ECO SPARK
SOLAR POOL HEATING

HOMEOWNERS MANUAL FOR SOLAR POOL HEATING

UMA SOLAR
a Magen eco-Energy Company

When working on or around your roof or pool, please take care to avoid hazards such as electrical wires and loose shingles. If you have any product or installation questions, contact your eco-SPARK representative.

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Thank you for your recent purchase of a eco-SPARK Solar Pool Heating System from UMA Solar.

This Homeowners Manual will go over the basic operations of your system, system shutdown/opening, maintenance and troubleshooting. If you have any issues with your system please contact your installer or contact us directly at: 800.79.SOLAR

BASIC OPERATION OVERVIEW

OPERATIONAL CONCEPT

Pool water is circulated through the solar pool heating collectors using your existing pool pump (or solar booster pump, if one exists). As water moves through the solar pool heating collectors it is heated by sun before returning to the pool. Upon system startup air will purge from the solar pool heating collectors and out through the pool return jets. This is normal operation and bubbles will usually stop within 1-3 minutes after initial startup.

CONTROLS

Unless the system is manual in design it is controlled using an electronic differential controller. The differential controller measures the temperature difference between the pool water and the roof where the solar pool heating collectors are located using two temperature sensors. When the temperature on the roof reaches a certain threshold above the temperature of the pool water a motorized diverter valve is triggered and diverts water to the solar pool heating collectors. When the desired pool temperature has been reached, or sufficient solar radiation is no longer available, the diverter valves turns back and sends water directly back to the pool, bypassing the solar pool heating collectors.

Detailed instructions on how to set your desired water temperature and turn the system on or off can be found in your specific controller manual. If your system is controlled using your existing pool automation system, then that manual will provide steps on setting up the solar pool heating system controls. In general manuals are available online at manufacturer websites. Please note that your pool pump must be timed to run during daylight hours for your solar system to operate.

BASIC OPERATION OVERVIEW

FREEZE PROTECTION

Your system is protected from water freezing within the solar collector loop by at least one of three methods. Your current freeze protection method is ___ & ___. Instructions on setting or verifying your freeze protection method can be found in your controller manual. In general, solar pool heating systems should have two redundant means of freeze protection in place.

1. Automatic Drainback

   - When your pump shuts off the fluid in the solar pool heating collectors will automatically drain back down to the pool which removes all the fluid from the solar pool heating collectors and protects against freezing.
   - If using a differential controller with a recirculation freeze protection option, this function should be turned off to prevent the controller from turning the pump back on during a freeze event.
   - The pool filter pump must shut off at least 30 minutes prior to any freeze event. Typically, freezes occur over night and most pumps with solar pool heating systems are timed to run anywhere from 8am - 6pm.
   - Most pool equipment is protected against freezing using recirculation freeze protection so, in the event of a freeze, the pump will reengage, and the solar diverter valve should not allow water into the solar loop.

2. Recirculation Freeze Protection

   - Using this option requires that your differential controller or pool automation system has a recirculation freeze protection function.
   - During a freeze event the system will be triggered to turn the pump on (if not already running) and turn the diverter valve so that water is allowed into the solar loop.
   - Allowing water to flow through the pool equipment, solar pool heating collector, and piping ensures that water will not freeze at any point causing damage to the system.
   - Once temperature sensors indicate that the temperature has reached a certain threshold above the freezing point of water the system will turn the pump off.

SYSTEM SHUTDOWN AND OPENING

SYSTEM SHUTDOWN

1. Disable the solar pool heating function on your controller and shut pump(s) off to be safe.

2. Open the system drains to allow fluid to drain from the solar loop. Leave drains open. Ensure that water is draining to an approved/safe location.

3. Once all water has drained out of the solar loop shut the manual isolation valves on the main supply and return lines. These valves are typically location on the lines running up the wall and above the drains.

4. During the period of winterization keep the manual isolation valves shut and the drains open. The pool pump may run to protect other equipment from freezing but no water should be able to enter the solar loop during this time.

5. If water is observed coming out of the drains this indicates that the solar function is still enabled in the controller, an isolation valve is open, and/or an isolation valve is not sealing properly. Check the controller and valves and repeat steps 1-4 again.

SYSTEM OPENING

1. Close the drains on the main supply and return lines.

2. Open the manual isolation valves on the main supply and return lines.

3. Enable the solar pool heating function on your controller.

MAINTENANCE AND TROUBLESHOOTING

MAINTENANCE RECOMMENDATION

A properly installed solar pool heating system requires little to no preventive maintenance. At most a simple visual check that no leaks are present and that the diverter valve is directing water to the solar loop during daytime hours is all that should be needed. Many solar pool heating installers or pool service companies also offer annual checks to ensure that the system is operating properly.

Below are several basic steps to ensure that the solar pool heating system is functioning properly:

1. Verify that the solar pool heating function is enabled on the controller.

2. Verify that the diverter valve is functioning by setting the pool set point above the current pool temperature. Perform this operation when the solar pool heating collectors are exposed to sunlight and the pump(s) is running. Remember, the pump(s) should always run during daylight hours.

3. After performing Steps 1 & 2 the diverter valve should have turned or remained in a state where water was being directed to the solar loop. If the solar loop has a check valve with an integrated window the flapper should indicate if flow is present.

4. If the solar loop was free of water prior to startup there would be air bubbles coming out of the pool return jets at this point. The air in the solar loop is pushed out through the return jets which so this would indicate that water is circulating properly.

5. Another indicator of proper system function is feeling the temperature difference between the supply and return pipes. If the piping on the wall is not in direct sunlight the return pipe should be noticeably warmer than the supply pipe. An infrared thermometer could also be used to verify temperatures.

MAINTENANCE AND TROUBLESHOOTING

MAINTENANCE INDICATORS & TROUBLESHOOTING

1. Check the controller to make sure that no warning or error indicators are present. The most common issues are with temperature sensors. Make sure that all sensor wiring is undamaged and properly connected to the terminals in the controller. If the error persists the temperature sensor may need to be replaced.

2. Visually inspect the solar pool heating system to make sure no leaks are present. If leaks are found, or suspected, please call your solar pool heating installer or pool service company for assistance.

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