

## Modeling and Performance Analysis of an Air-Cooled Absorption Chiller

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**Abstract :** Due to the high cost and the environmental problems caused by the conventional air-conditioning systems, various researches are being increasingly focused on thermal comfort in the building sector integrating renewable energy sources, particularly solar energy. For that purpose, this study aims to present a modeling and performance analysis of a direct air-cooled Water/LiBr absorption chiller. The chiller is considered to be coupled to a small residential building at an arid zone situated in south Algeria. The system is modeled with TRNSYS simulation program. The main objective is to study the feasibility of the chosen system in arid zones and to apply a simplified method to predict the performance of the system by mean of the characteristic equation approach tacking in account the influence of the climatic conditions of the considered site, the collector area and storage volume of the hot water tank on the performance of the installation. First, the results of the system modeling are compared with an experimental data from the open literature and the developed model is then validated. In another hand, a parametric study is performed to analyze the performance of the direct air-cooled absorption chiller at the operating conditions of interest for the present study. Thus, the obtained results has shown that the studied system can present a good alternative for cooling systems in arid zones since the cooling load is roughly in phase with solar availability.

**Keywords :** absorption chiller, air-cooled, arid zone, thermal comfort

**Conference Title :** ICTE 2015 : International Conference on Thermal Engineering

**Conference Location :** London, United Kingdom

**Conference Dates :** December 10-11, 2015