

Solar Information

Solar Pool & Spa Heating

Solar Pool/Spa Heating Basics

Pool heating is a great way to increase your comfort when in the pool, and it enables you to use your pool more months out of the year than normal, meaning that you are getting more usage out of the money that you invested in the pool in the first place. With a pool heater, you can start swimming earlier in the spring and keep swimming later into the fall. Best of all, you can use your SunMaxx Solar Hot Water System to supplement your pool heater, saving you hundreds of dollars in energy costs each and every swimming season.

There are three main types of Solar Collectors that can be used for Solar Pool Heating Systems:

- Unglazed Solar Collectors
- Glazed Flat Plate Solar Collectors
- Evacuated Tube Solar Collectors

Unglazed Solar Collectors

are specifically designed for solar pool heating applications. Typically these collectors are a polymer type bag with a black finish on the outside that is used to heat water. While extremely efficient in direct sunlight, and warm locations, these collectors are not ideal for areas other than the extreme southern United States (East and West). They are also typically the least expensive Solar Pool Heaters available.

Glazed Flat Plate Solar Collectors

are extremely efficient for use in warm, southern locations, and are generally less expensive than many other solar collectors. Though often used for domestic solar hot water systems, Flat Plate Solar Collectors are also extremely useful for Solar Pool Heating applications. SunMaxx features Pre-Packaged Solar Pool/Spa Heating Kits designed with Flat Plate Solar Collectors.

Evacuated Tube Solar Collectors

are designed to provide maximum efficiency and performance in colder, northern climates. Though more expensive than either other solar collector, Evacuated Tube Solar Collectors offer a higher return on your investment and shorter payback period in these locations because of their extended performance. SunMaxx features pre-packaged Solar Pool/Spa Heating Kits designed with Evacuated Tube Solar Collectors.



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Solar Pool Heater Sizing

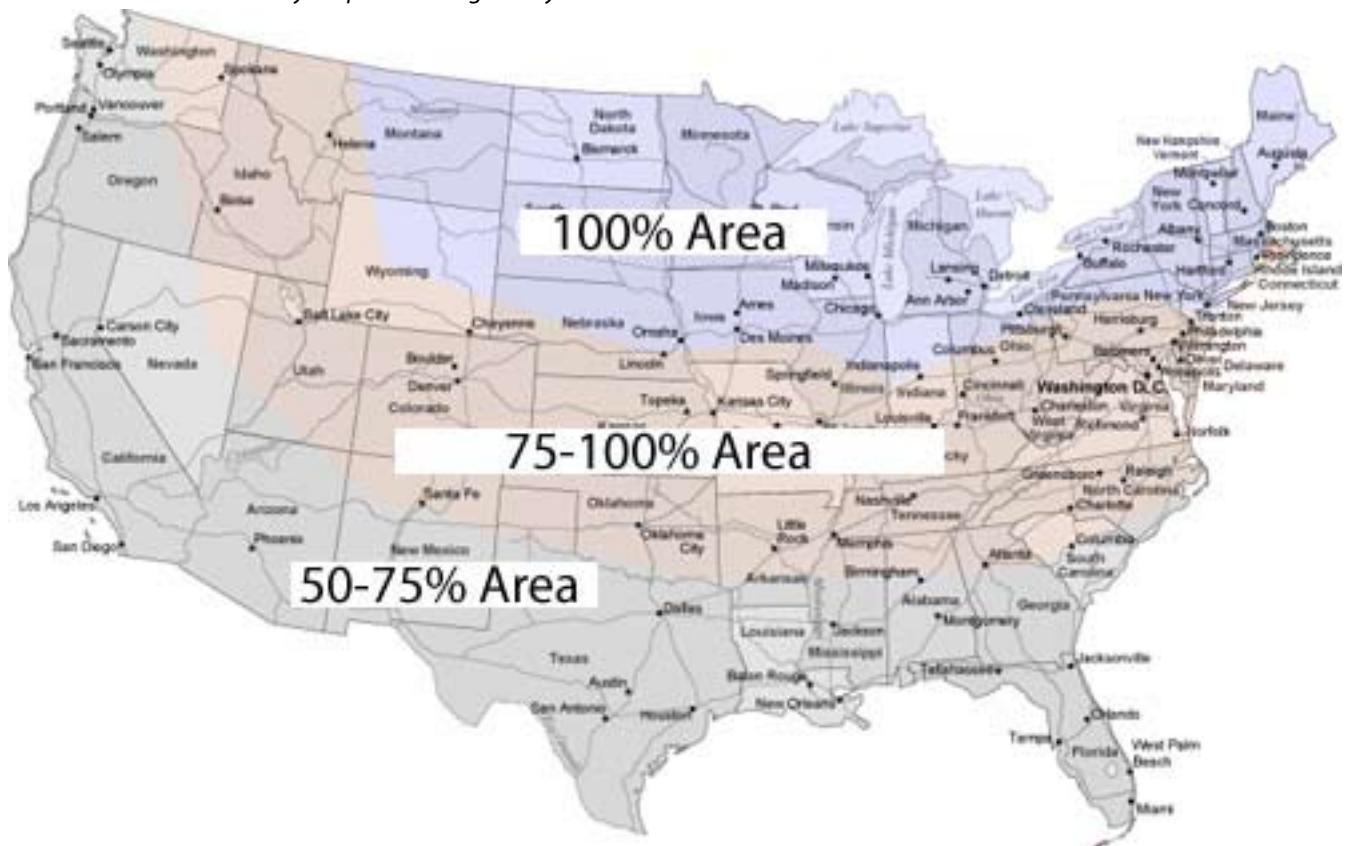
There are few basic rules to sizing Solar Pool and Solar Spa Heaters. While for larger pools, such as those at schools, resorts, or for municipal pools, sizing these systems can be tricky, and get costly. However, for the average residential pool or spa, a pre-packaged solar pool heater or spa heater from SunMaxx is typically your best bet to keep your initial costs down while still saving a significant amount of money on your pool heating expenses.

