

Accepted Manuscript

Title: Performance comparison of solar autonomous and assisted absorption systems in Spain

Author: Pedro J. Martínez, José C. Martínez, Pedro Martínez

PII: S0140-7007(16)30253-5

DOI: <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2016.08.009>

Reference: IJIR 3406

To appear in: *International Journal of Refrigeration*

Received date: 8-5-2016

Revised date: 13-7-2016

Accepted date: 20-8-2016

Please cite this article as: Pedro J. Martínez, José C. Martínez, Pedro Martínez, Performance comparison of solar autonomous and assisted absorption systems in Spain, *International Journal of Refrigeration* (2016), <http://dx.doi.org/doi: 10.1016/j.ijrefrig.2016.08.009>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



PERFORMANCE COMPARISON OF SOLAR AUTONOMOUS AND ASSISTED ABSORPTION SYSTEMS IN SPAIN

Pedro J. Martínez^{*}, José C. Martínez, Pedro Martínez

Departamento Ingeniería de Sistemas Industriales, Universidad Miguel Hernández,
Avda. de la Universidad, s/n, 03202 Elche, Spain

Highlights

- The model of a solar air conditioning installation was developed and validated
- “Temperature level” control was implemented in the TRNSYS simulation
- The installation was studied operating as an autonomous system
- The effect of the alignment between cooling load and solar radiation was studied
- The electricity consumption associated with the absorption machine is high

Abstract

Solar-powered air conditioning systems can reduce electricity consumption and peak demand. The objective of this work was to develop and validate a TRNSYS model of the solar air conditioning installation at the Universidad Miguel Hernández de Elche. The model was then used to study the operation of the facility as an autonomous system and as a solar-assisted system (with backup) under different climatic conditions in Spain (Barcelona, Madrid, Bilbao and Seville). The autonomous system was able to maintain the comfort temperature between 60.8% (Sevilla) and 78.3% (Madrid) of the hours for the studied period. Working with a backup compression chiller, the cooling provided by the absorption chiller ranged from 52.8% of the total cooling demand in Bilbao to 75.3% in Madrid. The high initial cost and the high associated electricity consumption explain why the binomial solar thermal collector–absorption machine has failed to break into the market so far.

^{*} Corresponding author. Fax: +34 966 65 89 79.
E-mail address: pjuan.martinez@umh.es (Pedro J. Martínez).

Download English Version:

<https://daneshyari.com/en/article/5017237>

Download Persian Version:

<https://daneshyari.com/article/5017237>

[Daneshyari.com](https://daneshyari.com)