

AI-04740 HAOS Sunpower Sensors

Do I need to add all the sensors from PVS5 to my HAOS? I only have the kwh to Grid in Grid connections and Solar Panels with all inverters?

No, Rigel—you don't need to add those Lifetime Power entities to your HAOS Grid Connection if you already have the correct kWh to Grid sensor and all your solar inverters configured under Solar Panels.

However, it is important to distinguish energy imported from the grid from energy exported to the grid. The entities shown in your screenshot may represent solar production rather than household grid consumption.

1. What you currently have

Based on your description:

Solar Panels

Configured

All inverters included.

Tracks energy generated by your solar system.

Grid Connection

Configured

You have a kWh to Grid sensor.

Likely represents energy exported to the utility grid, but we should verify the sensor's meaning.

Energy imported from grid

Verify

You need a sensor that measures electricity your house draws from the utility grid.

Home Assistant treats grid imports and exports as separate energy measurements. The official documentation recommends selecting the statistic for energy consumed from the grid and, when available, the statistic for energy returned to the grid.



Home Assistant

2. What the screenshot is asking you to select

Your screenshot shows:

Configure grid connection → Energy imported from grid

The available options include:

|

Entity shown

|

What it might represent

|
| --- | --- |
|

Lifetime Power — Inverter 450051821010598

|
Lifetime energy reported by an inverter

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|
Lifetime Power — Power Meter PVS5M447519c

|
Lifetime energy from a PVS5 power meter

|
|
Lifetime Power — Power Meter PVS5M447519p

|
Lifetime energy from another PVS5 power meter

|
|
Lifetime Power — Virtual Production Meter ...pv

|
Virtual solar production measurement

|

Important

Don't select an entity merely because it says "Lifetime Power."

You need to verify what each sensor measures. An inverter's lifetime energy production is normally solar generation, not energy imported from the utility grid.

Selecting solar production as grid import would distort your Energy Dashboard.

3. Recommended configuration for your SunPower system

Your goal is to represent the actual energy flow:

SunPower Solar System

Solar panels + microinverters

Solar production (kWh)

Supplies energy to your home

Your Home

Household electricity consumption

Two-way grid connection

Grid Import

Electricity purchased from utility

Grid Export

Excess solar sent to utility

For your configuration:

|
Home Assistant setting

|
What to select

|
| --- | --- |
|

Energy imported from grid

|
A verified grid-import energy sensor

|
|
Energy exported to grid

|
Your verified kWh to Grid sensor, if it measures export

|
|
Solar panels

|
Your existing inverter energy sensors

|
|
Grid power (if available)

|
A verified instantaneous grid power sensor, if you want real-time grid flow

|
The grid power measurement is optional for the basic import/export energy setup, but can support real-time power-flow displays.



Home Assistant
+1

4. How to verify your PVS5 sensors

Before selecting any of the Lifetime Power entities, let's identify what the PVS5 is reporting.

In your existing HAOS:

1. Go to Settings → Developer Tools → States.
2. Search for:
 - PVS5M447519c
 - PVS5M447519p
 - kWh to Grid
3. Open the relevant sensor.
4. Check its Entity ID, State, Unit of Measurement, and Device Class.

Look for information that indicates:

- Grid import / consumption.
- Grid export / production.
- Solar generation.
- Inverter lifetime production.

The entity names alone are not enough to establish the direction of energy flow.

My recommendation

Don't add the four Lifetime Power entities to Energy imported from grid yet. Keep your existing inverter configuration under Solar Panels and verify what your kWh to Grid sensor measures.

Let's check your actual sensor configuration

Help me identify your grid sensors

Answer these questions based on what you see in your HAOS Energy Dashboard.

1. What does your kWh to Grid represent?

Solar energy exported to the utility

Electricity imported from the utility

I'm not sure

2. Do you have a separate grid-import sensor?

Yes, I have a grid import / consumption sensor

No, only kWh to Grid and solar sensors

I'm not sure

3. Which PVS5 entities are you considering?

Power Meter PVS5M447519c

Power Meter PVS5M447519p

Both PVS5 power meters

All four Lifetime Power entities

Continue with my configuration

If you can also send a screenshot of the Energy Dashboard → Grid Connection section showing your current kWh to Grid sensor, I can help you determine the correct setup for your PVS5.

Rigel, your screenshots clarify the situation. You already have the grid connection configured correctly for energy imported from the grid. You do NOT need to add the other Lifetime Power entities. 

Your Home Assistant Energy Dashboard is showing a coherent energy balance.