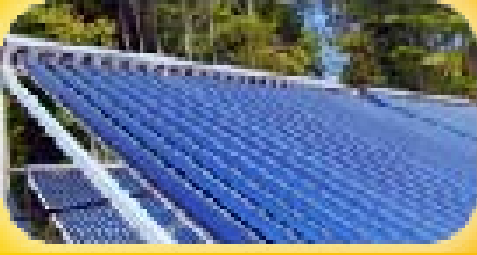
Solar Pool Heater Sizing

To get the maximum effect out of your Solar Pool Heater, and eliminate as much of your pool heating costs as possible, we recommend that customers follow the simple guidelines below. Use the map below these tips to see where you fall within the different heating zones to determine how many solar collectors you will need for your Solar Pool Heating System.

- Southern Regions - your solar collectors should be 50% of your total pool area
- Middle Regions - your solar collectors should be 75% of your total pool area
- Northern Regions - your solar collectors should be 100% of your total pool area

** These are only guidelines. Your solar pool heater can have more, or less, solar collectors depending on your budget, and the total amount of your pool heating costs you would like to offset.*





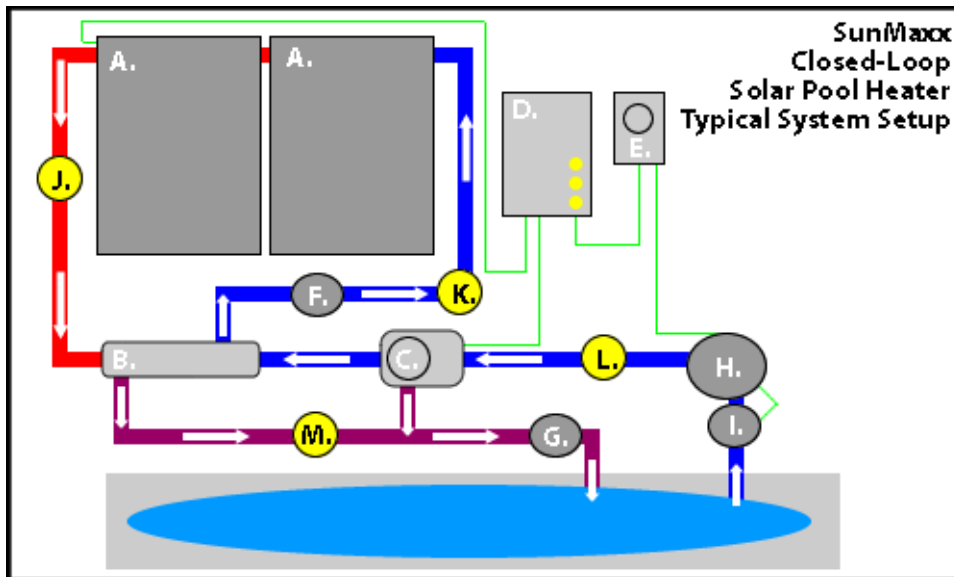
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Solar Pool & Spa Heating

