: Not clearing a timer correctly can result in the geyser turning ON unintentionally. To clear a timer, go to the timer settings and tap the **reset** or **clear** button. Ensure at least one day is selected.

GEYSER TEMPERATURE

This tab will allow you to set your preferred geyser temperature.

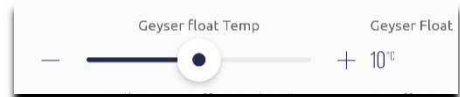
In the 'Geyser' tab, there are two temperature sliders that allow control over the geyser temperature during the day and night.

'Target Day' allows you to select the desired temperature (40°C ~ 60°C) for the geyser between 09:00 and 18:00.



'Target Night' allows you to select the desired temperature (40°C ~ 60°C) for the geyser is between 18:01 and 08:59.

'Geyser float temp' (found in 'Settings') allows you to select how much the geyser temperature can drop before the control unit turns the geyser back on. It works in the following way:



$$\text{Target temperature} - \text{Float temperature} = \text{Trigger temperature}$$

Once the geyser reaches the **trigger temperature (within a timer schedule)** the control unit will turn the geyser on to start reheating the geyser. *A value between 5°C ~ 10°C is recommended.*

COLLECTOR TEMPERATURE



'Collector Difference Temperature'

(found in the 'Collector' tab) allows you to select the maximum temperature the collector can be warmer than the

geyser. When the collector reaches this point, the control unit will signal the pump to start cycling water through the system. It works in the following way:

$$\text{Current geyser temperature} + \text{Collector difference temperature} = \text{Pump trigger temperature}$$

It is recommended to set the 'Collector Difference Temperature' **between 8-15°C**.

'Collector Cutoff Temp (Max)'

(found in 'Settings') allows you to select the maximum temperature the collector can reach before the control unit signals the pump to start cycling water from the collector to the geyser to cool it down. *It is recommended to set this to at least 70°C.*



'Collector Offset Temperature' is used on cold days (geyser below 30°C) to allow the collector to reach a higher temperature difference with the geyser before the pump starts to cycle water through the system. It works in the following way:

$$\text{Current geyser temperature} + \text{Collector difference temperature}$$

$$+ \text{Collector offset temperature} = \text{Pump trigger temperature}$$



*It is recommended that this be set **between 1°C ~ 5°C**. Total should **not exceed 70°C**.*

GRAPHS

Graphs provide an insightful view of the system's operation. The graph will allow you to see how your system reacts to the timers and temperature settings.

You can view any graph in a larger, more detailed, landscape mode by tapping the enlarge icon (1) in the bottom right corner. You are also able to adjust the scale of the graphs ranging from the last 3 hours to 2 weeks. If there are multiple graphs at once (as below), you also have the option to view 1 at a time by tapping on the graph name in the upper left corner. To return to portrait mode, tap the enlarge icon again.



INSIGHTS

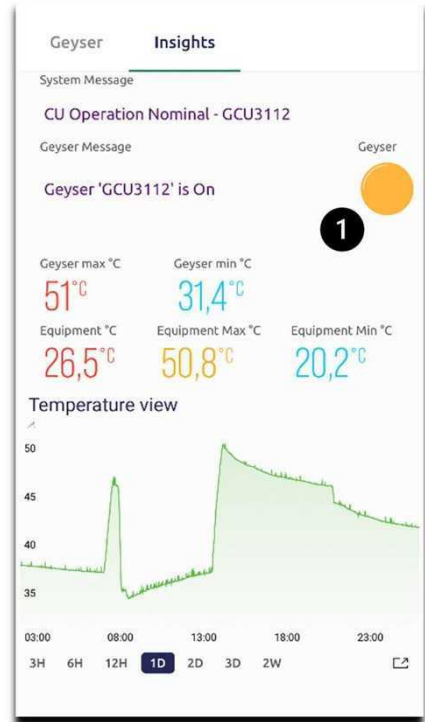
Insights provide you with all the relevant information about your system in one place.

GCU insights

On the 'Insights' page, you can see your main 'System Message' and 'Geyser Message'. Any errors that occur will appear under these messages.

Also available are the 'Geyser max' and 'Geyser min' temperatures of your geyser and GCU. Your GCU can operate effectively and safely between -5°C and 60°C, if you see the temperature exceed these limits (or often get close to them), contact your installer to move the unit to a more suitable location.

The 'Geyser' indicator (1) will turn orange when the geyser is heating, and white when off.



The geyser temperature is also graphed at the bottom of the screen which can be enlarged by tapping the icon in the bottom right corner. The scale can also be adjusted to view the last 3 hours to 2 weeks. By monitoring this graph, you will be able to see when the geyser is on and heating the water as per the pre-set timers.

SGCU insights

From the 'Insights' page, you can see your main 'System Message', 'Geyser Message' and 'Collector Message'. Any errors that occur will appear under these messages.

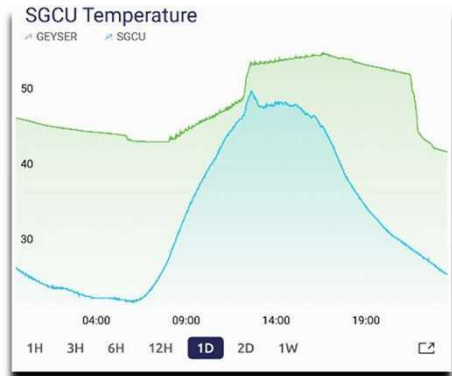
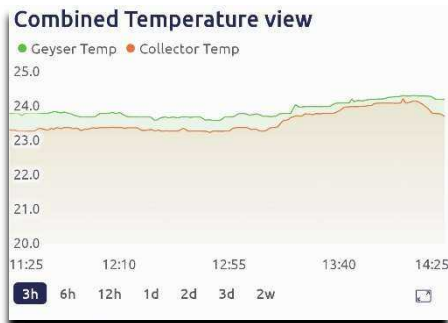
Also available are the 'Geyser max' and 'Geyser min' temperatures of your geyser, collector and SGCU. Your SGCU can operate effectively and safely between -5°C and 60°C, if you see the temperature exceed these limits (or often get close to them), contact your installer to move the unit to a more suitable location. There is also an indicator that shows if your geyser is currently heating and if your pump is active.