1. Your current energy dashboard

September 21 — Energy Summary

Configured

Solar Production

33.91 kWh

Grid Import

7.07 kWh

Home Consumption

40.98 kWh

Self-Sufficiency

83%

Energy balance

Your dashboard shows:

Solar

33.91 kWh

Grid

7.07 kWh

Total home energy

40.98 kWh

$33.91 + 7.07 = 40.98 \text{ kWh}$

The solar and grid values add up exactly to the home consumption shown in your screenshot.

That strongly indicates Home Assistant is currently treating the Power Meter PVS5M447519c kWh To Grid statistic as energy imported from the grid, regardless of the potentially confusing entity name.

2. Should you add the other Lifetime Power entities?

No. Leave them under Solar production.

Your second and third screenshots show multiple individual inverters, with a Solar total of 33.91 kWh.

|
Entity group

|
Your configuration

|
| --- | --- |

|
Individual inverter Lifetime Power

|
Already included in Solar production

|
|
Solar total

|
33.91 kWh

|
|
Power Meter PVS5M447519c kWh To Grid

|
Already included in Grid

|
|
Grid total

|
7.07 kWh

|
Adding the inverter Lifetime Power sensors to Energy imported from grid would incorrectly classify solar generation as electricity purchased from the utility.

3. One thing I would verify

Your sensor is named:

Power Meter PVS5M447519c kWh To Grid

The name suggests energy going to the grid (export), but your Energy Dashboard is using it as grid import.

There are two possibilities:

Possibility A — The integration's label is misleading

The sensor actually measures energy drawn from the utility. Your current dashboard configuration is consistent.

Possibility B — The sensor is truly grid export

The dashboard is assigning the wrong direction, and the grid import figure would need to be corrected.

The screenshots alone confirm the arithmetic, but not the physical direction of the PVS5 meter's measurement.

My recommendation

Keep your current setup for now. Don't add any more Lifetime Power entities.

Next, check the sensor's attributes in:

Settings → Developer Tools → States

Search for the PVS5 power meter and inspect its entity ID, unit, and attributes. That will help confirm whether kWh To Grid is really import or export.

If you share that sensor's details, I can help you verify the direction and whether you need a separate grid-export sensor.

OCR the Inverters as a table so that I can email it to Freedom Power ahead of time. I am flying to Cebu this Saturday. We know there's three defective, 2 having 0w and the other one will go to Zero when it reaches near 250W? What do you think is the issue when a panel is generating okay at 10am but at noon or 1-2pm, it stops generating?

Rigel, based on your screenshots, I can prepare an inverter serial-number table for Freedom Power and a technical summary of the three suspected defective microinverters. Since you're flying to Cebu this Saturday, I recommend sending Freedom Power the serial numbers and the temperature-related failure symptoms now, so they can prepare for troubleshooting or replacement before your visit.

1. SunPower inverter serial numbers

The following serial numbers were transcribed from your Home Assistant Energy Dashboard screenshots.

SunPower Microinverter Inventory

23 units

Source: Home Assistant Energy Dashboard · September 21, 2026

The kWh column reflects the daily values visible in your screenshots, not verified inverter nameplate ratings or a diagnostic test.

Suspected problem units

Your screenshots show two units with exceptionally low daily energy:

Serial number
Daily energy shown
Initial observation
--- --- ---

|

450051821006976

|

0.00 kWh

|

No recorded production in the screenshot

|

|

450051821009968

|

0.01 kWh

|

Nearly zero recorded production

|

The third suspected defective inverter—the one that reaches approximately 250 W and then drops to zero—cannot be identified with certainty from the daily kWh screenshot alone. Its serial number should be matched against your Solar Sentinel or Home Assistant live-power history.

Important: The two low daily totals are strong troubleshooting leads, but they are not conclusive proof of hardware failure. An inverter could have been offline, disconnected, or affected by communications issues during the day.

2. What could cause a panel to produce normally at 10 AM but stop around noon or 1–2 PM?

Your specific symptom is important:

A panel is generating normally at 10 AM, but when it reaches approximately 250 W around noon or 1–2 PM, its output drops to zero.

My leading technical hypothesis is a temperature-related microinverter shutdown or fault. However, we need to distinguish that from an electrical connection issue, a DC-side problem, or an external control/monitoring issue.

The timing and the repeatability of the failure are the clues.

Potential causes



1. Microinverter thermal shutdown

Priority investigation

Why it fits: At 10 AM, the panel and microinverter may be relatively cool. Around noon, solar irradiance and roof temperatures increase. A failing or overheating microinverter may shut down to protect itself.

What to check: Live DC input, AC output, inverter temperature if available, fault codes, and whether production resumes after cooling.

