

NOTE: This Troubleshooting Guide is intended for electricians and not general users. Users should please refer to the User Manual, which can be found at www.poweroptimal.com/manuals. Always check the PowerOptimal website for the latest version of this guide.

Unit no.	Development name	Elon® serial no.
Date	Name: 1 st level support person	
Unit construction status (Works OR Final Completion)	Resident name	
Reported issue (customer)		
Reported issue (Level 1 Support)		

Troubleshooting Steps

No.	Action	Result	Units
1	Open the Elon Smart app. (Download the Elon Smart Water app from the Google Play or Apple app stores if you don't have it installed on your phone. Make sure that you have the latest version of the app – you can check by searching “Elon Smart Water” in your app store and tapping “Update”.)	<input type="checkbox"/>	
2	If you don't have the specific thermostat in your device list, scan its QR code (on the house DB or on the thermostat itself) to add it by tapping the + button in the Elon Smart app.	<input type="checkbox"/>	
3	Open the Thermostat Settings screen by tapping the Settings button (the gear icon) to the right of the thermostat on the app status screen.	<input type="checkbox"/>	
4	Check for any alarms at the bottom of the screen and rectify accordingly (See list of alarms at the end of this guide)	<input type="checkbox"/>	
5	If you cannot access the thermostat from the app, confirm that <ul style="list-style-type: none"> a. the DC isolator / circuit breaker is closed (on); b. the AC circuit breaker at DB and AC isolator are closed (on). 	<input type="checkbox"/>	DC closed
		<input type="checkbox"/>	AC closed
6	If you still cannot access the thermostat from the app, remove the geyser end cover and: <ul style="list-style-type: none"> a. Visually inspect the wiring ensuring that AC and DC wiring are still inserted into screw terminals; b. Check using a voltage meter that DC voltage is present on the DC screw terminals and polarity is not reversed (Figure 1); c. Check using a voltage meter that AC voltage is present on the AC screw terminals (Figure 2). 	<input type="checkbox"/>	Wiring correct
			V DC & correct polarity
			V AC
7	Write down the conclusion from your testing (What caused the reported issue?) & any other observations:		

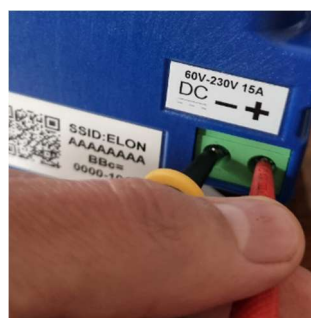


Fig 1 Checking DC voltage



Fig 2 Checking AC voltage

Things to Remember

- After power up, the unit **runs a self-test that takes about 30 seconds**. Once the self-test passes the unit will engage the correct power source determined by the heating profile. If the water temperature is lower than the temperature set point for the source (Grid or Solar), it will start heating water. You should hear a click when this happens.
- **Make sure that the wires are connected to the Elon Smart terminals securely** (do a tug test with AC & DC power to the Elon Smart switched off) and check that the terminals have not been damaged (for example by overtightening).
- **If the two earth wires are not connected to the earth stud** the unit will fail the self-test and never start the heating process.
- **Check for any geyser timers** and bypass them completely or set them to “always on”.
- If you are having DC power supply issues, **check if the DC circuit breaker or isolator is faulty** by measuring the voltage across the DC circuit breaker or isolator whilst DC power is being supplied to the element. If there is a voltage drop across the disconnect switch, it is faulty and needs to be replaced. **Also check all DC fuses if installed.**
- **The unit will detect the following installation faults** and display them on the configuration screen. These will stop the unit from connecting power to the element until they are cleared:
 1. DC + and DC – are reversed (reversed polarity);
 2. The earth straps are not connected to the earth stud;
 3. AC is connected to DC input;
 4. There is a fault between the solar wiring and earth (insulation failure);
 5. Element faulty (this may happen if you insert the unit so only a single spade connector makes contact with the element);
 6. Unit component failure.
- **The unit will also warn the installer** if there is:
 1. No power on the AC input. The alarm is not shown if heating profile *Solar Only* is selected.
 2. No power on the DC input and it is daytime. The alarm is not shown if heating profile *Grid Only* is selected.
- For any Heating profile except *Grid Only*, solar power is normally engaged except for the periods listed in the **table below**.
- If the unit has no grid power and engaging the element causes the DC voltage of the solar panels to drop below the voltage required to power the unit, the unit disconnects the element. If AC power is supplied, then the unit can run down to 0 V on DC. If the unit disconnects the element, it will stay disconnected for 2 minutes before connecting to the element again.
- If the unit is connected to the grid, it may draw a small amount of power (<3W) from the grid even if *Solar Only* heating profile is selected.
- **How to switch on solar power to element:** Select *Solar Only* heating profile on the configuration screen.
- **How to switch on mains power to element:** Select *Grid Only* heating profile on the configuration screen.