Basic System Components & Design

Solar Pool & Spa Heaters have a number of basic components that are required for nearly every system that is installed. These components combine together to ensure that your Solar Pool & Spa Heater works as efficiently and cost-effectively as possible.

The diagram and parts list below show the typical layouts and components for Solar Pool & Spa Heaters.



System Components List:

- A. Solar Collectors
- B. Shell & Tube Heat Exchanger
- C. 3-Way Valve & Actuator
- D. Automatic Controller
- E. Pool Timer / Spa Timer
- F. Solar Loop Circulator Pump
- G. Backup Heater (optional)
- H. Pool Filter
- I. Pool Pump
- J. Hot Water from Solar Collectors
- K. Cold Water to Solar Collectors
- L. Water From Pool (to be heated)
- M. Water to Pool (heated)

Your Solar System Designer or Installer will be able to provide you a specialized system drawing that is specific to your location and application - this is intended to demonstrate one of the simpler designs for a solar pool & spa heating system.



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Solar Spa Heater Sizing

Sizing a solar spa heater is no more difficult than sizing a solar pool heater. There is a simple rule to follow when choosing a solar hot water system to heat your spa. The rule is:

It takes 8.3 BTU to heat 1 Gallon of water 1 degree Farenheit. Therefore:

- Hot Tub Gallons x Temperature Rise x 8.3 BTU = BTU per day required to heat hot tub

So, for instance, if you have a 200 gallon hot tub, and you know that it will lose 20 degrees overnight, you can determine how many BTUs will be required to heat your hot tub back up to temperature the following day.

200 Gallons x 20 degrees Farenheit x 8.3 BTUs = 33,200 BTUs per day to maintain proper temperature

Likewise, a smaller 100 gallon hot tub that loses 10 degrees per night will use the following equation:

100 Gallons x 10 degrees Farenheit x 8.3 BTUs = 8,300 BTUs per day to maintain proper temperature

SunMaxx Solar recommends that you use our SunMaxx-25 Evacuated Tube Solar Collectors for heating your hot tub. Using the following specs, and SRCC testing data for BTU production during a day, you can determine how many SunMaxx-25 Evacuated Tube Solar Collectors will be required for heating your hot tub or spa.

SunMaxx-25 BTU Production (BTU per day, in a warm climate for pool/spa heating applications):

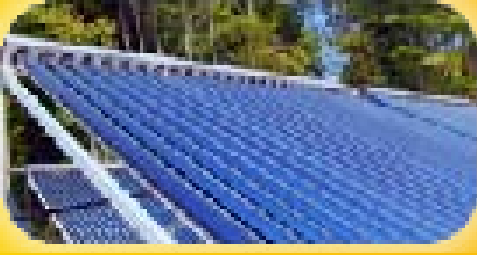
- Clear Day (2000 BTU/ft²/day): 31,000 BTU
- Mildly Cloudy (1500 BTU/ft²/day): 23,000 BTU
- Cloudy Day (1000 BTU/ft²/day): 16,000 BTU

Using our example hot tubs above, we can determine the appropriate number of SunMaxx-25 Solar Collectors needed for heating these hot tubs in areas with sunny conditions.

- 200 Gallon Hot Tub, 20 degree Temperature Rise: 33,200 BTU Needed: 1 - 2 SunMaxx-25 Solar Collectors Needed
- 100 Gallon Hot Tub, 10 degree Temperature Rise: 8,300 BTU Needed: 1 SunMaxx-25 Solar Collectors Needed

Use the space provided below to determine how many SunMaxx-25 Solar Collectors you will need in order to heat your spa or hot tub.