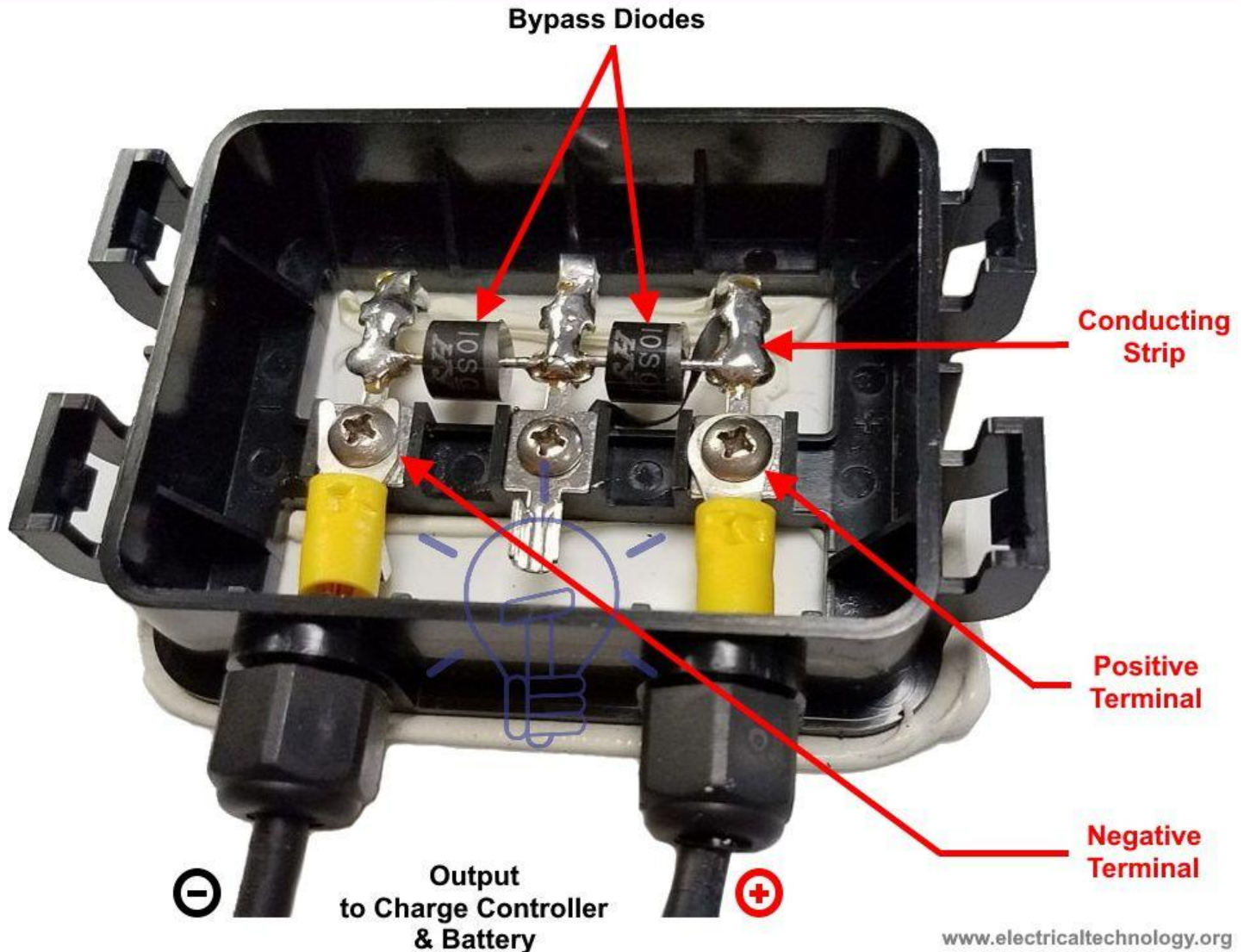


2. Loose or heat-sensitive electrical connection

A damaged MC4 connector, loose crimp, corroded contact, or wiring issue can develop a high-resistance connection. As current increases, the connection may heat up and cause intermittent operation.

What to check: MC4 connections, DC wiring, connector temperature, signs of discoloration or melting, and voltage behavior under load. Inspection and electrical testing should be performed by a qualified technician.

Solar Panle Junction Box



3. Panel junction box or bypass diode fault

A thermal or electrical defect in the module's junction box or bypass diode can cause output loss under particular operating conditions.

What to check: Panel voltage/current characteristics, thermal inspection, and module testing against a known-good panel under comparable conditions.

4. Shading or panel-specific environmental conditions

Chimneys, roof structures, trees, or changing shade can affect individual panels. However, if the output abruptly falls to zero at a repeatable power threshold, shading alone would not be my first explanation.

What to check: Whether neighboring panels experience the same timing and whether the affected panel has a distinct shade pattern.

