



SOLAR PUMPING FOR SWIMMING POOLS

A Brief Introduction

There are many swimming pools that are beyond the reach of power lines in Latin America, the Caribbean, the Mediterranean, and all over the world. Imagine relaxing at the pool with a noisy generator running! Pool owners with utility power can use solar pumps too, especially where the cost of power is highest during hot weather. Solar pumping is appropriate because the need for pool filtration is greatest during sunny weather when usage and algae growth are greatest. A solar pump is especially appropriate for solar heated pools. The speed of the pump is synchronous with the heat absorption of the solar heating system, which makes a harmonious match.

Solar pool pumping is economically feasible if attention is paid to the energy efficiency of the system as a whole. Here are some guidelines for system design to help you minimize the size and cost of the solar array.

Rules for energy-efficient pool pumping

The standard recommendation for pool pumping is to pump the entire volume of the pool each day. This is a legal requirement for commercial public access pools. However, most private pools are used less intensively, and can be filtered sufficiently with full circulation every two to three days. This can cut required flow rate to half or one third. Consult with your local pool expert to be sure this will work for you.

- * Choose the filter carefully. Its back-pressure is the cause of most of the power load on the pump. A large filter will impede the flow less than a small one. Cartridge filters impose less resistance than sand filters. The filter maker's specifications will show the back-pressure vs. flow rate. Two filters can be piped in parallel, to split the flow and cut the back-pressure in half.
- * Use large sized pipe to reduce friction. For a typical residential pool, this generally means 2" pipe instead of 1.5" pipe.
- * Avoid sharp 90° elbows where possible. Instead, use long-radius elbows, 45° elbows, or flexible hose.
- * Consult friction loss charts for pipe and fittings, then calculate the total pressure drop due to friction of all components.
- * Choose a pump that uses the least power for the flow and pressure required.

The *SunCentric*™ Solar Pump

Dankoff *SunCentric* DC pumps are built with efficiency in mind. They use significantly less power than AC pool pumps to produce the same pressure and flow. If your pressure requirement is low, choose one of the specialized low-lift models. The power savings will be greater. *SunCentric* can run from a battery system or directly from a solar array. To protect the pump from debris, a basket strainer is available as an accessory.

Retrofitting an existing pool system

In a retrofit situation you may not have the opportunity to follow all of our efficiency rules, but there is hope. If the owner feels that a reduced rate of flow is acceptable, then the power requirement will be reduced drastically! This easy example illustrates the principle. If the flow is reduced by 50%, the back-pressure imposed on the pump will be reduced to only 25%. Theoretically, the power required to pump 1/2 the flow at 1/4 the pressure will be 1/8, or 12.5%! Using the same arithmetic, a more modest flow reduction of 25% would reduce pressure drop to 56% and the power requirement to 42%. If you select a pump that is efficient at this reduced range, the theoretical savings can be realized. If the pump is more efficient than the original pump, then the savings will be greater still!

Supplemental methods of pool management

Modern pool technology provides methods of pool cleaning using chemistry, electro-chemistry, robotic pool cleaners, and more. These methods can be used to reduce the filtration-pumping requirement, thus allowing the use of a lower rate of flow. Consult with a pool sanitation expert to learn how these methods can reduce pumping requirements without compromising safety.

Example of a residential pool

A typical residential pool holds about 25,000 gallons. *SunCentric* model 7443 will pump the full volume every two days using a solar array of about 250 watts. The array is about the size of a twin bed. Typical retail price for the pump and array is under \$3500.

Using a backup pump

It is easy to install a *SunCentric* pump parallel to an AC pump. The AC pump can serve as a backup or to supply additional flow on cleaning day. Connect the pump intakes together. Install a low-resistance check valve at each pump's outlet, then connect the check valve outlets together. Either pump (or both) can be turned on, with no need to touch any valves.

Long-term economy

Solar pumping is a long-term investment. Most photovoltaic solar modules have a 20-year warranty, and a life expectancy beyond 30 years. The *SunCentric* pump can also last that long. It will far outlast a cheap AC pool pump because of its high industrial quality and lower rotational speed.

Further information

To determine the appropriate pump and the solar array requirement, please refer to our *SunCentric* specification sheet or our web site, or call for a referral to a qualified dealer in your area.

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