The 'Geyser' indicator (1) will turn orange when the geyser is heating, and white when off. The 'DC Pump' indicator (2) will turn red when the DC pump is circulating water between the collector and geyser, and white when off.

The geyser temperature vs collector temperature and geyser temperature vs SGCU temperature is graphed at the bottom of the screen which can be enlarged by tapping the icon in the bottom right corner. The scale can

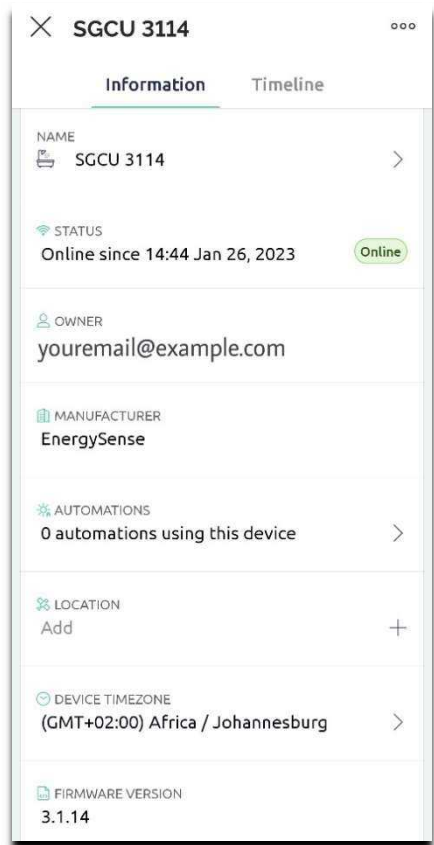
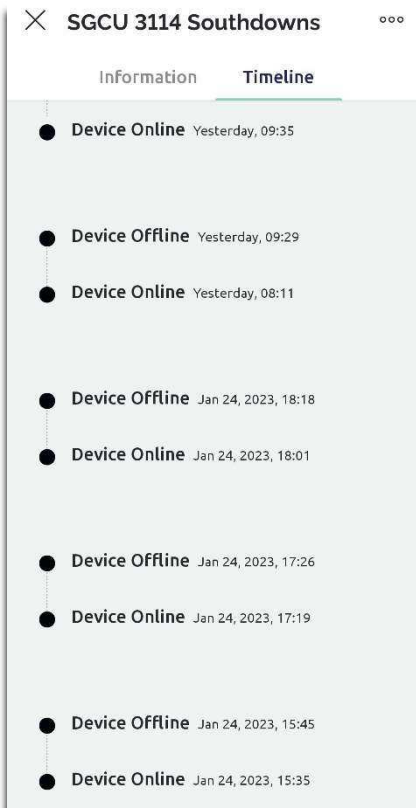


also be adjusted between the last hour and 2 weeks. Through monitoring this graph, you should be able to see if your control unit and timers are working as intended. If not, consult your settings to ensure everything is set up correctly or go to the “Troubleshooting” guide on Page 56.

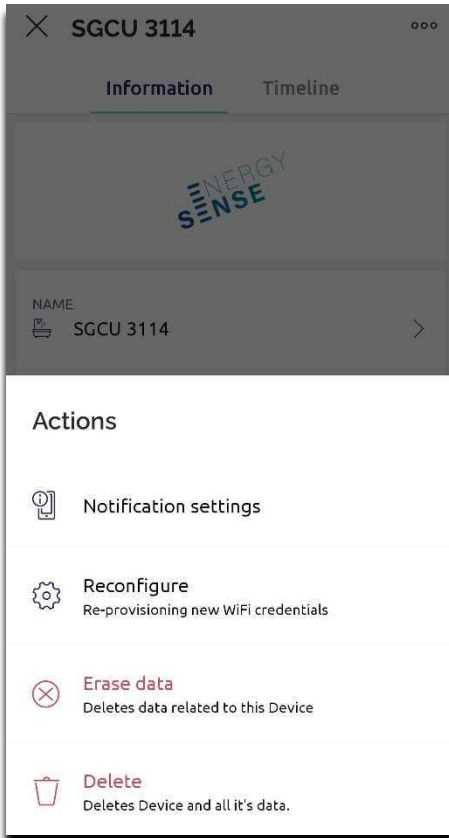


ADDITIONAL SETTINGS

By tapping on the three dots at the top right corner, you will be sent to additional settings where you will be able to rename your device, view “Automations”, activate/deactivate them, and view a timeline of your device which will show its activity and error message history.



The settings icon can be tapped a second time for more settings (only for use by certified installers).



Certified installers can:

Adjust your 'Notification settings'.

'Reconfigure' your device, which will prompt you to enter new WiFi details. This can be used when the WiFi SSID or Password changed or there are issues with your WiFi.

'Erase data' will keep the device registered on your phone but delete all accompanying data and history. To use the application after this again, it will take you back to the screen you saw when first set up the application upon installation.

'Delete' will completely remove the device from your phone along with all its data, settings and history.



Take care not to play around with these settings as you may accidentally erase or delete your data and device.

AUTOMATIONS GUIDE

What are automations?

Automations allow the end-user of the Energy Sense app to create scenarios where the device automatically performs one or more **action** based on a **condition**. **Note: Automations only work while the control unit is ONLINE.**

What are conditions?

A condition is a factor or state that acts as a trigger for an action. The following is a list of conditions:

- **Schedule:** Triggers an event based on the current date/time reaching a particular set of date/time value (all relative to a specified time zone)
- **Sunrise/Sunset:** Triggers an event when the time before/after Sunrise/Sunset occurs relative to a set of defined weekdays, at a specific geographic location
- **Device State:** Triggers an action based on the value of a data stream (device sensor or data point)
- **Scene:** Manually triggers an automation scenario from the mobile app

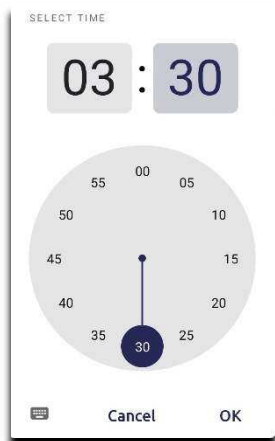
What are actions?