Why the 250 W threshold matters

If the inverter repeatedly produces power, approaches approximately 250 W, and then abruptly drops to zero, that pattern is worth reproducing under controlled observation.

Possible explanations include:

- Thermal protection triggered at increased temperature or load.
- An internal microinverter component that fails as it heats up.
- An input-side voltage/current condition that causes the inverter to stop.
- A protection or grid-related event.

The 250 W value alone does not identify the fault. The exact trigger may be temperature, voltage, current, or a protection condition rather than a fixed power limit.

3. Fault isolation plan for Freedom Power

I would ask Freedom Power to perform the following checks, in this order.

Troubleshooting Checklist

For technician

1. Confirm the affected inverter serial numbers
Match the two zero/near-zero units and the third temperature-related unit against the physical panel locations and monitoring records.
2. Capture live production before the failure
Record DC input voltage/current, AC output power, and any available inverter status or fault codes at approximately 10 AM and immediately before and after the drop.
3. Check for thermal correlation
Determine whether the microinverter temperature increases before shutdown. Check whether it recovers after cooling.
4. Inspect connections and wiring
Check the module junction box, MC4 connectors, cabling, and AC connections for damage or heat-related defects. Use appropriate electrical safety procedures.
5. Compare against a neighboring healthy unit
Compare the affected panel's DC and AC behavior with a similar adjacent panel under the same sunlight conditions.
6. Test or swap components, if authorized
A qualified technician can use approved diagnostic procedures to isolate whether the fault follows the module, microinverter, or wiring. Do not disconnect or swap rooftop components yourself.

What I would specifically ask the technician

When the affected panel approaches 250 W and shuts down, does the microinverter report an overtemperature, DC input, AC grid, or other protection fault? Does the unit automatically restart after cooling, and does the fault repeat at a similar temperature or power level?

This question should help distinguish a thermal shutdown from a wiring or grid-side issue.

4. Email to Freedom Power

Here is a professional email you can send ahead of your flight.

Email

SunPower Solar System – 3 Suspected Defective Microinverters / Diagnostic Request Before September 26

SunPower Solar System – 3 Suspected Defective Microinverters / Diagnostic Request Before September 26

Dear Freedom Power Team,

I am requesting your assistance in troubleshooting my SunPower solar system in Round Rock, Texas.

I will be flying to Cebu, Philippines this Saturday, September 26, 2026, so I would like to provide the suspected inverter information ahead of time and request that you prepare for a diagnostic visit or replacement assessment if necessary.

System Information

- SunPower solar system with PVS5 monitoring.
- Approximately 23 solar panels with individual microinverters.
- Home Assistant and Solar Sentinel monitoring are being used to observe panel-level production.
- Solar system installed around 2016.

Suspected Defective Microinverters

Two microinverters have been observed with zero or nearly zero daily production in the Home Assistant Energy Dashboard:

450051821006976	0.00 kWh shown on September 21, 2026
Serial Number	Observation

There is also a third suspected defective microinverter that requires further identification:

- The panel generates normally around 10 AM.
- As production approaches approximately 250 W around noon or 1–2 PM, output drops to zero.
- I suspect this may be a temperature-related microinverter shutdown, but I would like your technician to verify the actual cause.
- The third inverter's serial number will need to be matched against the monitoring history and physical panel location.

Requested Diagnostic Checks

1. Verify the affected microinverter serial numbers and panel locations.
2. Check inverter fault codes, DC input voltage/current, and AC output behavior.
3. Investigate whether the power drop correlates with microinverter temperature or thermal protection.
4. Inspect the module junction boxes, MC4 connectors, and wiring for heat-related or intermittent connection problems.
5. Determine whether the microinverters require replacement or whether the problem originates from the solar panels, wiring, or another component.
6. Advise whether any replacement parts can be prepared or ordered in advance.

Please let me know what additional information you need from my Home Assistant / Solar Sentinel monitoring system.

Thank you for your assistance.

Best regards,

Rigel G. Arcayan

5. Before sending: one important detail

The table contains the 23 serial numbers visible in your screenshots, but the third defective inverter is not definitively identified by the daily energy totals.

I would avoid telling Freedom Power that serial 450051821006976 or 450051821009968 is necessarily the 250 W shutdown unit unless you have confirmed it in the live monitoring history.

Recommended next step

If you can open your Home Assistant Solar Sentinel panel-level monitoring and show me the three affected panels or their inverter serial numbers, I can help you prepare a final technician report with:

- Confirmed three defective inverter serial numbers.
- Failure type for each unit (0 W, near-zero output, or temperature-related shutdown).
- Approximate failure time and recovery behavior.
- A consolidated table ready to email to Freedom Power.

That would make the report more actionable for the technician before you leave for Cebu.