Hot Tub Size _____ G x Temperature Rise _____ F x 8.3 BTU = _____ BTU/day / 31,000 BTU/day
 = _____ SunMaxx-25 Evacuated Tube Solar Collectors



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Solar Pool/Spa Heating Helpful Tips

There are a few simple rules and tips that SunMaxx recommends in order to get the most production out of your Solar Pool/Spa Heater and get the most efficiency and best payback out of your system. While these are only suggestions, we strongly suggest that all customers follow them to get the most out of their Solar Pool/Spa Heater.

Always Use Pool/Spa Covers

In order for your Solar Pool/Spa Heater to have any positive effect you **MUST** use a cover on your pool or hot tub. The majority of the heat loss from a spa or pool occurs from the water being exposed to the air. If you are letting your pool or hot tub surface be exposed to the air when it is not in use, you are simply counter-balancing the Solar Pool Heater, and wasting your investment - wasting money!

Start Smaller and Build Up

SunMaxx Solar Hot Water Systems are designed to be expandable. In other words, you can start with a smaller system and expand on it, adding additional solar collectors down the road. This is a tremendous opportunity - you can start with a smaller pre-packaged solar pool heating system, and then, down the road, as additional money is available, or you decide that you would to offset more and more of your heating costs, you can easily integrate these additional collectors into the existing system without hassle.

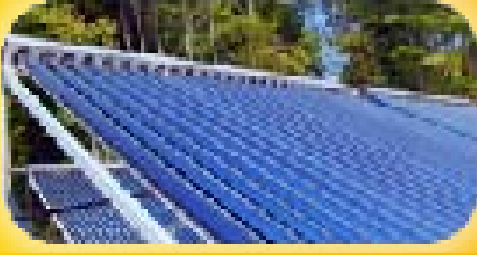
We give this same advice to customers looking for Solar Radiant Heating. It offers an affordable entry into Solar Hot Water with the ability to expand, and save more and more money down the road.

Solar Heating is a Supplement, Not a Replacement

Remember that very rarely, if ever, your Solar Pool Heater will replace your current pool heater. In fact, the two are designed to run in tandem. The Solar is used to bring your pool up to temperature as much as possible from the system. If the solar contribution is not adequate, or if it is a cloudy day, your existing pool heater will make up the difference left over by the solar. Sometimes, however, depending on the size and heat loss, your spa may be completely heated by your Solar Hot Water System, though we still recommend that you maintain the standard heating system, just in case.

Solar Pool & Spa Heating is for ALL LOCATIONS

regardless of what anyone tells you, Solar Pool and Spa Heaters can work in any and all locations (where outdoor swimming is available). Even in Northern Climates, such as upstate New York, a Solar Pool Heater will extend your swimming season, allowing you to enjoy your pool earlier in the spring and later into the fall. In some locations, such as the southeast and the desert southwest, a solar pool heater can allow you to swim all year long with no pool shutdowns.



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Solar Pool & Spa Heating

Pre-Package Solar Pool & Spa Heaters

SunMaxx offers a variety of Pre-Packaged Solar Pool & Spa Heaters that are designed to offer an affordable, efficient entry into the world of Solar Hot Water. These kits are perfectly sized to heat all but the largest hot tubs, and will provide a significant amount of heating for most residential backyard pools. However, for larger pools, or to cut your pool heating bill even further, additional solar collectors may be added to these systems in order to provide additional heating capacity.

If you have a larger pool, or would like to look at a solar pool heater that is larger than these pre-packaged systems, please ask your dealer, installer or a SunMaxx Technician today.

Each Pre-Packaged Solar Pool & Spa Heater from SunMaxx includes the following:

- SunMaxx Evacuated Tube or Flat Plate Solar Collectors
- TACO Solar Hot Water Circulator Pump (for the Solar Collector Loop)
- 45K BTU/hr Shell & Tube Heat Exchanger
- Solar Pool & Spa Heating Controller
- Three Way Valve & Automatic Actuator
- Temperature Sensors (for controlling automatic operation)

See below for available models.

Model	Solar Collectors	Climate	Pool Heating	Spa Heating
SunMaxx-25-Pool-1	1x SunMaxx-25	Cold/Any	Yes	Yes
SunMaxx-25-Pool-2	2x SunMaxx-25	Cold/Any	Yes	Yes
SunMaxx-FP-Pool-1	1x SunMaxx-FP	Warm Only	Yes	Yes
SunMaxx-FP-Pool-2	2x SunMaxx-FP	Warm Only	Yes	Yes