An action is a response the system has to a given trigger, for example:

- **Notification:** Sending a mobile app notification
- **Device Data:** Forwarding device data to another device data stream
- **Email:** Sending an email
- **Delay:** Setting a delay
- **Data Stream:** Setting a data stream value (change in value)

Selecting conditions schedule

Android



You will be prompted to select a time when the automation should take place. This is useful for automations you want to happen at a specific time.

IOS



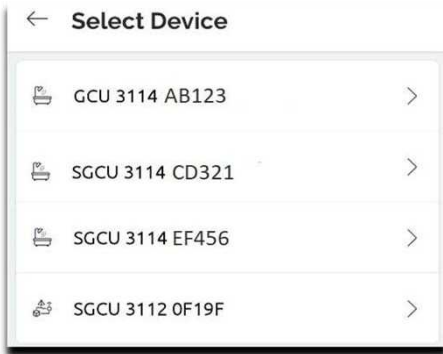
Sunrise/Sunset

You will be prompted to select a time ranging from 4 hours before Sunset/Sunrise to 4 hours after.



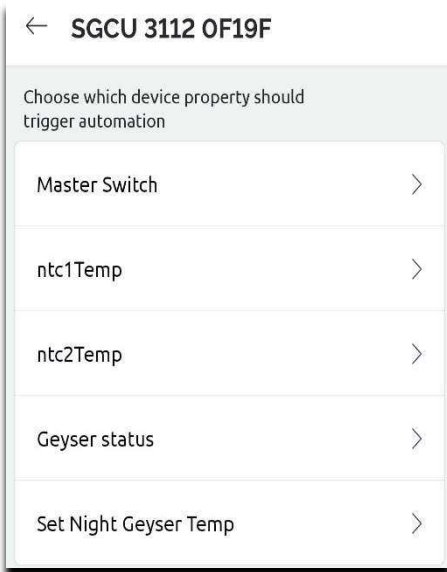
Schedule and Sunrise/Sunset will allow you to select what day an automation should be active. There is also the 'Run once' option which will take away the days of the week functionality and only work at the selected time.

Device state



Selecting the device state will first ask you to select the device it should work with.

After selecting a device, you will be asked what aspect to monitor.



Master Switch allows you to trigger an action when the master switch is on, off or changes.

'ntc1 Temp' (geyser) and **'ntc2 Temp'** (collector) allow you to trigger an action based on the geyser or collector temperature. You can specify for it to trigger on, above or below a certain temperature, or when the temperature is within a selected range.

'Geyser status' allows you to trigger an action when the geyser is ON, OFF or has changed

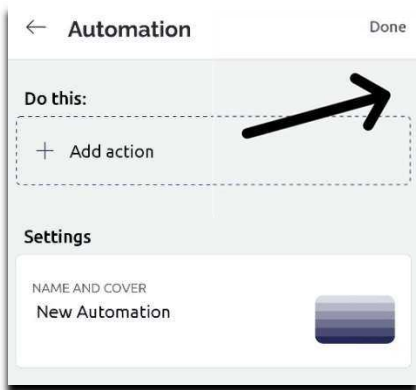
'Set Night Geyser Temp' allows you to trigger an action when the geyser night temperature is at, above or below a certain temperature, or when the temperature is within a selected range.

Scene

This option allows you to manually trigger an action. Upon selection, you will be taken directly to the action setup page.

Selecting actions

After selecting a condition, you will be taken to the action setup page where you can set up multiple actions and personalise them. Simply tap to add an action.

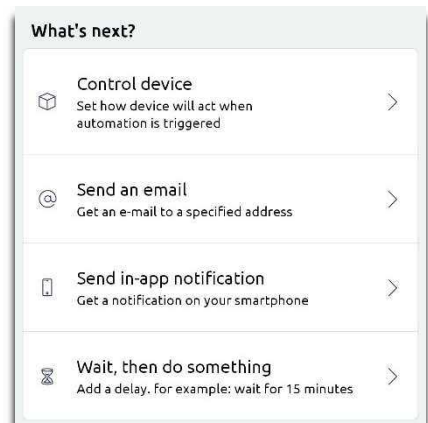


Tapping here will ask you to select what action you would like to take based on your condition.

In 'Settings', you can select your automation's name and personalise it with a colour or background.

You have the option to choose between:

- Control device
- Send an email
- Send in-app notification
- Wait, then do something



Control device

You will be asked to choose which device it needs to control. After selecting the appropriate device, it allows you to turn the 'Master Switch' (MS) ON/OFF, turn the 'Geyser status' (GS) ON/OFF or 'Set Night Geyser Temp'. If you select MS and ON, it will turn the MS OFF at activation and vice versa. Keep this in mind.



← **SGCU 3112 OF19F**

Choose device properties to include in automation, then set them to desired state

☐ Master Switch

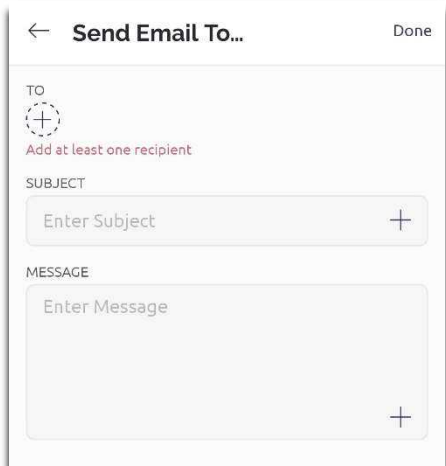
☐ Geyser status

☐ Set Night Geyser Temp

Send an email

Here you type the message that needs to be sent and give it a subject.

You can add multiple recipients to the message and the app will always add you as a recipient automatically.



← **Send Email To...** Done

TO

 Add at least one recipient

SUBJECT

Enter Subject +

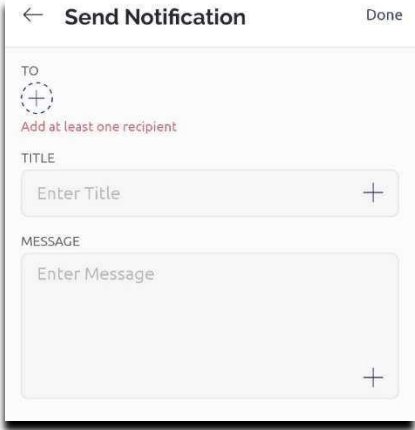
MESSAGE

Enter Message +

Send a notification

Here you type the message that needs to be sent and give it a title.

