Abstract

The performance characteristics of double pass solar air heater (DPSAH) were evaluated theoretically and experimentally. Actual hourly weather data for Baghdad, Iraq was used to assess the DPSAH in December 2016 and January 2017. The results of the study indicated that increasing airflow rate through the collector increases the instantaneous efficiency and the useful energy gained but it reduces the air outlet temperature rapidly. An air outlet temperature was about 37 oC at midday for airflow rate of 0.01 m3/s. The maximum value of the average performance line was 63 %. It was found that the present DPSAH outlet air temperature greater than single pass solar air heater (SPSAH) by 3 oC for the same airflow rate. Moreover, the average difference between the theoretical and the experimental results was 3 %.

References


Index Terms

Computer Science

Information Sciences
Keywords

Double pass, solar air heater, experimental study, mathematical model, performance study.