Heating Profile option	Solar power use	Grid power use	Comments
Grid Only	Never	Always	Select this option if you don't have any solar panels installed.
Solar Only	Always	Never	ONLY use solar power. NEVER use grid power.
Morning Shower	Always except for 3 – 5 am	3 am – 5 am	Solar power will be used whenever available, and grid power will only be used early in the morning to boost water temperature to the Grid set point if the temperature is lower than that.

Heating Profile option	Solar power use	Grid power use	Comments
Evening Shower	Always except for 5 – 7 pm	5 pm – 7 pm	Solar power will be used whenever available, and grid power will only be used in the late afternoon to boost water temperature to the Grid set point if the temperature is lower than that.
Morning and Evening Shower	Always except for 3 – 5 am & 5 – 7 pm	3 am – 5 am & 5 pm – 7 pm	Solar power will be used whenever available, and grid power will only be used in the early morning and late afternoon to boost water temperature to the Grid set point if the temperature is lower than that.
Holiday Mode	Off	Off	System switched off completely
Custom Profile	Whenever not in grid mode	Custom	Use the Custom Profile option to set your own grid heating timers.


List of Alarms and How to Resolve Them

The Elon Smart has a helpful alarm system that detects and reports common issues. See the below list for the various alarms and how to resolve them.