You can add multiple recipients to the message; the app will always add you as a recipient automatically.



The screenshot shows a mobile app interface for sending a notification. At the top, there is a back arrow, the title "Send Notification", and a "Done" button. Below the title, there is a "TO" section with a circular icon containing a plus sign and the text "Add at least one recipient" in red. Underneath is a "TITLE" section with a text input field labeled "Enter Title" and a plus icon on the right. Below that is a "MESSAGE" section with a larger text input field labeled "Enter Message" and a plus icon on the right.

Wait until

Adding a 'Wait until...' will ask you to set up a timer which will act as a countdown, or set a time, after which you can select another action, it should take after the wait is over.



The screenshot shows a mobile app interface for adding a wait action. At the top, there is a back arrow, the title "Add Wait", and a plus icon. Below the title, there are two radio button options: "Timer" and "Wait until...".

Sample holiday mode automation

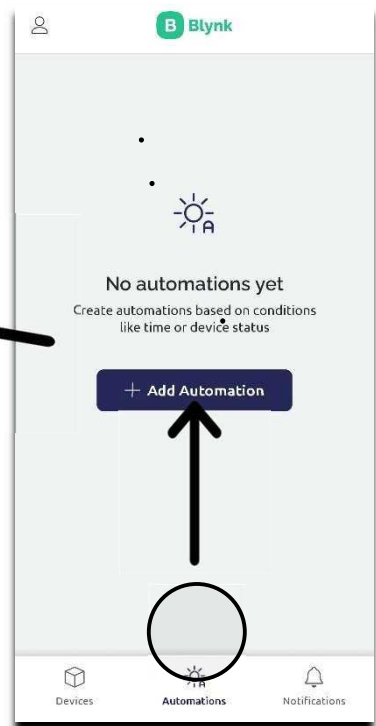
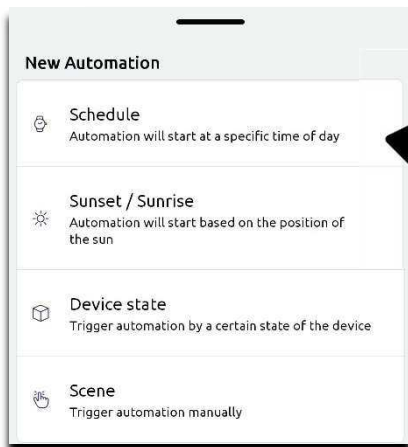
As an example, we will create an automation that will turn off the geyser while you are on vacation, then on your way home alert you when the geyser turns on and tells you if the geyser reaches a certain temperature.

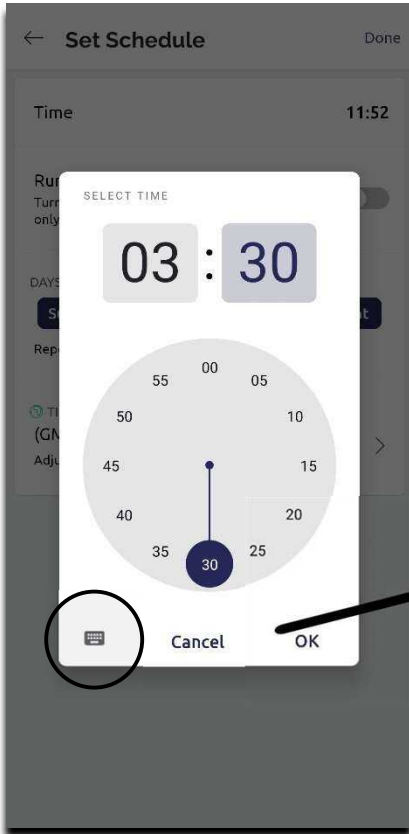
Let's say you go on vacation for a week and leave Monday at 04:00 AM and return on Sunday at 02:00 PM. This means the geyser should turn OFF Monday at 03:30 AM and turn ON Sunday at 01:00 PM. This will require two Automations. One to turn the geyser OFF and one to turn it ON.

1. Tap the 'Automation' icon at the bottom of the app home screen.
2. Tap on 'Add Automation' and select 'Schedule'.

Step 1

Step 2

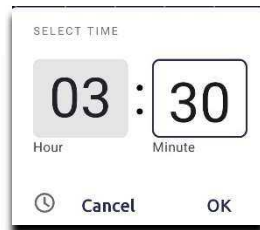




3. You will be prompted to select a time. Set the time for 03:30 AM and select Monday.

If you press the keyboard icon at the bottom left, a keyboard will appear to type in the time. When you are finished select OK.

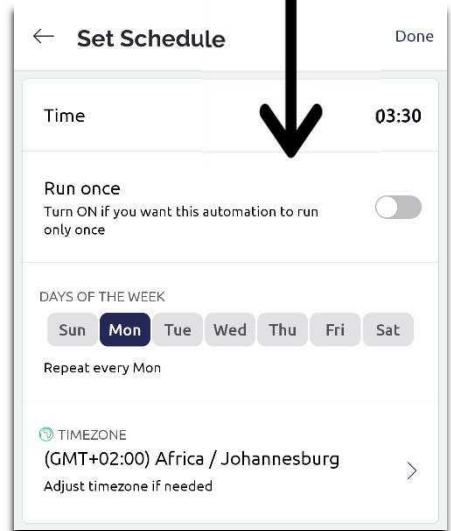
Step 3



4. For the weekday functionality to work, 'Run once' must be turned OFF.

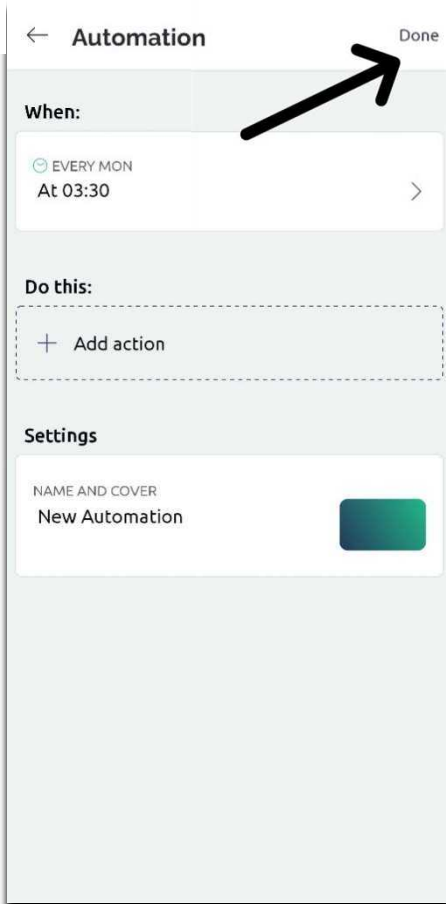
When it is turned ON the Automation will start as soon as the selected time arrives and is finished, and we want it to start on Monday only. Select 'Done'.

