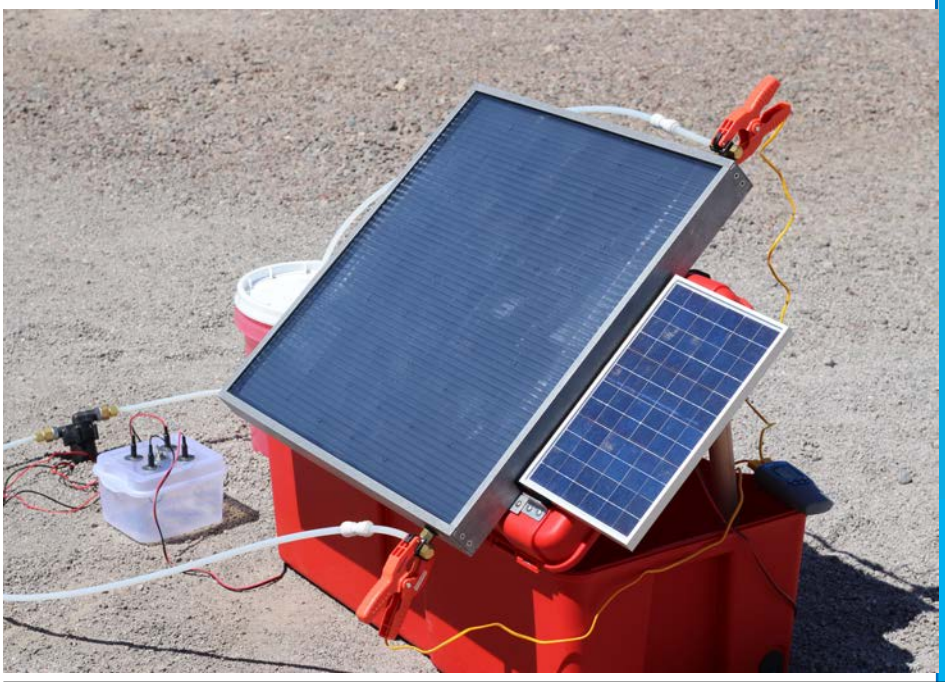

Solar Thermal Water Heater Manual

Laboratory Experience

Solar Energy | Water | Environment
Nexus IN NEVADA

UNLV Howard R. Hughes College of ENGINEERING

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5) Turn the Dual Temperature Meter on. T1 and T2 are both shown in the digital screen. When the system is first powered on and water is flowing, the T1 and T2 temperature readings may vary within 0.2 degrees. This is a normal error for this particular temperature meter.

6) Power the system ON by flipping the switch on the Switched Electrical Circuit. Note the time the system is powered on, as well as the temperatures at T1 and T2. These are the initial temperature measurements.

7) As the system runs, record T1 and T2 at periodic time intervals from zero (initial temperature) to 15 minutes. Take at least 5 measurements

Temperature and Flow Measurement Chart			
Initial Water Temperature:			
Interval	Time (min:sec)	T1 (inlet)	T2 (Outlet)
1 (~ 3 min)			
2 (~ 6 min)			
3 (~ 9 min)			
4 (~ 12 min)			
Final Water Temperature:			
Flow Rate: 1 Liter / sec		1 Liter/sec = 0.001 m^3/sec = 15.9 gal/min	

Measuring Flow Rate and Flow Rate Conversions

1) Locate the volumetric container.
2) While the system is running, remove the lid to the water container so that the end of the outlet hose can be manipulated. Keep the water flow into the bucket.
3) Simultaneously, place the hose into the volumetric container and start the timer.
4) Stop the timer as soon as the container becomes full.
5) Note the **volume** of the container, as well as the time, in seconds, it took to fill the container.
6) Flow rate is volume per unit time.
7) Discard the water from the volumetric container back into the bucket.
8) Replace the lid.
9) Record the flow rate in the table on page 9. Then convert the flow rate to gal/min as shown below.
10) Fill in the graph on the next page for Temperature versus Time. Use the data collected for T2. Also add points indicating the initial and final temperatures of the water. Note the unit used for temperature measurement on the y-axis.

    What can be concluded from the graph?

Volumetric Container

Covert to L/s (Insert calculated time in the parenthesis): $\frac{1\ Liter}{(\quad)s} = \_\_\_\_\_\ L/s$

Convert to m^3/s (Insert value above): $(\quad)L/s * \frac{0.001\frac{m^3}{s}}{1\frac{L}{s}} = \_\_\_\_\_\ m^3/s$

Convert to gal/min (insert L/s value above): $(\quad)L/s * \frac{15.9\frac{gal}{min}}{1\frac{L}{s}} = \_\_\_\_\_\ gal/min$

Temperature Change Versus Time for Solar Thermal Hot Water Heating