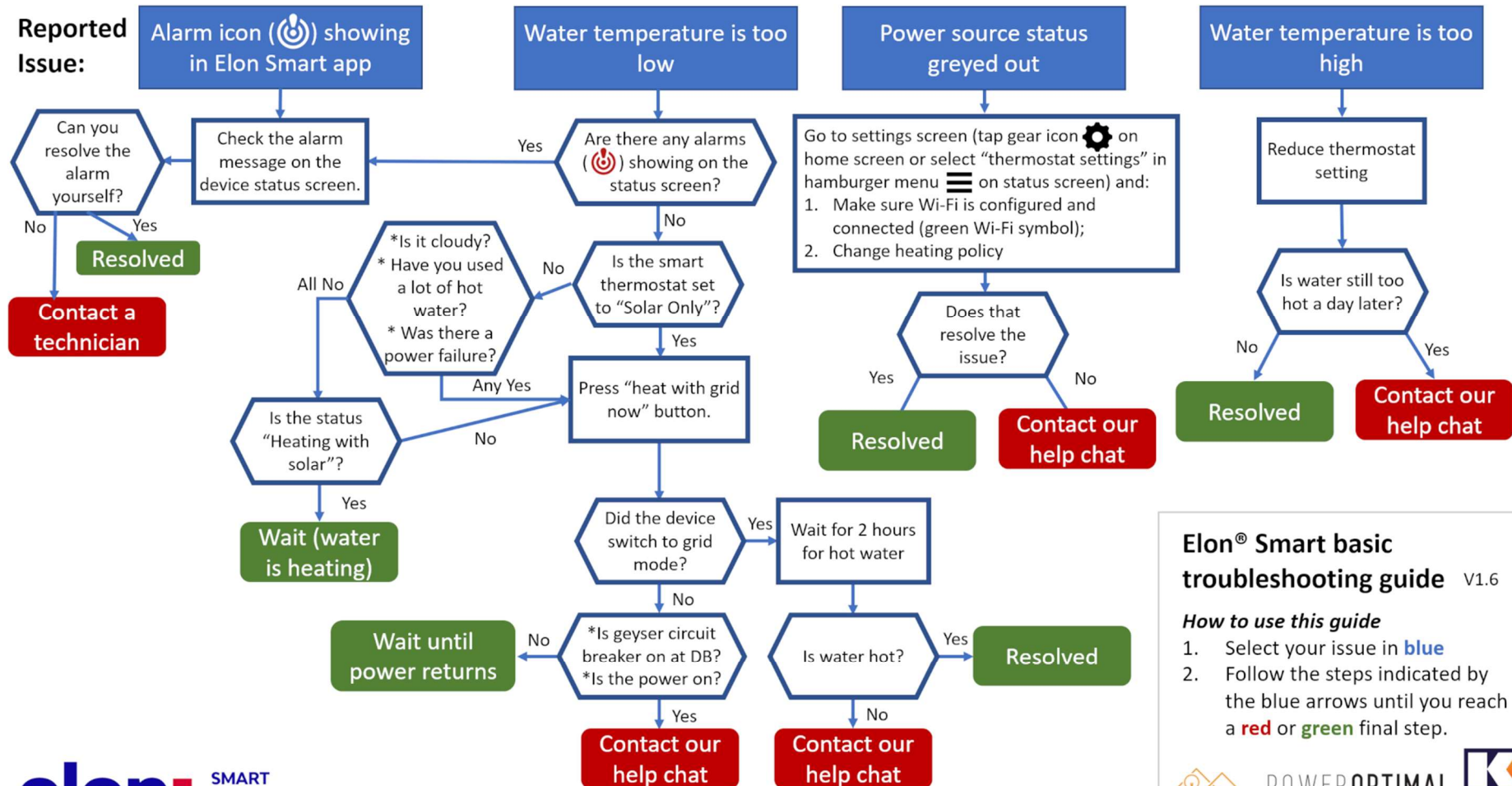
Always check that you have the **latest version of the app** by going to the “Elon Smart Water” app in your app store.

ID	Alarm message	How to resolve the alarm
0	Element Faulty	a. Check that the thermostat is inserted correctly. b. If that does not clear the alarm, measure element resistance and replace if necessary.
1	Switch Failed	Contact our help chat
2	DC Disconnect Failed	Contact our help chat
3	No Power on AC Input	This can be due to several reasons: a. There is no AC power connected to the Elon Smart b. AC power is off at the circuit breaker in the DB board or at the AC isolator close by the Elon Smart unit. c. There is a power failure or loadshedding. d. You have a geyser timer installed. This alarm won't prevent the Elon Smart unit from functioning and heating water with solar (DC) power as long as there is solar power available. You can clear the alarm by switching the AC power on (where applicable), setting the Elon Smart heating profile to <i>Solar Only</i> or you can leave it until AC power returns.
4	Measurement Failure	Contact our help chat
5	Disconnected for Safety	When there is a safety-related alarm condition, the Elon Smart will disconnect power from the geyser. To clear this alarm, you need to clear the other safety-related alarm(s).
6	Water Temperature Measurement Failure	Contact our help chat