Step 4

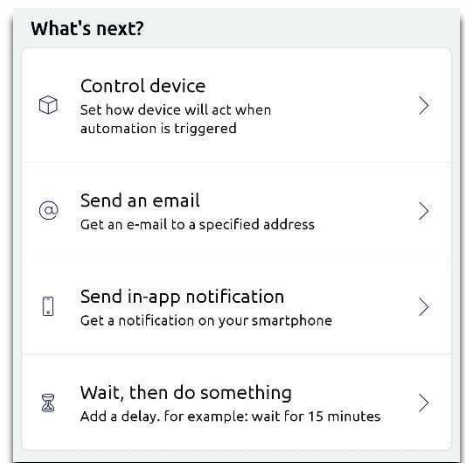


5. Select what the automation should do. We want to control a device so select 'Control device'. In this case, it should turn the system switch OFF. **Note: The selection switch has a reverse functionality, meaning if you activate it, it will turn OFF the system switch, if it is turned OFF it will turn ON the system switch.**

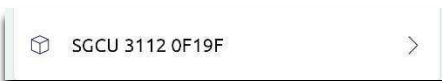
Step 5



Step 6

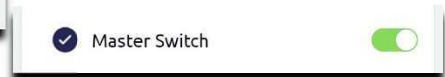


6. Next, you will be asked to select a device. Tap on your unit's name.

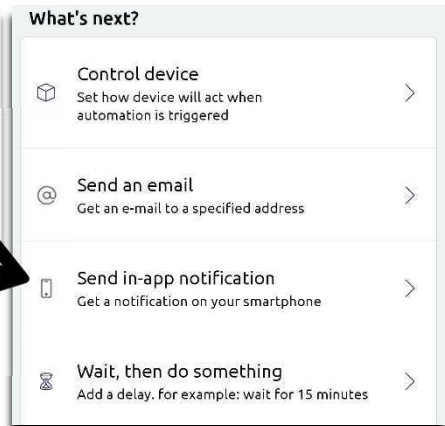


Step 7

7. You will now be asked what aspect of the device you want to control. Since we want to turn the geyser OFF, select the 'Master Switch' functionality and turn it ON. If we turn it ON here it will turn the system switch OFF. Tap on 'Done' to finish.



8. Now let's set up a notification to tell us that the system is indeed OFF. To do this, simply add another action.

Step 8

Tap on the + icon and proceed to select if you want to be notified by email or by the app. Let's select the app option.

Step 9

← **Send Notification** Done

TO
Add at least one recipient

TITLE
The Geyser is OFF

MESSAGE
enjoy the vacation

9. Now select the recipients of the message. The app will automatically add the creator of the automation as a recipient, name the notification and write a message.

10. Now you have completed the first automation setup. If you want to delete this automation or change the notification preferences, tap on 'Delete Automation'.

Step 10

← **Automation** Save

When:
EVERY FRI
At 03:30

Do this:
You can swipe to delete

SGCU 3112 0F19F
Master Switch

SEND NOTIFICATION
1 recipient

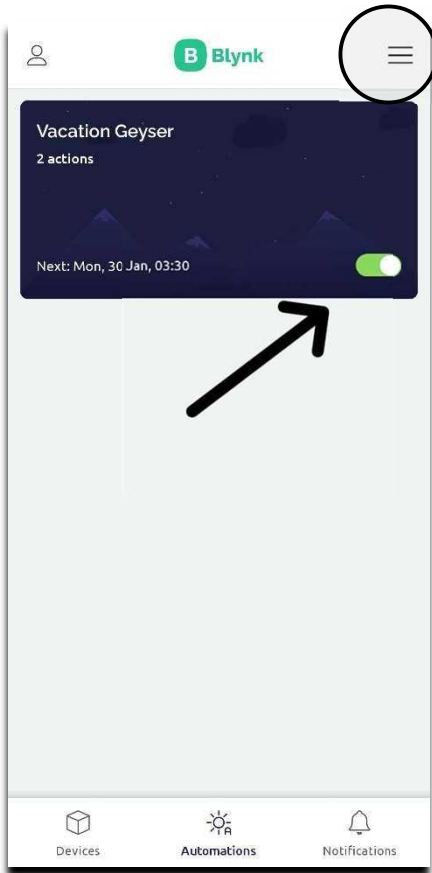
Settings

NAME AND COVER
Vacation Geyser

Notification settings

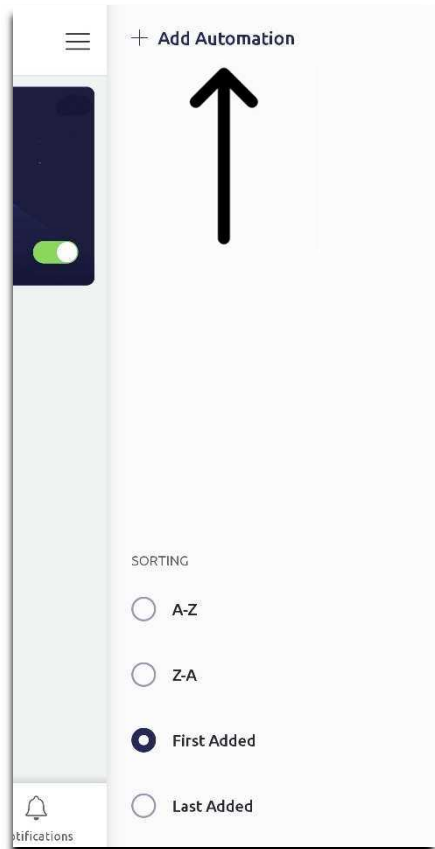
Delete Automation

Let's move on to the next part.



