



SunRay 1000 Solar Water Pasteurizer Pre-Installation Guidelines

By following simple written instructions, people with basic skills and a few common hand tools can install the SunRay 1000. All plumbing connections are made with threaded and compression-type fittings that do not require special tools.

In addition to the SunRay 1000 system, additional parts are needed for the installation. These items can be purchased from Safe Water Systems, from a local supplier, or from a combination of both sources.

Additional parts that are required for all installations include:

- Mounting hardware kit
- Water filter housing and mounting bracket
- Particulate filter cartridge
- Safe water storage tank
- Shut-off valves for water source and safe water storage tank
- Pipe and pipe fittings to connect water source and tanks to the SunRay 1000
- Aluminum foil tape to wrap pipe insulation
- Safe water storage tank

Depending on the site-specific conditions, additional parts that may be required for installation include:

- Check Valve (if the safe water tank is on the same level as the SunRay 1000)
- Supply tank with float valve or pressure-reducing valve kit (see below)
- Hand Pump or Solar Pump (see below)
- Taste & odor filter cartridges

For additional information on each of these items, request a copy of the SunRay 1000 installation instructions.

Water Source

The most important aspect to plan carefully in advance is how the water source will be connected to the SunRay 1000. There are two basic alternatives. One is where there is an existing piped water source. The other is where the water source is below the level where the SunRay-1000 will be installed, such as a river, lake, stream or shallow well.

Where there is an existing pipe water source, whether it is from a spring, overhead tank, municipal water supply or other pressurized source, the SunRay-1000 can be connected directly to the source as long as the inlet pressure is not greater than 20 psi (pounds per square inch). This would likely be the case only from a municipal water connection or where the water source is higher than 45 feet of vertical rise above the installation location.

If the inlet pressure is greater than 20 psi, the thermal control valve may be forced open and untreated water could flow into the safe water storage tank. In this case the pressure must be reduced by installing either a small elevated tank with a float valve (float tank) or a pressure-reducing valve and pressure tank. For simplicity, the float tank method is recommended. For additional information on either of these options, please contact Safe Water Systems.

Where a piped water supply is not already available and the water source is below the level where the SunRay 1000 will be located, an elevated supply tank can be installed. The bottom of this tank must be a minimum of 2 meters above the base of the SunRay 1000. A height of 3 meters will improve performance.

There are three choices to transfer water into the supply tank: by hand, with a hand operated pump, or with a solar electric powered pump. Filling by hand is least expensive but labor intensive. Using a hand operated pump is easier than filling by hand and relatively low cost. A solar electric powered pump provides completely automatic operation and is considerably more expensive.

If filling the supply tank is done only once in the morning, (either by hand or with a hand pump) the tank must hold at least a one-day supply of 1,000 liters. If the tank can be replenished throughout the day, a smaller tank may be used.

The supply tank may be installed on a nearby hillside, on a sturdy building or a special tower may be constructed. Careful attention should be given to the mounting of the supply tank since a 1,000 liter tank, when full of water, will weigh more than 960 kilograms / 2,100 pounds.

Safe Water Storage Tank

After the pasteurized water exits the SunRay 1000, it must be stored in a sanitary storage tank that is covered and sealed. The safe water storage tank should ideally be placed below the level of the SunRay 1000 outlet so the disinfected water can easily flow by gravity into the tank. If the tank is at the same level as the SunRay 1000, a check-valve must be installed.

The safe water storage tank should be sized to hold a minimum of one day's production of 1,000 liters. A larger tank can store drinking water for consumption during cloudy days when less water will be produced.

Distribution Containers

Disinfected water from the storage tank is normally distributed by filling containers that are taken to the point of use. Use containers with small necks to prevent recontamination by dirty hands and dipping cups. If water distribution containers are needed, please contact Safe Water Systems.

It is very easy to re-contaminate disinfected water by using dirty containers. All tanks and distribution containers must be washed with a disinfectant (such as bleach) and kept clean. The tanks and containers should be purchased as close to the installation site as possible to avoid unnecessary shipping charges.

Pipe and Fittings

The pipe and fittings used to connect the SunRay 1000 to the supply tank and safe water storage tanks are not supplied unless ordered separately

NOTE: The pipe and pipe fittings that are used near the SunRay 1000 connection points must be copper, galvanized steel or CPVC (gray, special high temperature PVC). Regular (white) PVC, polyethylene or other plastic pipes must not be used, as they will melt from the high water temperature.

For best performance, the SunRay 1000 should face true south in the northern hemisphere and true north in the southern hemisphere. The collector needs to be exposed to the sun and must not be shaded at all from 9:00 am to 4:00 pm every day of the year. Any shading on the collector will reduce the quantity of water produced.

Supplies and Tools

The following items are required for installation. They are not supplied unless ordered separately:

- Copper tubing cutter (for copper pipe)
- Large flat jaw adjustable wrench ("crescent wrench")
- Large square jaw type pliers ("water pump pliers", "Channel Locks" etc.)
- Combination wrench and socket with ratchet: 10mm, 12mm, 13mm
- Large and medium standard screwdriver, large and medium Phillips screwdriver
- Hole saw to fit bulkhead fittings for tanks
- Teflon (plumber's) tape
- Concrete blocks and/or concrete for ground mounting
- For mounting on concrete: power drill and masonry drill bits
- For mounting on ground: hand drill or power drill and drill bits