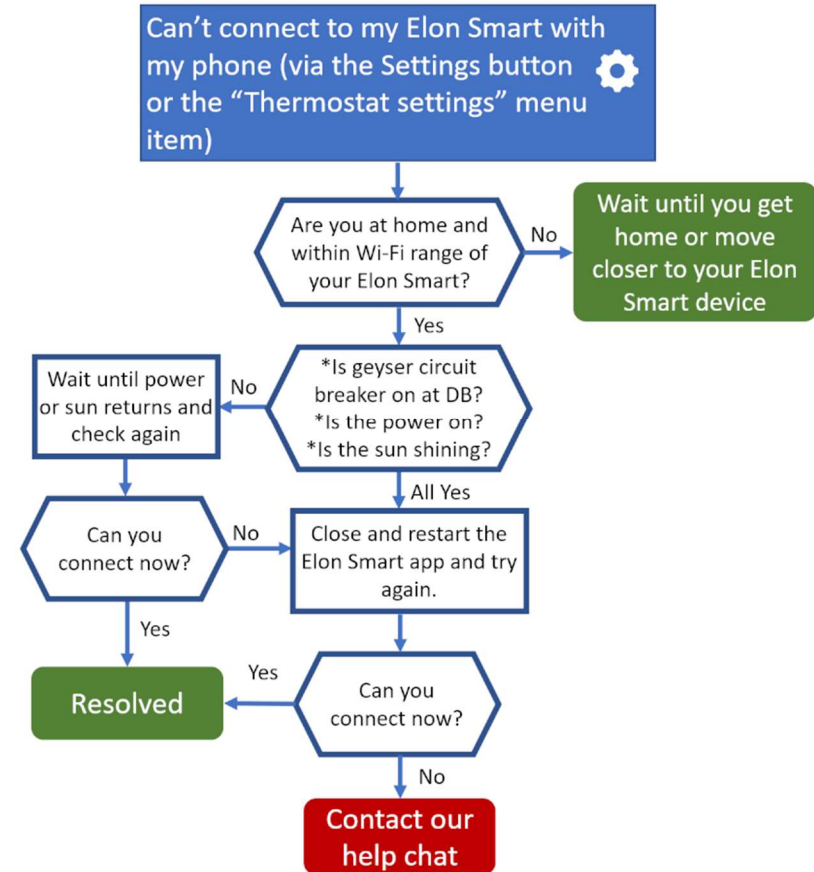
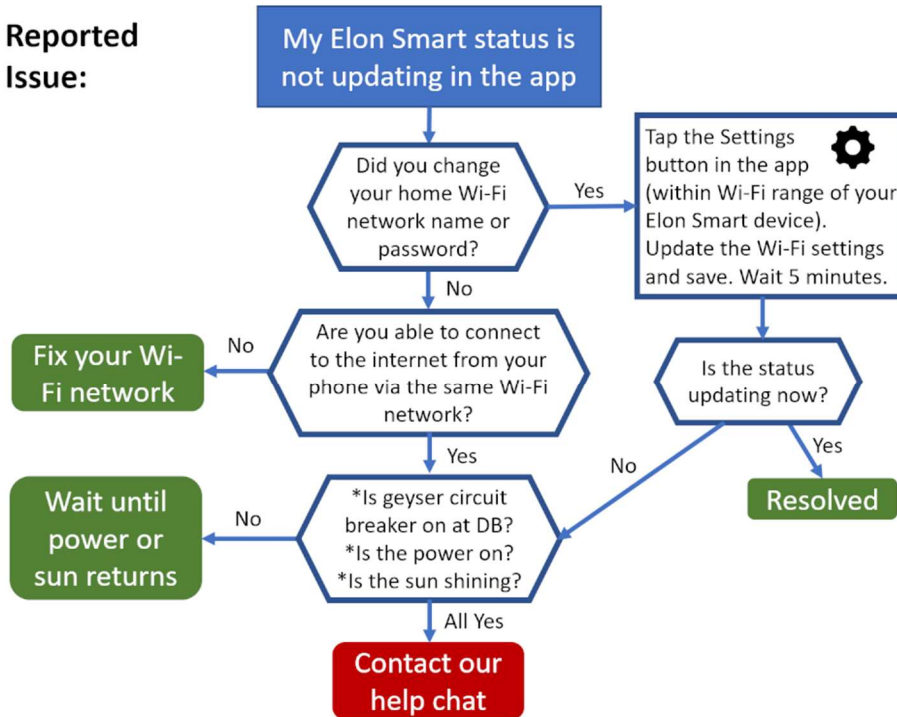
ID	Alarm message	How to resolve the alarm
7	Ambient Temperature Exceeded	<ul style="list-style-type: none"> a. Check the installation. If the geyser is installed in direct sunlight, see if you can provide shade to the geyser end space area where the Elon Smart is located. b. Reduce temperature set point by 5 degrees. c. Wait until temperatures cool down. The Elon Smart will start up again. d. Contact our help chat if the above doesn't clear the alarm.
8	DC Wiring Insulation Failure	<ul style="list-style-type: none"> a. Check solar panels and DC wiring for insulation faults. b. To operate the Elon Smart whilst the insulation fault has not been located and resolved, you can set the heating profile to <i>Grid Only</i> or switch off the DC disconnect switch.
9	Insulation Self-Test Failed	Check earth wiring. Make sure both earth straps are connected securely to the geyser earth stud.
10	AC Wired to DC Input	Wire AC to correct input (see Chapter 4 in the Installation Manual).
11	DC Wired to AC Input	Wire DC to correct input (see Chapter 4 in the Installation Manual).
12	No Power on DC Input	<p>This can be due to several reasons:</p> <ul style="list-style-type: none"> a. There is no DC power connected to the Elon Smart b. DC power is off at the DC disconnect switch close by the Elon Smart unit. c. There is an issue with the DC wiring or solar PV installation. d. It is extremely dark and overcast during daytime. (The alarm is not active when the sun is less than 15 degrees above the horizon.) <p>This alarm won't prevent the Elon Smart unit from functioning and heating water with grid (AC) power as long as there is grid power available.</p> <p>You can clear the alarm by switching the DC power on (where applicable), fixing the DC wiring / solar PV installation, setting the Elon Smart heating profile to <i>Grid Only</i> (see Table 4.1) or you can leave it until DC power returns.</p>
13	DC Input Reversed	The wiring on the Solar input has been installed incorrectly (in reverse). The DC+ (positive) wire has been connected to the DC- (negative) terminal on the Elon Smart and the DC- (negative) wire has been connected to the DC+ (positive) terminal on the Elon Smart. Swap the DC wires around (see Chapter 4 in the Installation Manual).
14	Hot Connection	Elon Smart not correctly inserted into geyser element. Switch off all power to the Elon Smart and re-seat (reinsert) the Elon Smart.