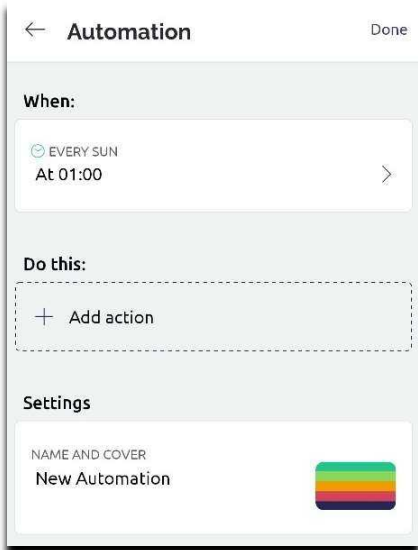
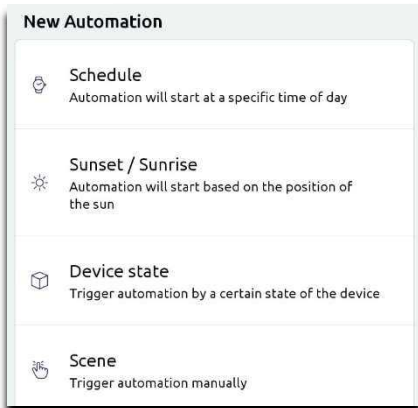
The automation displays after it is set up. Be sure it is activated for it to work.

To add more automations, tap on the three horizontal lines at the top right corner and select 'Add Automation'.

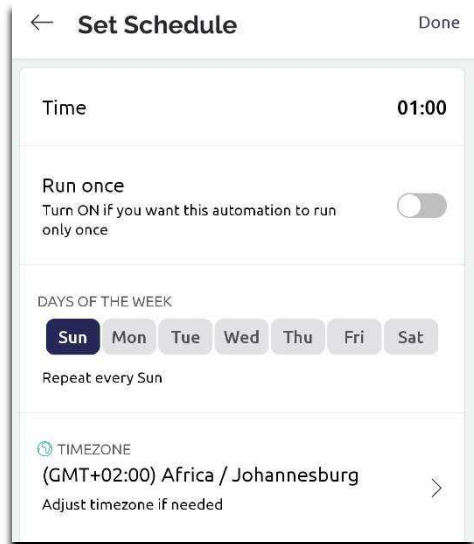


Since we are still working with a schedule, the steps are very similar to the first part, this time we create the automation to turn the geyser back ON when you return from leave.

Step 1

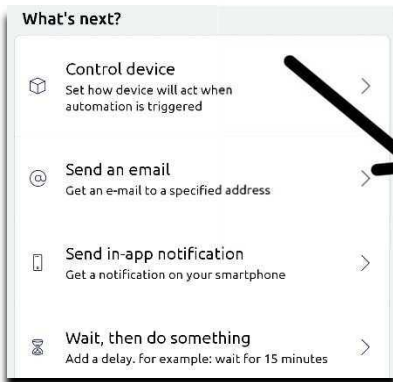


1. Select 'Schedule', then the time you want the geyser to turn back ON. 01:00 PM Sunday and turn OFF Run once and tap 'Done'.



Step 2

2. Select the 'Control device'



Step 2

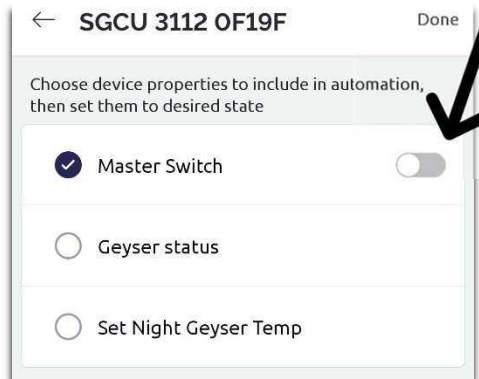
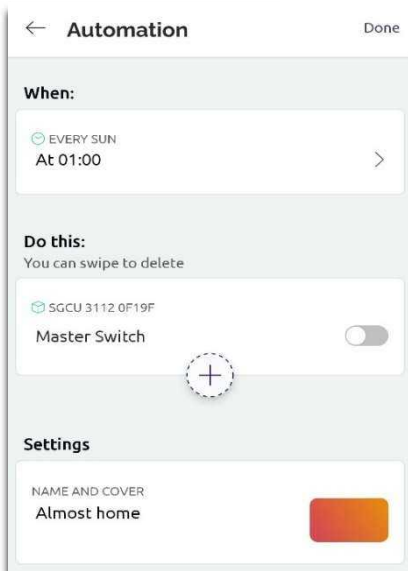
then, select your unit.



Select 'Master Switch', this time move the switch to the left, which will turn the geyser master back ON and press 'Done'.

3. Proceed with naming the automation and personalise it as before. Select done.

Step 3



You have successfully created automations that will turn your geyser master OFF at 03:30 AM Monday and back ON at 01:00 PM Sunday on your return from holiday.



TROUBLESHOOTING

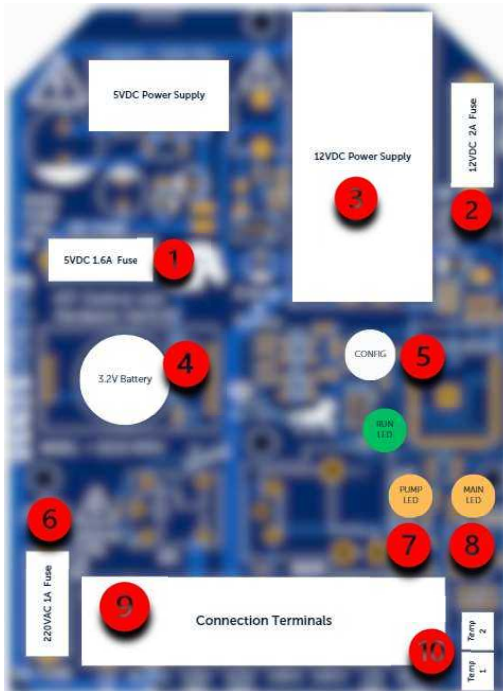


CAUTION! Ensure that the installation or repair complies with the relevant aspects of the law, regulations and standards. Only qualified service persons can service this unit. If errors persist after troubleshooting, please send the unit back to Energy Sense.

