

WARRANTY REGISTRATION FORM

Name

Address

Phone Number

Purchased From

Date of Purchase

Pump Model

Pump Serial Number

Controller Model

Controller Serial Number

System Power

PV-Direct

Battery System

If PV:

Number of Panels

Solar Panel Brand

Solar Panel Wattage

Watts

Operating Voltage

V

Well Depth

ft

Casing Diameter

inches

Static Water Level

ft

Pump Set Depth

ft

Lift above ground level

ft

Discharge Pressure, In Any

PSI

WARNINGS

Please review the following warnings. These are listed for both personal safety and the safety of the products. Disregarding or ignoring these warnings can result in **SERIOUS INJURY** and/or **VOID YOUR WARRANTY**. All SunRotor® Solar Pumps should be installed by a licensed pump installer. If this system is being installed without a licensed pump installer, an electrician or knowledge of electrical circuits is **HIGHLY** recommended. If any questions or concerns regarding these warnings should arise, please contact your Authorized SunRotor® Dealer or the SunRotor® Technical Services Team at 1-580-303-4015. Solar Power & Pump Company, LLC is **NOT LIABLE** for any **DAMAGE** or **INJURY**.

- All SunRotor® controllers have a maximum voltage rating. Exceeding these ratings will destroy the controller and void the warranty. Do **NOT** exceed the following open circuit voltages: [SRC-M50T](#): 50VDC; [SRC-M100T](#): 100VDC; [SRC-M200T](#): 200VDC. For all other controllers, please contact the SunRotor® Technical Services Team
- The system should be installed and serviced by qualified personnel only. All electrical codes should be observed. Make **ABSOLUTELY CERTAIN** all power sources are disconnected prior to wiring.
- Extreme heat can damage the pump. Protect the pump from sunlight or other heat sources.
- SunRotor® solar pumps are **CLEAN WATER PUMPS**. Extreme sand or silt may cause the pump to stop or fill the pipe with debris. Running it under these conditions may damage the pump and **VOID YOUR WARRANTY**. Do **NOT** use the pump to develop a new well or purge a dirty well.
- Install proper system grounding for safety and lightning protection. Although the warranty does **NOT** cover damage caused by *ACTS OF GOD*, proper grounding can significantly reduce the chance of extreme damage.
- Follow all wire sizing recommendations on pump data sheets. Under-sizing the wires can cause the pump to experience low power failure.
- Do not touch controller input or pump wires together to test for a spark.
- Do not run the pump dry.
- The cable splice must make a water-tight seal to the **OUTER JACKET** of the pump cable.
- There are potential hazards in handling any heavy mechanical assembly. If you have any doubts about your ability to perform the Hand Installation **SAFELY**, please hire a professional pump installer. Do not use a winch or a vehicle.
- Do not run the pump against a blocked or restricted outlet.
- Please pay close attention to the following symbols throughout this guide:



CAUTION: disregarding may result in damage to equipment and **VOIDING OF WARRANTY**



WARNING: disregarding may result in **SERIOUS INJURY OR DEATH**

INDICATOR LIGHTS

The indicator lights located on the upper half of the controller display the status of the pumping system. Below is an explanation of each indicator light and its function.

SYS (*Solid Green*): This indicator light will illuminate whenever the switch is in the *on* position and the power is available to the controller.

Pump (*Solid Green*): This indicates that power is being applied to the pump. This indicator will illuminate 20-30 seconds after the system has been switched on as long as there is adequate power available and all water level sensors are reading normal.

MPPT (*Flashing Green*): The MPPT (Maximum Power Point Tracking) monitors the power input from the solar panels and adjusts the voltage and current to gain the highest performance of the pump. This indicator light will flash green when the MPPT is working properly.

ERR_1 (*Solid Red*): This light will usually illuminate when there is an overcurrent issue. If the pump is drawing too high of an amperage, the overcurrent protection will engage to protect the pump, motor, and controller. The pump will be shut down until the system is reset. It should automatically start after 20 minutes. If not, cycle the power switch and verify the **ERR-1** light has turned off. If it repeats, call Technical Support. Overcurrent can be caused by pump or motor problems, shorts in the wiring, or even a blockage in the piping. Please consult your Authorized SunRotor® Dealer for technical support, or contact SunRotor® Technical Services Team directly at 1(866) 246-7652.