Rigel, based on your screenshots, I can prepare an inverter serial-number table for Freedom Power and a technical summary of the three suspected defective microinverters. Since you're flying to Cebu this Saturday, I recommend sending Freedom Power the serial numbers and the temperature-related failure symptoms now, so they can prepare for troubleshooting or replacement before your visit.

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23 units

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The kWh column reflects the daily values visible in your screenshots, not verified inverter nameplate ratings or a diagnostic test.

Suspected problem units

Your screenshots show two units with exceptionally low daily energy:

Serial number
Daily energy shown
Initial observation
--- --- ---
450051821006976
0.00 kWh

No recorded production in the screenshot

|
|

450051821009968

|

0.01 kWh

|

Nearly zero recorded production

|

The third suspected defective inverter—the one that reaches approximately 250 W and then drops to zero—cannot be identified with certainty from the daily kWh screenshot alone. Its serial number should be matched against your Solar Sentinel or Home Assistant live-power history.

Important: The two low daily totals are strong troubleshooting leads, but they are not conclusive proof of hardware failure. An inverter could have been offline, disconnected, or affected by communications issues during the day.

2. What could cause a panel to produce normally at 10 AM but stop around noon or 1–2 PM?

Your specific symptom is important:

A panel is generating normally at 10 AM, but when it reaches approximately 250 W around noon or 1–2 PM, its output drops to zero.

My leading technical hypothesis is a temperature-related microinverter shutdown or fault. However, we need to distinguish that from an electrical connection issue, a DC-side problem, or an external control/monitoring issue.

The timing and the repeatability of the failure are the clues.

Potential causes

1. Microinverter thermal shutdown

Priority investigation

Why it fits: At 10 AM, the panel and microinverter may be relatively cool. Around noon, solar irradiance and roof temperatures increase. A failing or overheating microinverter may shut down to protect itself.

What to check: Live DC input, AC output, inverter temperature if available, fault codes, and whether production resumes after cooling.

2. Loose or heat-sensitive electrical connection

A damaged MC4 connector, loose crimp, corroded contact, or wiring issue can develop a high-resistance connection. As current increases, the connection may heat up and cause intermittent operation.

What to check: MC4 connections, DC wiring, connector temperature, signs of discoloration or melting, and voltage behavior under load. Inspection and electrical testing should be performed by a qualified technician.

3. Panel junction box or bypass diode fault

A thermal or electrical defect in the module's junction box or bypass diode can cause output loss under particular operating conditions.

What to check: Panel voltage/current characteristics, thermal inspection, and module testing against a known-good panel under comparable conditions.

4. Shading or panel-specific environmental conditions

Chimneys, roof structures, trees, or changing shade can affect individual panels. However, if the output abruptly falls to zero at a repeatable power threshold, shading alone would not be my first explanation.

What to check: Whether neighboring panels experience the same timing and whether the affected panel has a distinct shade pattern.

Why the 250 W threshold matters

If the inverter repeatedly produces power, approaches approximately 250 W, and then abruptly drops to zero, that pattern is worth reproducing under controlled observation.

Possible explanations include:

- Thermal protection triggered at increased temperature or load.
- An internal microinverter component that fails as it heats up.
- An input-side voltage/current condition that causes the inverter to stop.
- A protection or grid-related event.

The 250 W value alone does not identify the fault. The exact trigger may be temperature, voltage, current, or a protection condition rather than a fixed power limit.

3. Fault isolation plan for Freedom Power

I would ask Freedom Power to perform the following checks, in this order.

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For technician

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2. Capture live production before the failure
Record DC input voltage/current, AC output power, and any available inverter status or fault codes at approximately 10 AM and immediately before and after the drop.
3. Check for thermal correlation
Determine whether the microinverter temperature increases before shutdown. Check whether it recovers after cooling.
4. Inspect connections and wiring
Check the module junction box, MC4 connectors, cabling, and AC connections for damage or heat-related defects. Use appropriate electrical safety procedures.
5. Compare against a neighboring healthy unit

Compare the affected panel's DC and AC behavior with a similar adjacent panel under the same sunlight conditions.

6. Test or swap components, if authorized

A qualified technician can use approved diagnostic procedures to isolate whether the fault follows the module, microinverter, or wiring. Do not disconnect or swap rooftop components yourself.

What I would specifically ask the technician

When the affected panel approaches 250 W and shuts down, does the microinverter report an overtemperature, DC input, AC grid, or other protection fault? Does the unit automatically restart after cooling, and does the fault repeat at a similar temperature or power level?

This question should help distinguish a thermal shutdown from a wiring or grid-side issue.

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- Home Assistant and Solar Sentinel monitoring are being used to observe panel-level production.
- Solar system installed around 2016.

