

Solar Sausage Photovoltaic SYSTEM - User Manual



Solar Sausage Project 'B' Design Team

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Installation • Operation • Maintenance

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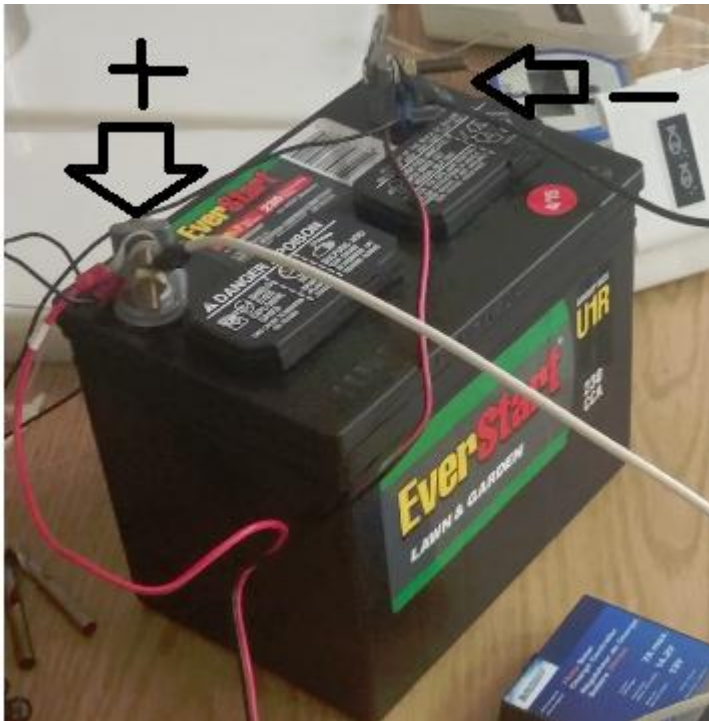
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Battery

Warning: Ensure that the battery is in a dry location, far away from any pumps, pipes, or water. Wet batteries may cause corrosion, power leakage, or sparks.

The setup

1. Once a safe place is selected for the battery, ensure that it is sitting upright, and on a flat sturdy surface.
2. Connect the positive wire from the charge regulator (the solid red wire) to the positive battery terminal (the one labeled with the “+” sign)
3. Connect the negative the wire from the charge regulator (the black and red wire) to the negative terminal (labeled with the “-” sign)



The battery used in the prototype of this project

The load shall also be connected to the battery. Ensure that the positive and negative terminals of the load are connected to the positive and negative terminals of the battery (see steps 2 & 3 above as a reference).

Maintenance

Batteries should be inspected approximately once a week. The observer should be checking for any leaks or corrosion. If there are any leaks that battery should be disconnected and replaced IMMEDIATELY! If there is any corrosion on the battery terminals then the following steps should be taken:



Figure 2: Corrosion on a battery may look something like this

1. Take the proper precautions to protect yourself. The corrosion can be a skin irritant and may cause problems with clothing.
2. Disconnect all other connections to the battery's terminals (charge controller, load, etc.)
3. Mix baking soda and warm water together in a bowl.
4. Soak wire brush in mixture for a few minutes
5. Brush all corrosion off battery terminals.
6. Rinse terminals with cool water
7. dry
8. Coat with natural oil (petroleum jelly).
9. Replace all connections and dispose, or clean, of gloves and protective wear

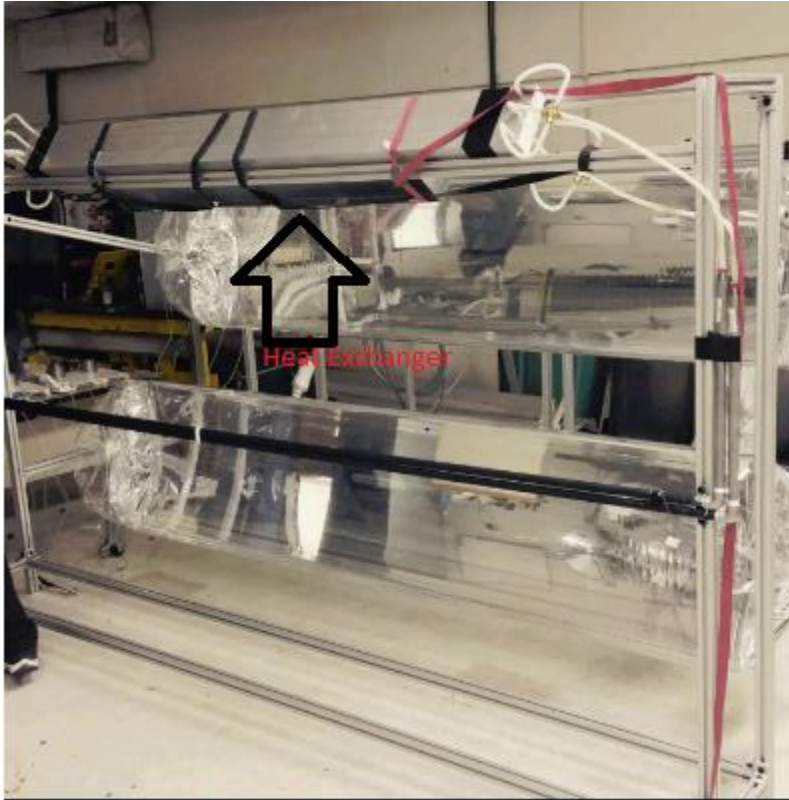
Heat Exchanger



WARNING: Never touch a heat exchanger while it is in use, contents of the heat exchanger may be hot and cause SEVERE burns to skin.