LOW POWER (*Solid Orange*): This indicator light will illuminate when there is not enough power to operate the pump or when the pump motor cannot start because of blockage, torn stator, or other factors. Low sunlight or hazy conditions are usually the cause.

Tank_F (*Solid Red*): This light indicates the storage tank is full. When water in the tank reaches its desired level, the float switch rises and closes the circuit. The pump will shut down until the water level decreases and the remote switch returns back to the open position.

Well_L (*Solid or flashing Red*): This indicator light is illuminated when the water level in the water source has dropped below the sensor. When the low water sensor is tripped, the pump is shut down, and the timer will start as long if it has been set above zero (red light flashes when timing). The pump will restart when this time expires. The time is adjustable between 0 and 30 minutes.

POST-INSTALLATION TESTING

The following tests are recommended after completing the installation.

To test the low water sensor, disconnect one wire to open the circuit. Since it is a normally closed switch, removing one end of the sensor cable or jumper will trigger the circuit logic to turn off the pump. To test the timer function, set the timer to a low setting: somewhere between 0 and 5 (around 2 ½ minutes). Disconnect the cable and wait for the pump to turn off. After the pump stops, reconnect the cable. The pump should automatically turn back on after the specified time has passed.

Most tank full float switches are normally open. To test it, jumper between the two tank full terminals. This will create a closed circuit, and the pump should turn off. Once the jumper is removed, the pump will restart.

If these tests do not produce the same results, see the *Troubleshooting Section*. Please contact your Authorized SunRotor® Dealer or the SunRotor® Technical Service Team directly at 1(866) 246-7652 if any further information is needed.

TROUBLESHOOTING

IF THE PUMP DOESN'T RUN

Most problems are caused by incorrect connections (in a new installation) or bad splices on the pump cable or low water sensor. The **SYSTEM** light will indicate that the system is switched on. It indicates that **VOLTAGE** is present, but there may not be sufficient power to start the pump.

System appears dead, no lights showing on the controller:

1. Is there a disconnect switch or circuit breaker installed on the solar array circuit? Is it off?
2. Look for disconnected or damaged wires.
3. Is there any dust or debris on your solar array?

Pump attempts to start every 60-90 seconds but doesn't run:

1. There may be insufficient power reaching the controller. A solar-direct system should start if there is enough sun to cast a slight shadow.
2. If the pump was recently connected (or reconnected) to the controller, it may be running in the opposite direction due to a wiring error.
3. The pump or pipe may be packed with mud, sediment, or debris.
4. Helical rotor models: The rubber stator may be expanded from heat, due to sun exposure or pump water that is warmer than 100°F (38°C). This may stop the pump temporarily, but will not cause damage.

INSPECT THE SYSTEM

Many problems can be located by a simple inspection. No electrical experience is required for this.

Inspect the Solar Array

1. Is it facing the sun?
2. Is there a partial shadow on the array? If only 10% of the array is shadowed, it can potentially stop the pump.

Inspect All Wires and Connections

1. Look carefully for improper wiring (especially in a new installation).
2. Make a visual inspection of the condition of the wires and connections. Wires are often chewed by animals if they are not enclosed in conduit or buried.

Inspect the Controller

1. Open the clear hinged door to have an unobstructed view of the terminal strip and circuit board.
2. First, check for a burnt smell. This will indicate a failure of the electronics. Look for burnt wires, bits of black debris, and any other signs of lightning or other electrical damage.

3. Inspect the grounding wires and connections. Most controller failures are caused by an induced surge from nearby lightning where the system is NOT effectively grounded. Grounded connections must be properly made, tight, and free of corrosion

Check the Low Water Sensor

If the controller indicates **LOW WATER** (**Well_L** indicator light is solid red) when the pump is in the water, inspect the low-water sensor. The sensor should have been mounted on the drop pipe above the pump. If inspection is not feasible, bypass the sensor or test it electronically.