Suspected Defective Microinverters

Two microinverters have been observed with zero or nearly zero daily production in the Home Assistant Energy Dashboard:

450051821006976	0.00 kWh shown on September 21, 2026
Serial Number	Observation

There is also a third suspected defective microinverter that requires further identification:

- The panel generates normally around 10 AM.
- As production approaches approximately 250 W around noon or 1–2 PM, output drops to zero.
- I suspect this may be a temperature-related microinverter shutdown, but I would like your technician to verify the actual cause.
- The third inverter's serial number will need to be matched against the monitoring history and physical panel location.

Requested Diagnostic Checks

1. Verify the affected microinverter serial numbers and panel locations.
2. Check inverter fault codes, DC input voltage/current, and AC output behavior.

3. Investigate whether the power drop correlates with microinverter temperature or thermal protection.
4. Inspect the module junction boxes, MC4 connectors, and wiring for heat-related or intermittent connection problems.
5. Determine whether the microinverters require replacement or whether the problem originates from the solar panels, wiring, or another component.
6. Advise whether any replacement parts can be prepared or ordered in advance.

Please let me know what additional information you need from my Home Assistant / Solar Sentinel monitoring system.

Thank you for your assistance.

Best regards,

Rigel G. Arcayan

5. Before sending: one important detail

The table contains the 23 serial numbers visible in your screenshots, but the third defective inverter is not definitively identified by the daily energy totals.

I would avoid telling Freedom Power that serial 450051821006976 or 450051821009968 is necessarily the 250 W shutdown unit unless you have confirmed it in the live monitoring history.

Recommended next step

If you can open your Home Assistant Solar Sentinel panel-level monitoring and show me the three affected panels or their inverter serial numbers, I can help you prepare a final technician report with:

- Confirmed three defective inverter serial numbers.
- Failure type for each unit (0 W, near-zero output, or temperature-related shutdown).
- Approximate failure time and recovery behavior.
- A consolidated table ready to email to Freedom Power.

That would make the report more actionable for the technician before you leave for Cebu.

I select a week history, 3 stands out as non-performing from the 23

Yes, Rigel. Your weekly history makes the three suspected underperforming inverters much clearer. Two are essentially non-producing, and one is producing substantially less energy than the other 20.

This gives us a better list to send to Freedom Power.

1. Three suspected defective microinverters

Based on the two screenshots you provided, the following three units stand out:

Suspected Defective Units

3 of 23

Comparison with normal units

Most other inverters shown are approximately 3.24–3.36 kWh. Unit 006967 is noticeably lower, while 006976 and 009968 are nearly zero.

Why the third unit is likely 006967

Your screenshot shows:

|
Serial

|
Energy

|
| --- | --- |
|

450051821006967

|
1.91 kWh

|
|
450051821006968

|
3.32 kWh

|
|
450051821006976

|
0 kWh

|
|
450051821006985

|
3.20 kWh

|
|
Other normal units

|
Approximately 3.24–3.36 kWh

|
|
450051821009968

|
0.09 kWh

|

The first unit is the one that stands out as partially producing but significantly underperforming. It is a reasonable candidate for your third problem, particularly if your earlier monitoring showed it reaching around 250 W and then dropping to zero.

However, the weekly energy total alone does not prove that it is the same unit. We should confirm the serial number in the panel-level power history.

2. Updated email information for Freedom Power

You can add this section to the email I drafted earlier.

Email

Updated: Three Suspected Underperforming Microinverters – SunPower SystemUpdated: Three Suspected Underperforming Microinverters – SunPower System

Updated Microinverter Findings

After reviewing a weekly energy history in Home Assistant, I identified three inverter serial numbers that stand out from the other 20 units:

450051821006976	0 kWh	Non-producing
450051821009968	0.09 kWh	Nearly non-producing
Serial Number	Weekly Energy Shown	Observation
		compared with the other inverters

Most of the remaining microinverters are producing approximately 3.24–3.36 kWh in the displayed history.

The third suspected unit (450051821006967) may correspond to the panel that generates normally in the morning but drops to zero when output approaches approximately 250 W around noon or 1–2 PM. This correlation still needs to be confirmed through panel-level monitoring and technician testing.

Please prioritize inspection of these three units and check for:

- Microinverter thermal shutdown or fault codes.
- DC input and AC output behavior.
- Electrical connection and wiring issues.
- Whether replacement microinverters are required.

Please let me know if you need the complete inverter inventory or additional monitoring records before scheduling service.

3. What does the third unit's lower energy tell us?

Your observation that the panel works at 10 AM, reaches approximately 250 W, and then stops is more informative than the weekly energy total.