ID	Alarm message	How to resolve the alarm
15	RTC Failed	Contact our help chat
16	Power Unstable	<p>If it is intermittent or temporary and occurring during loadshedding or grid power failures, you can ignore this alarm.</p> <p>If the alarm persists whilst grid power is available, check the following:</p> <ol style="list-style-type: none"> Check that wiring to Elon Smart is properly connected and not loose. Check whether geyser circuit breaker in DB or the geyser's AC isolator are faulty or wiring is not properly connected. If none of the above are present, then contact our help chat.
17	Server Not Available	<ol style="list-style-type: none"> Check that the home Wi-Fi network has internet connectivity. Check the Elon Smart Wi-Fi settings on the thermostat settings screen (access by tapping the gear icon  in the app when within Wi-Fi range of the Elon Smart). If the Wi-Fi router is far away from the geyser, the Wi-Fi signal might be too weak. This can be improved with a Wi-Fi extender or signal booster. <p>If none of the above works, try rebooting the Elon Smart by switching off both the AC isolator (or geyser circuit breaker on the house DB) and the DC circuit breaker for 2 minutes.</p>

The below basic troubleshooting guide for users might also be of use to you.



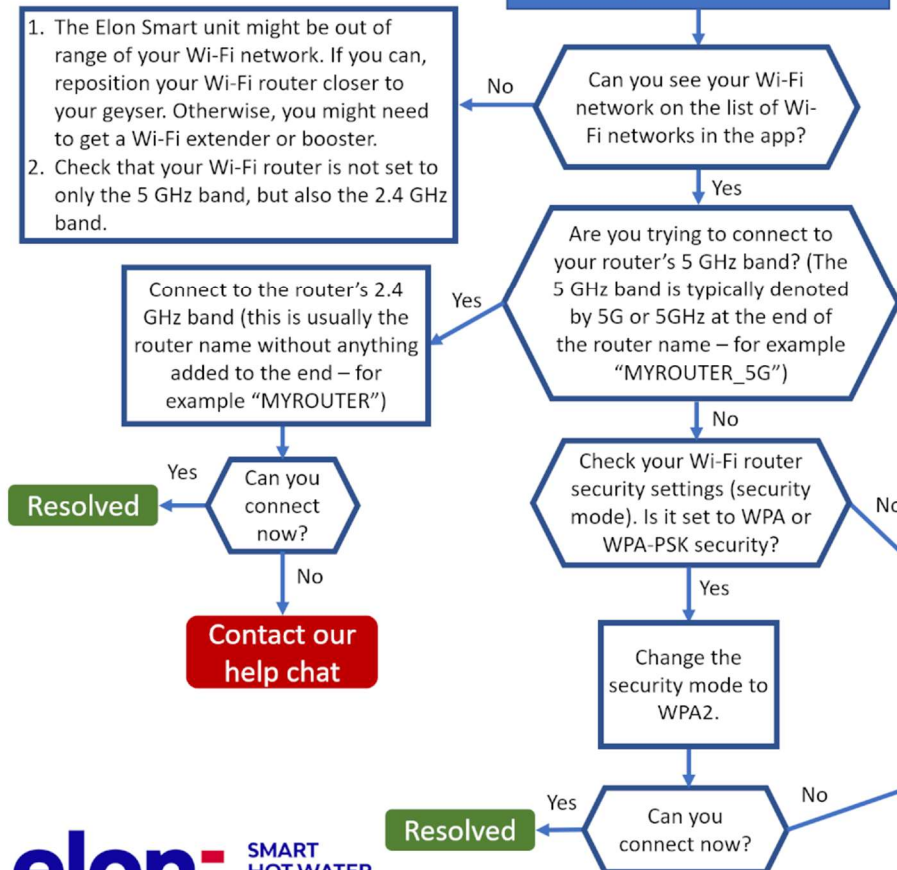
Reported Issue:



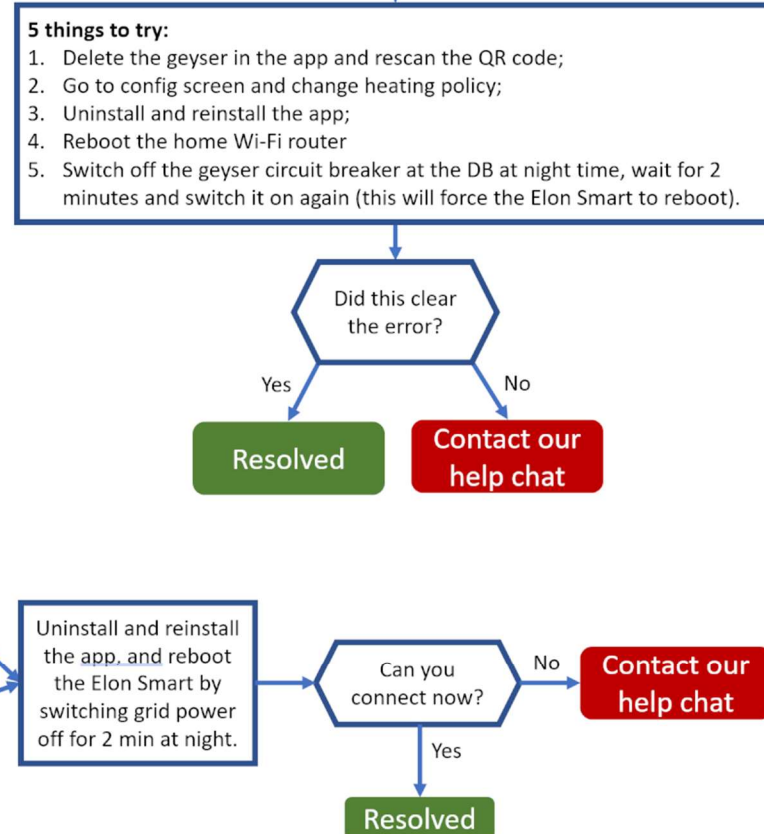
Reported Issue:

1. The Elon Smart unit might be out of range of your Wi-Fi network. If you can, reposition your Wi-Fi router closer to your geyser. Otherwise, you might need to get a Wi-Fi extender or booster.
2. Check that your Wi-Fi router is not set to only the 5 GHz band, but also the 2.4 GHz band.