Status LED

LED Flash Sequence	Process
Installation/Setup	
500ms ON 50ms OFF	Reset and wait to connect to the App
200ms ON 200ms OFF	Waiting configuration
Normal Operation	
100ms ON 100ms OFF	Connected to cloud
80ms ON 80ms OFF	Connecting to network
Slow Dim & Bright (sweeping)	Running (
Upgrades	
50ms ON 50ms OFF	Over The Air (OTA) scheduled and emergency updates (Do not turn off the device while in progress)

Board layout



Temp probes 1 and 2

1. 5V Fuse
2. 12V Fuse
3. 12V Power Supply
4. Battery
5. Reset Configuration Button
6. AC Fuse
7. Pump LED
8. Main LED ()
9. Terminals
10. Temp probes 1 and 2

Note: Reset configuration is only to be used by certified installers.

Problem 1: The unit is offline

Follow the steps outlined in **A. 2. The Unit is offline** to get the unit back online.

Problem 2: Timers not working while the unit has power but show offline

Ensure timers were properly set up while the unit was online, as the unit uses the last saved timers in offline mode. The control unit uses a Li-Ion CR2032 battery to power its internal clock. To check the battery disconnect the control unit from the mains. Remove the battery and measure its voltage with a multimeter. If the voltage is below 2VDC, replace it with a similar approved CR2032 battery. If this issue occurs within six months of installation, it is unlikely

to be the battery, as they typically last up to three years. Review the rest of the troubleshooting steps for additional causes.

Battery disposal



*When replacing the battery, recycle the old one. Recycling in South Africa has limited options, either sign up to make use of a **special battery collection service**, or you can drop the old battery off at various **battery recycling centres or recycling points**.*

Problem 3: Cannot log into the account

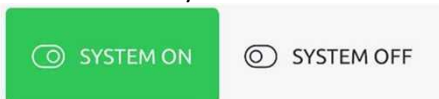
Contact customer service for more information at info@energysense.co.za

Problem 4: The Geyser is not heating

There are two causes for the unit not heating. The unit is online and not heating or the unit is offline and not heating. Follow the steps below applicable to the reason until the geyser starts heating.

4.1 Unit is online

- Go to the insights tab and check for any error messages.
- Check that the system button is ON.



- Are there any timers active or set up? If so, ensure that they are set up for the correct time and day.
- Check that the set target temperature (Day/Night) is higher than the current geyser temperature. If the geyser temperature is higher than the target temperature it should not be ON.
- Check the LED labelled main on the PCB, while the geyser should be heating it has to be ON and 220VAC should be present at the Live out terminals.
- Adjust the target temperature on the mobile app lower than the current geyser temperature and wait for ± 1 minute for the system to turn OFF the geyser. On the mobile app, raise the target temperature to at least

5°C higher than the current geyser temperature. Wait 30 seconds before continuing to the next step.

- Within 30 seconds the main LED should turn ON and 220VAC present at the Live-out terminals. Test for 220V on the Live-out. If 220V is measured, the problem may be wiring or the actual geyser element.
- If it turns ON and 220V is not measured at Live out, the main relay on the control unit may be defective and requires the unit to be sent in for repairs.
- If it stays OFF and there is no power to the geyser, the control unit may be defective and requires the unit to be sent in for repairs.

4.2 Unit is offline

- Check if there is load shedding or a power outage.
- Ensure the WiFi router and extenders (if installed) are on ON and have a stable internet connection.
- Check the timeline on your app for any errors that may provide details of why the unit is offline.
- Check that the appropriate circuit breaker feeding this unit is ON (in the upward position).
- Check that the property main breaker and earth leakage are both ON.
- If the breakers are ON, follow the next steps in sequence:
 - Switch OFF the circuit breaker and wait 10 seconds.
 - Switch it back ON and wait roughly 5 minutes. The control unit should complete the boot sequence within this time.
 - The Mobile App should appear online now.
 - If not, continue with the checklist.
- Switch OFF the WiFi (including extenders if you have any) and wait 10 seconds. Disable your mobile data for the next steps.
 - Switch on the router ONLY.
 - Wait until you can connect with the WiFi and test to see if there is a stable internet connection (for example try to open a social media app or perform an internet speed test).
 - If there are extenders, switch them ON next, wait 15 minutes and check if the unit is online.

- If you recently changed your WiFi router or SSID name or password, you have to reconfigure the unit. Continue to the app and select your device. Tap on the three horizontal lines at the upper right corner to go to additional settings. Once the page opens, tap the three dots at the top right corner, and more settings should appear on the screen. There you will find an option to reconfigure the device, tap on it and follow the instructions. Upon completion, you should see that the device is connected, and the unit is online. If the problem persists, see 'WiFi Troubleshooting' on Page 63 or contact customer support.

Problem 5: Pump is not turning ON*

5.1 Unit is online

- Go to the insights tab and check for error messages and the system's health.
- **Is the geyser ABOVE 30°C?** If yes, add your collector difference temperature to your current geyser temperature (let's call it X°C) and compare that answer to your collector temperature on your collector tab. Look at the collector temperature graph or insights to see if your collector ever reaches X°C. The pump will only turn ON (under normal circumstances) when the collector is equal to or above X°C.
 - If your collector reaches X°C, set the collector difference temperature low enough that the pump will trigger at the current geyser temperature, then go to the unit and measure the terminals (–12V and +12V) with a multimeter. You should measure 12VDC.
 - If your collector does not reach X°C, the pump is not supposed to turn ON. If the collector is getting too hot for your preference, consider lowering the collector difference temperature, keeping in mind that it is recommended for best performance to keep it between 8-15°C.

- **Is the geyser BELOW 30°C?** If yes, add your collector difference temperature and collector offset temperature to your current geyser temperature (let's call it Y°C) and compare that answer to your collector temperature on your collector tab. Look at the collector temperature graph and see if your collector ever reaches Y°C. The pump will only turn ON (under normal circumstances) when the collector is at or above Y°C.
- Check if the 12V power supply LED is ON.
- Check the fuse marked 12V.
- Check if the pump LED is ON when the pump should turn ON and measure the DC out terminals for 12V.
 - If the pump LED is ON and 12V present at terminals, there is a possible problem with the pump wiring or with the pump.
 - If ON and 12V are not present at terminals, there is possibly a problem with the pump relay and the unit needs to be sent in for repairs.