If 450051821006967 is the unit exhibiting that behavior, the energy history is consistent with intermittent production rather than a complete failure.

The key distinction:

Units 006976 and 009968

Near-zero production in the displayed period. These need investigation for loss of production, disconnection, failed microinverter, or other causes.

Unit 006967

Partial energy production. If the morning-to-noon shutdown is repeatable, a temperature-related or load-related intermittent fault is worth investigating.

My technical assessment

I would ask Freedom Power to investigate thermal-related microinverter shutdown as a priority hypothesis for unit 006967, but I would not label it a confirmed thermal failure until the technician checks fault logs, temperature, and electrical measurements. A microinverter can stop operating due to protection conditions, and the timing you described makes temperature worth testing. Other causes, including DC connection issues and AC-side faults, remain possible.

4. The most useful evidence before you fly

If you have time before Saturday, the single most valuable thing to capture is a live power history for unit 006967 on a sunny day.

Try to capture:

- |
- Time
- |
- What to record
- |
- | --- | --- |
- |
- 9:30–10:00 AM
- |
- Power output while operating normally
- |
- |
- 11:30 AM–12:30 PM
- |
- Power approaching the suspected threshold
- |
- |
- 12:00–2:00 PM
- |
- Exact time output drops to zero
- |
- |
- After shutdown
- |
- Whether output returns later in the afternoon

|
|

All times

|
Any inverter fault status or error code

|

If you can identify the precise failure time and whether the unit restarts after cooling, that will help Freedom Power distinguish an intermittent fault from a persistent failure.

Bottom line: Your three suspected serial numbers are now 006976, 009968, and 006967 based on the weekly history. Send the first two as confirmed non-producing/near-zero leads, and identify 006967 as the suspected intermittent underperformer pending confirmation of the 250 W shutdown behavior.

Yes, the 6967 is the one that performs good and then when all is well in terms of sunlight, it cuts off. There is a sensor triggering the inverter for safety which relates to temp or power.

That clarification strengthens the diagnosis, Rigel. If inverter 450051821006967 produces normally in the morning, then shuts down when sunlight and panel output are still good, a temperature-triggered protection event is a credible leading hypothesis. It is not yet confirmed to be the temperature sensor itself.

The important distinction is that the inverter may be detecting an unsafe operating condition and shutting itself down, rather than the panel failing to produce sunlight.

What may be happening inside 006967

Suspected thermal shutdown sequence

1. Morning — Normal operation

The panel and microinverter are relatively cool. The inverter generates power normally.

2. Late morning — Increased irradiance and heat

Solar production increases, and the microinverter mounted beneath the panel may become hotter.

3. Noon / early afternoon — Protection threshold

A temperature sensor or other internal protection mechanism may detect an unsafe condition. The inverter reduces output or disconnects.

4. After shutdown — Recovery or continued fault

Depending on the protection design, the inverter may automatically restart after conditions return to normal, or remain offline until a reset or service intervention.

Microinverters mounted behind PV panels can experience significant heat exposure. Research has found that microinverter placement affects thermal conditions and efficiency. However, this does not establish that your particular unit is overheating or that its protection threshold is set at 250 W.

E

ScienceDirect

1. Is there a safety sensor that triggers the shutdown?

Yes, microinverters can incorporate internal protection mechanisms, including thermal protection. The exact sensor and trigger logic depend on the manufacturer and model.

Possible protection mechanisms to investigate:

|
Protection mechanism

|
What it may detect

|
| --- | --- |
|
Internal temperature sensor

|
Excessive internal component or heatsink temperature

|
|
DC input protection

|
Abnormal DC voltage or current

|
|
AC grid protection

|
Abnormal voltage, frequency, or grid conditions

|
|
Internal fault protection

|
Component malfunction or control fault

|
For your unit, we need the exact microinverter model and its technical documentation to identify the actual protection system. General SunPower documentation for newer AC modules lists microinverter operating temperature specifications, but it does not prove the specifications or fault thresholds of your 2016-installed unit.



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+1

2. The 250 W threshold: what I would investigate

You mentioned that the unit reaches approximately 250 W and then drops to zero.

I would ask Freedom Power to check whether:

- The shutdown occurs at approximately the same internal temperature each time.
- The 250 W value is an actual measured AC output limit or simply the power level reached before a temperature-related trip.
- The inverter generates an error or protection status in the PVS5.
- The output recovers automatically after the unit cools.
- A neighboring microinverter operating under similar conditions shows the same behavior.

The key diagnostic is whether the shutdown correlates with temperature rather than power alone. A fixed 250 W trigger could suggest a power or electrical limit, but the number by itself is insufficient to identify the cause.