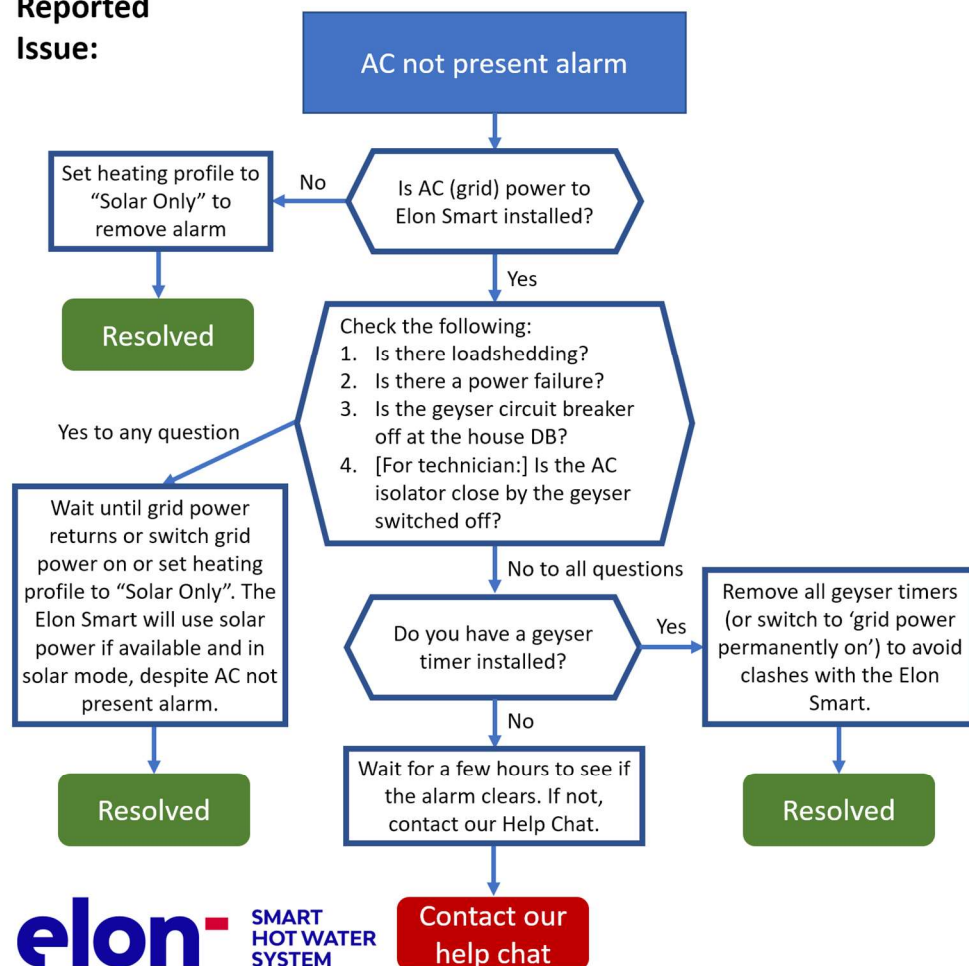
My Elon Smart won't connect to my Wi-Fi network



"Unhandled exception querying device" error



Reported Issue:



For installers: how to configure the Elon Smart when no home Wi-Fi is available

You can configure the Elon Smart by connecting directly to it as follows:

1. Scan the QR code to add the Elon Smart to the app.
2. Tap the gear icon on the home screen or select "Thermostat settings" in the menu on the status screen to access the thermostat settings.
3. Configure the thermostat as described in the installation manual (set name, address, temperature set points, heating profile). Skip the Wi-Fi configuration.

The Elon Smart will function without a Wi-Fi connection after configured, but the status screen in the app will not update.

If you want to see the status screen (graphs and temperature) update, provide a mobile Wi-Fi hotspot on a second phone (not the one that you're connecting to the Elon Smart with).