5.2 Unit is offline

- Follow the steps outlined in **4.2 UNIT IS OFFLINE** found on Page 59. Wait for 5 minutes for the unit to return online. If the problem is not resolved, follow the steps in **5.1 UNIT IS ONLINE**.

Hardware quick troubleshooting

Problem	Possible Solution
No power	Check AC supply. Measure with a multimeter. If no supply, check the AC fuse.
No power to the processing unit	Check fuse marked 5V.
No power to the geyser	Check the Live (L) terminal against Neutral (N) with a multimeter. (It should read +/- 220V) Check geyser connections with a multimeter.
No power to pump*	Check fuse marked 12V.

Problem	Possible Solution
Temp probe giving high negative value or Not a Number (NAN) on the app	Check probe resistance by unplugging and then measure with a multimeter for a value +/- 10kΩ. If it measures open or Short circuit the probe is faulty.

Mobile app quick troubleshooting

Problem	Possible Solution
Mobile device not picking up GCU/SGCU	Ensure the mobile device is connected to the internet. Ensure CU is powered. Add the device manually (Page 19). Restart the mobile app. Restart the mobile device. Restart the WiFi router and wait until the WiFi signal is available. Reboot CU and wait 5 minutes.
Mobile device not connecting to GCU/SGCU	Ensure your mobile device, WiFi router and GCU/SGCU are within range of each other. Restart the mobile app, mobile device, and the WiFi router. Wait until the WiFi signal is available, then reboot the CU and wait 1-2 minutes.

WIFI TROUBLESHOOTING GUIDE

If you experience intermittent or no WiFi connection, please refer to these guidelines:

Pre-checks: Ensure the following before proceeding::

A. WiFi Channel Selection

Recommended Channels: The control unit operates optimally on WiFi channels 1 through 11. Channels 13 and 14 are incompatible.

Exclusive Channel Use: Assign channel 6 exclusively to the control unit to minimise interference.

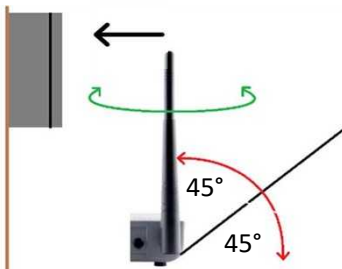
Procedure: Power off the control unit. Access your router's settings to change the WiFi channel to 6. Power on the control unit after making the change.

B. Router Antenna Positioning

Optimal Angle: Position your router's antennas at a 45° angle away from the control unit.

Signal Adjustment: After each adjustment, wait at least 3 minutes to observe signal changes. Aim for the antenna orientation that provides the strongest signal to the control unit.

Control Unit Face



C. Recent Changes to WiFi Credentials

SSID and Password Updates: If you've recently changed your WiFi network name (SSID) or password, reconfigure your control unit with the new credentials.

Reference: See 'Additional Settings' on Page 40 for reconfiguration instructions.

D. Addressing Weak Signal Display on the Unit

- A) Router Signal Strength - Adjustment: Many routers allow signal power adjustments. Action: Increase the signal strength and monitor for improvements.
- B) Unit Placement - Optimal Positioning: Minimize the number of walls and large objects between the router and the control unit. If relocating the router isn't feasible, consider using a WiFi extender near the unit.
Recommendation: Powerline extenders are particularly effective with the control unit.

E. Utilizing WiFi Extenders

It is recommended to use powerline extenders with the control unit.

- A) Extender Connectivity - Verification: Ensure your WiFi extender has an active internet connection. Uniform Credentials: For multiple extenders, use the same SSID and password to create a seamless mesh network.
- B) Proximity Considerations - Connection Stability: If the control unit is near both the router and an extender, it may switch between them during auto-renewal. Ensure all extenders provide strong signals and stable internet connections. Action for Sudden Disconnections: Press the 'Renew WiFi' button on the control unit. Reference: Consult your WiFi extender's installation guide for detailed instructions.

F. Standard WiFi Extender Reboot Procedure

- A) Standard WiFi Extender Reboot Procedure – Control unit, Router, Extender. Wait 15min.
- B) Power on sequence - Router – Wait for an active internet connection. Extender – Confirm internet connectivity. Control Unit.

G. Understanding WiFi Reconnect Cycles

- A) Scenario 1: WiFi Available but No Internet - Behavior: The control unit attempts to reconnect every 15 minutes until an internet connection is established.
- B) Scenario 2: No WiFi Signal – Behavior: The control unit continuously tries to reconnect and will reboot every 45 minutes if the geyser is off or has completed its current cycle.

H. Additional Tips

- A) Router Placement: Position your router centrally and elevated to enhance coverage.
- B) Firmware Updates: Regularly update your router's firmware to improve performance and security.
- C) Interference Reduction: Keep the router away from potential interference sources like television sets, microwaves and cordless phones.
- D) Device Compatibility: Ensure your control unit is connected to a WiFi network that operates on the 2.4GHz frequency band, as it is not compatible with 5GHz networks.

SPECIFICATIONS

Technical Information	
AC Input	
Voltage	220V ~ 250V – Nominal 230VAC
Max Power (Control unit + Switching)	5750W
Frequency	50Hz
Control Unit Protection fuse	1Amp
AC Output	
Input Voltage	220Vac ~ 230Vac (Max 250Vac)
Input Power	3000W (Max 5500W)
Input Amp	16Aac (Max 20Aac)
DC Output	
Voltage	12V
Max Current	2A
Nominal Current	<1A
Max Power	12W
Protection fuse	1.6Amp – 2Amp
General	
Operating temperature	-5°C ~ 65°C
WiFi	2.4GHz (Ch. 1-11)
Enclosure	IP65 (190mm x 140mm x 75mm)
Temperature	
Probe type	NTC 10K
Measuring range – GCU	5°C ~ 75°C
Measuring range – SGCU	-5°C ~ 98°C
Measuring accuracy	1% - 5°C ~ 75°C 2% - 76°C ~ 100°C
Cut off - GCU	70°C
*Cut-off – SGCU Geyser	70°C (77°C Collector heating)
*Cut-off – SGCU Collector	95°C

Customer support

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Document Revision		
Description	Document Rev	Date
First Release	0.00	2022-10-03
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