3. Updated message for Freedom Power

You can add this more precise description to your email:

Email

Additional Technical Symptom – Microinverter 450051821006967Additional Technical Symptom – Microinverter 450051821006967

Additional Symptom: Intermittent Shutdown Under High Solar Production

I can confirm that microinverter **450051821006967** is the unit that performs normally in the morning but shuts down later in the day when sunlight conditions remain good.

Observed behavior:

- Normal production around 10 AM.
- Output increases as sunlight improves.
- At approximately 250 W, the inverter appears to shut down and output drops to zero.
- The failure occurs around noon to 1–2 PM, when solar irradiance and equipment temperatures are higher.

My working hypothesis is that an internal temperature-related protection mechanism may be triggering a shutdown. I would like your technician to verify this by checking the inverter's fault logs, internal temperature readings (if available), and DC/AC electrical behavior immediately before and after the event.

Please determine whether this is a thermal protection event, an electrical connection issue, a DC-side fault, or another microinverter failure.

Thank you.

My recommendation before your flight

Send Freedom Power the three serial numbers, with 006967 specifically identified as the intermittent shutdown unit.

If you can capture one more event in Solar Sentinel before Saturday, the most useful evidence would be a screenshot showing:

1. The unit's live power output rising.
2. The drop from approximately 250 W to zero.
3. Any available inverter status or fault code at the same time.

That would give the technician a much stronger starting point than the daily kWh history alone.

Dear Freedom Power Team,

I am requesting your assistance in troubleshooting my SunPower solar system in Round Rock, Texas.

I will be flying to Cebu, Philippines this Saturday, September 26, 2026, so I would like to provide the suspected inverter information ahead of time and request that you prepare for a diagnostic visit or replacement assessment if necessary.

System Information

- SunPower solar system with PVS5 monitoring.
- Approximately 23 solar panels with individual microinverters.
- Home Assistant and Solar Sentinel monitoring are being used to observe panel-level production.
- Solar system installed around 2016.

Suspected Defective Microinverters

Two microinverters have been observed with zero or nearly zero daily production in the Home Assistant Energy Dashboard:

450051821006976	0.00 kWh shown on September 21, 2026
450051821009968	0.01 kWh shown on September 21, 2026
Serial Number	Observation
-----	-----
	inverters

There is also a third suspected defective microinverter that requires further identification:

- The panel generates normally around 10 AM.
- As production approaches approximately 250 W around noon or 1–2 PM, output drops to zero.
- I suspect this may be a temperature-related microinverter shutdown, but I would like your technician to verify the actual cause.
- The third inverter's serial number will need to be matched against the monitoring history and physical panel location.

Requested Diagnostic Checks

1. Verify the affected microinverter serial numbers and panel locations.
2. Check inverter fault codes, DC input voltage/current, and AC output behavior.
3. Investigate whether the power drop correlates with microinverter temperature or thermal protection.
4. Inspect the module junction boxes, MC4 connectors, and wiring for heat-related or intermittent connection problems.
5. Determine whether the microinverters require replacement or whether the problem originates from the solar panels, wiring, or another component.
6. Advise whether any replacement parts can be prepared or ordered in advance.

Please let me know what additional information you need from my Home Assistant / Solar Sentinel monitoring system.

Thank you for your assistance.

Best regards,

Rigel G. Arcayan

Inverter Production Report

23 Inverters

Solar total displayed

67.7 kWh

Period: 7-day history selected in Home Assistant (as shown in the supplied screenshots).

#	Inverter serial number	Energy	Status
1	450051821006967	1.91 kWh	Suspected intermittent
2	450051821006968	3.32 kWh	Normal range
3	450051821006976	0.00 kWh	No production
4	450051821006985	3.20 kWh	Normal range
5	450051821006987	3.36 kWh	Normal range
6	450051821007008	3.33 kWh	Normal range
7	450051821007073	3.29 kWh	Normal range
8	450051821007306	3.25 kWh	Normal range
9	450051821007621	3.28 kWh	Normal range
10	450051821009236	3.28 kWh	Normal range
11	450051821009237	3.32 kWh	Normal range
12	450051821009924	3.24 kWh	Normal range
13	450051821009968	0.09 kWh	Near-zero
14	450051821009971	3.26 kWh	Normal range
15	450051821009973	3.29 kWh	Normal range
16	450051821009975	3.29 kWh	Normal range
17	450051821010130	3.28 kWh	Normal range
18	450051821010146	3.34 kWh	Normal range
19	450051821010204	3.27 kWh	Normal range
20	450051821010230	3.26 kWh	Normal range
21	450051821010231	3.31 kWh	Normal range
22	450051821010232	3.28 kWh	Normal range
23	450051821010598	3.25 kWh	Normal range