Setup

The structural support system must be set up first. Once the entire system is in place then the heat exchanger may be placed in the top of the overall system. The picture above shows the exchanger placement in the overall structural design in the prototype of this system. See picture below to see where on the overall system the heat exchanger is placed.



1. If the support system is constructed correctly the heat exchanger (with the solar panels attached to the front) should pop in place.
2. Once the heat exchanger is popped in place then the plumbing should be connected.
3. The heat exchanger on the bottom (the one that is connected to the solar panels) should be connected to the water pump (1) and to the pipe that leads down to the pasteurization pipes (2).
4. The top heat exchanger should be connected to the receiver tube that will bring the water back up from the pasteurization process (3).
5. The side that is facing the pump should be connected to the pipe that leads into the pasteurized water collector (4).

Maintenance

The heat exchangers should be inspected each time the solar panels are inspected to ensure proper connection and use. The heat exchangers, if unchecked, can malfunction and cause significant damage to the system as a whole.

1. Take heed to the warning issued above, for it is for your own benefit.
2. If the heat exchanger itself is leaking turn off the water pump, and allow water inside to cool
3. Once water is cooled to a manageable temperature the exchangers should be detached from the entire system. Reversing the steps completed to install it.
4. Once the exchanger is unhooked from the system the pump should remain off until another is exchanger is in its place.

If there are any connections that are leaking please follow these steps:

1. Turn off the water pump and allow water inside to cool.
2. Use a pipe wrench, pliers, or Allen key to tighten up all loose screws, nuts, and bolts.
3. After all screws, nuts, and bolts are tightened power may be restored to the water pump.
4. If the leaks continue please contact the distributor

Pasteurization Pipes



WARNING: Do not touch pasteurization pipes! Pipes are hot and may cause extreme scalding!

The pasteurization pipes are a set of 10' black pipes

Setup

1. The structural support has clamps that will hold the pasteurization pipes in place.
2. 1 pipe should be connected to the receiving tube of the heat exchanger that is connected to the solar panels (1).
3. Then the pipe should be connected to the other using a ½" insulated hose that's about 6" in length.
4. The other end of that insulated hose is connected to the other 10' pipe (3)
5. The second 10' pipe is to be laid parallel with the first pipe directly on top of it.
6. Connect the opposite end of the 2nd 10' pipe to the receiving tube of the top heat exchanger (2).

Upon completion of this the water pump should be powered up and ran in slow pulses to ensure that all connections are leak free.

Maintenance

Inspection should be done on the pasteurization pipes every few days to ensure no leakage, cracks, or bursts have occurred. If one of the following has occurred please follow these steps:

1. Take heed to the warning issued above, for it is for your own benefit.
2. If a pipe itself is leaking turn off the water pump, and allow water inside to cool
3. Once water is cooled to a manageable temperature the pipes should be detached from the entire system. Reversing the steps completed to install it.
4. Once the faulty pipe is unhooked from the system the pump should remain off until another is operational pipe is in its place.
 - a. If power is restored to the pump without this pipe then the system will spray hot water where the pipe used to be.

If there are any connections that are leaking please follow these steps:

1. Turn off the water pump and allow water inside to cool.
2. Use a pipe wrench, pliers, or Allen key to tighten up all loose screws, nuts, and bolts.
3. After all screws, nuts, and bolts are tightened power may be restored to the water pump.
4. If the leaks continue:
 - a. Leave the power off
 - b. Place a warning sign on this part of the equipment to alert others not to restore power
 - c. Contact your regional distributor.

Water Pump

WARNING: Keep all wires and electrical components away from the water bucket and other mediums that are based on water.

The FLOJET (or any other) water pump is used to pump water from the water source to the heat exchanger. The pump is a self-priming pump, so there is no need to add water into the system to prime it.

Installation

Installing the FLOJET is relatively simple.

1. Turn the pump upside down so that the arrows on the top of the pump point towards the heat exchanger.
2. Place the on the left side of the structure.
3. Use a harness or any other adhesive to attach the pump to the structure.

Operation

Operation of the pump should run smoothly.

1. There should be only a quiet hum of the motor after it has primed.

Maintenance

1. Make sure the connections are not lose or coming apart.
2. Check the connections from the inlet hose and the outlet hose for leaks.

Pressure Regulators

Installation

1. Place the regulators on the side of the structure on a flat surface.

Operation

1. Make sure the regulators are maintaining the proper pressures.

Maintenance

1. Wipe off the regulators with a soft cloth, if weather residue is present.

Solar Sausage

The Solar Sausage is a photovoltaic system that provides electricity and potable water for impoverished countries.

Installation

1. Inflate the sausage.
2. Make sure the sausage has no leaks.
3. Place the clamp bolts that are on each end of the sausage in the clamps on the structure.
4. Attach the hoses on the left end of the sausages to the connections on the pressure regulators.

Operation

Operation of the Solar Sausages is extremely easy.

1. Check for leaks
2. Make sure the pressure in the upper hemisphere is .5 psi and the lower hemisphere is .495 psi
3. Deflate if necessary.

Maintenance

1. Make sure that the tubing is not starting to crack due to the weather.
2. Make sure the glue at the seams are not coming apart due to heat.
3. If any moisture or residue are on the sausage wipe it off with a soft cloth.