1. If the sensor is NOT being used, there must be a wire used to jumper the **COM1** and **WH** terminals.
2. The sensor must be mounted vertically (within about 10°).
3. The sensor or its wires may be broken. Inspect the wires for damage.
4. If the pump can run when the sensor is **OUT** of the water, the float in the sensor is stuck. In surface water, this can happen from algae, small insects or snails, or other debris.

Check the Tank-Full Float

If the **Tank_F** indicator light is red when the storage tank is not full, the float switch may be damaged. Inspect the tank full float switch. It should be mounted to the side of the storage tank unless a tethered float switch is used, in which case you can find it by following the float switch cable down to the weight. If inspection is not feasible, bypass the switch or test it electronically.

ELECTRICAL TESTING

There are several tests that can be performed with a multimeter to determine why the solar water pumping system has failed. *Figure 10-1 Electrical Testing* will provide you with what settings and terminals to check. Reference the corresponding images for clarification.

Probe input: Some meters give a choice of probe sockets. The black negative (-) probe **ALWAYS** goes in the “COM” (common) socket. The red positive (+) probe varies, and is specified below on each of the tests.

10-1 ELECTRICAL TESTING

Test/Photo Number	Test Description	Notes	Meter Setting	Probe Input +	Interpretation
1A	PV (solar) array open-circuit voltage	Switch the controller to the OFF position	DC volts	V ...	Reading should reflect the VOC value on the panel label
1B	DC input voltage during pumping	Switch the controller to The ON position	DC volts	V ...	Indicates proper controller input function
2A	Pump AC voltage during pumping	Read any two of the pump cable wires (1, 2, 3)	AC volts	V ...	Voltage determines speed, and assures that the motor is spinning
2B	Pump circuit resistance	Power OFF Measure ALL 3 pump wires (1-2 / 1-3 / 2-3)	Ohms Ω	Ω ...	Normal (0.6 – 1.4) and equal means the motor, cable, and splices are all good
3	Motor AC current draw	Measure any one of the three pump cable wires	AC amps	AMPS 1A or higher	Current is proportional to the torque load on the motor
4	Resistance between float switch wires	Check both open and closed circuit resistances	Ohms Ω	Ω ...	If there is any resistance other than 0 or ∞, your Tank Full may trip, causing unwanted stopping of pump

TROUBLESHOOTING CHECKLIST

The following items may be causing the solar water pumping system to have less than expected flow rate or pump failure. Be sure to go through the list before contacting your Authorized SunRotor® Dealer or calling the SunRotor® Technical Services Team.

1. Is the solar array receiving shadow-free light? It only takes a small shadow to reduce efficiency. Is the solar array oriented properly toward the south, and tilted at the proper angle?
2. Has any additional lift or pressure requirements been added or changed? The system was sized based on specific information provided; if this is changed, there may be a reduction in flow rate.
3. Are the wires and pipes undersized? If the pump wires and pipe were not adequately sized for the distances used, the flow rate may not be consistent due to loss in current and/or friction loss.
4. Inspect and test the solar array input and controller output. Are the values lower than what the system is rated for? This may be caused by a short in the wire, bad connection or improperly configured wiring.
5. Are there any leaks in the pipe from the pump? There should be little or no leakage over a period of hours.
6. Has the pump's speed control setting been moved lower than the maximum? The speed control can slow the pump down to 30% of maximum power, and may be causing lower than expected flow rates if moved.
7. Look in the water tank or pipes:
 - a. Is the AC motor current lower than normal? The rotor and/or stator may have been worn from too much abrasive materials or particles (sand or clay) in the water. See the *Maintenance Section* for more details on how to change the rotor/stator.
 - b. Is the AC motor current higher than normal? Does it have trouble starting in low light? This is likely related to a blockage in the pump and/or pipe.
 - c. Is there sediment accumulating in the pipes or tank? Additional accessories may be needed to keep from damaging the system

Additionally, age may be a factor. After many years of use, it may be necessary to have the motor rebuilt or replace the pump end. For more information and services provided, please contact the SunRotor® Technical Services Team.

