Solar Pump Not Starting

Causes, Fixes & Troubleshooting Guide

Pumps Africa Technical Support PDF

Solar Pump Not Starting? Here’s What You Need to Know

Solar pumps are designed to operate reliably with minimal maintenance. However, when a solar pump suddenly refuses to start, the problem can quickly become frustrating — especially when water supply depends entirely on the system.

In many cases, the issue is not the pump itself. Instead, the fault may involve:

- Solar panels
- Controllers
- Low voltage
- Dry-run protection
- Electrical connections
- System configuration

Fortunately, most solar pump problems can be diagnosed systematically without replacing the entire installation.

This guide explains:

- Why a solar pump may not start
- Common solar pump faults
- How to troubleshoot the system safely
- Possible repair solutions
- When to contact a solar pump specialist

Whether you use a solar borehole pump, irrigation pump, livestock watering system, or off-grid water solution, these troubleshooting steps can help identify the issue quickly.

Because solar systems are wonderfully reliable… right up until one small connector decides it no longer believes in electricity.

Common Signs Your Solar Pump Has a Starting Problem

Your solar pump may:

- Fail to switch on

- Show controller alarms
- Produce no water flow
- Start intermittently
- Trip protection systems
- Shut down unexpectedly
- Display low voltage warnings
- Run briefly and stop again

Additionally, some systems may appear completely dead even though sunlight conditions seem normal.

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1. Insufficient Solar Power

One of the most common reasons a solar pump does not start is insufficient solar input.

Solar pumps require adequate sunlight and voltage before the controller allows the system to operate.

However, reduced solar production can occur due to:

- Cloudy weather
- Dirty panels
- Shading
- Damaged panels
- Poor panel orientation

Common Symptoms

- Pump starts late in the morning
- System works intermittently
- Controller displays low voltage warnings
- Pump stops during cloudy conditions

Solution

- Clean solar panels
- Check for shading
- Inspect panel wiring
- Verify panel voltage output

Even partial shading on one panel can reduce system performance significantly.

Solar panels are surprisingly dramatic about shadows. One nearby branch suddenly turns the entire system into a philosophical discussion about energy.

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2. Faulty Solar Pump Controller

The controller is the brain of the solar pumping system.

If the controller fails, the pump may:

- Refuse to start
- Shut down unexpectedly
- Display fault codes
- Operate intermittently

Common Causes

- Power surges
- Water ingress
- Incorrect settings
- Overheating
- Lightning damage

Solution

- Check controller display messages
- Reset the controller
- Verify voltage settings
- Inspect for visible damage

If fault codes appear, consult the controller manual or contact a solar pump technician.

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3. Dry-Run Protection Activated

Most modern solar pumps include dry-run protection to prevent damage when water levels drop too low.

If the borehole or water source cannot supply enough water:

- The controller shuts down the pump
- Startup may be delayed
- The system may cycle repeatedly

Common Causes

- Low borehole water levels
- Seasonal drought conditions
- Excessive pumping demand
- Poor borehole recovery rate

Solution

- Check water levels
- Reduce pumping demand
- Allow borehole recovery time
- Verify dry-run sensor settings

Dry-run protection prevents expensive pump damage and should never be bypassed carelessly.

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4. Loose or Damaged Wiring

Electrical connection problems are extremely common in outdoor solar installations.

Over time:

- Connectors loosen
- Terminals corrode
- Cables become damaged
- Moisture affects connections

As a result, the system may lose power intermittently.

Common Symptoms

- Intermittent startup
- Controller restarting
- Voltage fluctuations
- Burnt connector smell

Solution

- Inspect all wiring connections
- Tighten loose terminals
- Replace damaged connectors
- Check for corrosion

Outdoor environments are not particularly gentle on electrical systems. Sun, moisture, dust, and insects all join the engineering group project eventually.

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5. Low Voltage from Solar Panels

If panel voltage drops below the controller’s startup threshold, the pump will not start.

This may happen due to:

- Undersized solar arrays
- Damaged panels
- Poor weather conditions
- Incorrect system design

Solution

- Measure solar array voltage

- Compare readings to system specifications
- Inspect panels for damage
- Verify proper array sizing

Undersized systems commonly struggle during winter or cloudy conditions.

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6. Pump Motor Failure

Although less common, the pump motor itself may fail due to:

- Overheating
- Dry running
- Worn bearings
- Electrical damage
- Water ingress

Common Symptoms

- No motor response
- Tripping protection systems
- Burnt smell
- Loud humming noise

Solution

- Test motor resistance
- Inspect insulation condition
- Replace damaged motor if necessary

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7. Faulty Float Switch or Water Level Sensor

Some solar pumping systems use:

- Float switches
- Level probes
- Tank sensors

To control operation automatically.

If these sensors fail, the controller may prevent the pump from starting.

Solution

- Inspect float switches
- Check sensor wiring
- Verify controller inputs

- Replace faulty sensors

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8. Incorrect Controller Settings

Incorrect programming can also prevent startup.

This commonly occurs after:

- Power interruptions
- System upgrades
- Incorrect setup
- Parameter resets

Solution

Verify:

- Startup voltage settings
- Dry-run protection settings
- Operating schedules
- Pressure settings

How to Troubleshoot a Solar Pump That Won’t Start

Step 1 – Check Solar Panel Output

Inspect:

- Sunlight conditions
- Panel cleanliness
- Voltage readings
- Shading problems

Step 2 – Inspect the Controller

Check for:

- Alarm codes
- Fault lights
- Low voltage warnings
- Overheating

Step 3 – Verify Water Supply

Ensure:

- Adequate borehole water levels
- No dry-run conditions
- Stable water supply

Step 4 – Inspect Electrical Connections

Check:

- Terminals
- Connectors
- Cable damage
- Corrosion

Step 5 – Test the Pump Motor

Verify:

- Motor resistance
- Insulation condition
- Startup operation

Can a Solar Pump Be Damaged by Repeated Starting Failures?

Yes.

If startup problems continue:

- Controllers may overheat
- Motors can become damaged
- Dry running may occur
- Electrical components may fail

Therefore, recurring faults should always be investigated promptly.

When to Contact a Solar Pump Specialist

You should contact a technician if:

- The controller displays repeated faults
- The motor overheats
- The system starts intermittently
- Voltage remains unstable
- Dry-run shutdowns continue
- The pump still does not start after troubleshooting

Solar Pump Troubleshooting & Repairs in South Africa

At Pumps Africa, we assist customers across South Africa with:

- Solar pump troubleshooting
- Solar borehole pump repairs
- Controller fault diagnosis
- Irrigation system support
- Dry-run protection problems
- Solar water pumping systems
- Off-grid water solutions

We supply:

- Solar borehole pumps
- Solar irrigation pumps
- Pump controllers
- Borehole pumping systems
- Pressure systems
- Water storage solutions

Related Pump Troubleshooting Guides

You may also find these guides useful:

- Pump Humming But Not Starting
- Pump Overheating
- Pump Losing Prime
- Borehole Pump Running Dry
- Low Water Pressure Problems
- Pump Vibrating Excessively

Need Help With a Solar Pump That Won’t Start?

If your solar pump is not starting or producing water, contact Pumps Africa for expert troubleshooting support and solar pump repair assistance across South Africa.

Our technical team can help diagnose:

- Controller faults
- Low voltage problems
- Solar panel issues
- Dry-run protection faults
- Electrical failures
- Pump motor damage

Website: https://pumpsafrica.co.za

Because solar pumps always seem to stop working at the exact moment somebody confidently says: “At least the solar system doesn’t rely on Eskom.”