

Intermittent Water Mist Cooling

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Project 3

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Project Description

- The main goal of this study was to investigate the solar module output efficiency by using an intermittent water mist cooling system.
- Testing based on two solar modules
- Control solar module and
- Misting solar module

Testing Hours

- Testing occurred from 11.00 am to 3.00 pm for 5 days
- Measurement were made of
 - Surface temperature, Output voltage, Output current, Ambient temperature and ambient solar illumination.
- Took data for several days and due to cloudy weather condition we used only three days of 3.4.201the data for analysis.

Testing procedures

Data was collected every 5 minutes for one minute at 30 samples per minute

Both panels tracked the sun by adjusting the position of the panels manually.

Misting solar module:

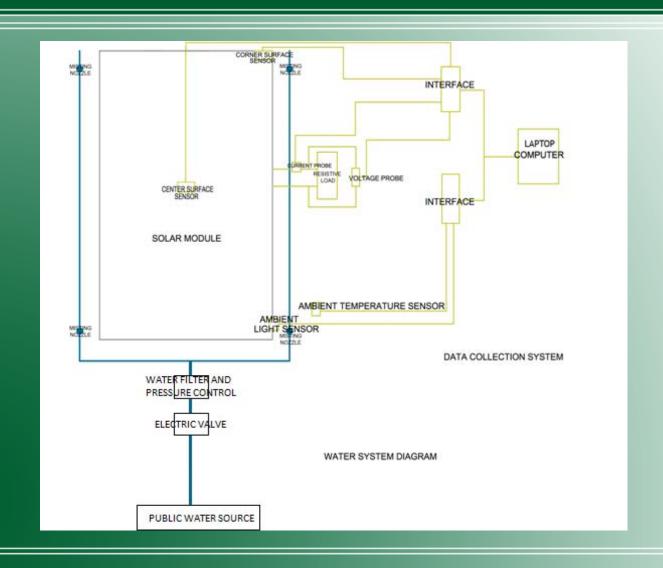
1st configuration: Misted for one minute every six minutes for two days

2nd configruation: Misted for one minute every eleven minutes for one day

Control module:

Collected data on one module that was not cooled (no misting)

Spring Solar Undergraduate Research Program (Misting Module Test Configuration)



Power Gain related to control module(6 min misting interval)

Power gain related to control module (11 minute misting interval)

Conclusions

- One minute mistig followed by five minutes of no misting (6 min interval) produced a 20.8% power gain while the one min misting followed by ten min of no misting (11 min interval) produced a 15.2% power gain.
- The intermittent misting systems used 85.7% (6 min misting interval) to 90.9% (11 min. misting interval) less water than a continuous mist cooling system.
- Comment: Add a table showing how the power gains compare between continuous misting (summer and spring) and intermittent misting.

• Questions?