MAINTENANCE

One of the defining features of the SunRotor® solar pump product line is its ability to be repaired at a fraction of the cost of buying a new replacement. A little care and attention can extend the life of the system drastically and save money in the long run.



WARNING: The power should be turned OFF, as well as the pump wires removed, prior to performing any maintenance on the pump or other equipment. Disregarding this warning may lead to DEATH or SERIOUS INJURY. Follow any and all local, state, and federal electrical standards and procedures and use caution.

HELICAL ROTOR PUMP END MAINTENANCE

The helical rotor pump line offers one of the easiest procedures for maintaining water demands. In locations where abrasive minerals or sediments reside in the water source, both the rotor and stator can eventually wear down, which in turn decreases the flow rate of the system. To replace these parts, the pump will first need to be pulled from the well. Before starting any service, please turn off the controller and disconnect the pump wires to prevent any high voltage current from causing injury or death.

After the pump has been pulled from the well, begin dismantling the pump end. First, take off the filter screen by removing the screws holding it secure to the pump. Next, remove the three (four on some models) bolts holding the cast pump end in place. Once removed, access to the stator will be available. Pull the worn stator from the rotor. Inspect the rotor for damage. If the rotor is undamaged push a new stator on and replace the pumps end.

If the rotor is damaged, remove the three (four) bolts from the motor and remove the pump housing. Remove the setscrews in the motor coupler (rubber piece) and unscrew the rotor from the motor shaft (counter threaded, turn clockwise to remove). Install the new rotor and replace the setscrews in both ends of the rubber coupling. Re-attach the pump housing, install the stator and then the pump end. Finish with reinstalling the filter screen. In most circumstances, this will be all that is necessary to regain the original flow rates. Set the pump back as it was in the initial installation. Once everything is back in place, turn the pump on and observe the flow rate. There should be an observable increase if the worn rotor/stator was the only underlying fault in the system.

CENTRIFUGAL PUMP END MAINTENANCE

Centrifugal pump ends currently do not offer the same convenience of field repair as the helical rotor pump ends. Contact your Authorized SunRotor® Dealer or the SunRotor® Technical Services Team for more information.

PUMP MOTOR REPAIR

All of the SunRotor® solar pumps—with the exception of the SR-26—have repairable pump motors. Winding damage on the motor is currently unrepairable. If the pump motor is found to be the cause of the system failure, contact the SunRotor® Technical Services Team for available rebuild options.

SOLAR PANEL MAINTENANCE

Depending on the region the system is installed, a few key procedures will help in maintaining the required water demand. Many solar pump installations will be located in fields and other rural areas, prone to the elements and dirt blown by the wind. If accessible, wipe or hose down the solar panel array occasionally to prevent dust and debris build-up on the solar array. This will ensure the system is being provided with all of the available power produced by the panels.

MISCELLANEOUS

Debris, livestock, insects, and other creatures can cause the system to run at less than optimal speeds. When available, check wires, cables, pipes, and hose for damage caused by any number of environmental circumstances. A few minutes to give the system a once-over can extend the life of the solar water pumping system.

REPAIRS AND REPLACEMENTS

In the event that the pump needs to be repaired and/or replaced, contact the SunRotor® Technical Services Team at 1(866) 246-7652 or 1(580) 303-4015. You will be provided with an RMA number.



ATTENTION: DO NOT send any equipment back to SunRotor® Solar Products without an RMA. Your equipment may be lost or mishandled without the proper identification.

Detailed instructions will be provided upon contact. If required to send the pump back for repair or replacement, please cut the pump cable above the splice (on the controller side). Including the splice helps to determine the cause of the pump failure.

In the case of controller failure, return only the circuit board, not the enclosure. Remove the four (4) screws holding the aluminum backplate to the enclosure. Return only the circuit board and backplate.

For all other parts and accessories, contact the SunRotor® Technical Services Team.