

(0040)

Air Conditioner Unit with Thermal Energy Storage by Closed Loop System

Zamri Noranai

Centre for Energy and Industrial Environment Studies,
Universiti Tun Hussein Onn Malaysia.
E-mail: zamrii2003@yahoo.com.my

Isyraq Shammil Mohd Kasim Mazlipah,
Faculty of Mechanical Engineering & Manufacturing
Universiti Tun Hussein Onn Malaysia
E-mail: atromen@facebook.com.my

Mohammad Zainal Bin Md Yusof
Jabatan Kejuruteraan Aeronautik,
Faculty of Mechanical Engineering & Manufacturing,
Universiti Tun Hussein Onn Malaysia
E-mail: mdzainal@uthm.edu.my

Abstract

Energy demand is continue increasing and ends up with high energy cost. Thermal Energy Storage (TES) can be used as an alternative solution to reduce energy cost. The main reason of using TES system is to shift high energy demand from peak period to off peak period. Meanwhile, for building owner is to reduce energy cost by take opportunity low cost energy during off peak period. The purpose of this study is to develop a split unit air conditioner by substituting the circulation system with stored ice. The research were conducted by fabricated a small unit air-conditioning integrated with ice storage and closed loop circulation system. Combination of Ethylene Glycol and chill water were used as circulation medium in this unit. Water pump was used to circulate cooling medium between ice storage tank and evaporator. Series of experiments were conducted to test cooling performance of the developed product to produce cooling effect inside a chamber room. The experiments were conducted in a chamber room located at Centre for Energy and Industrial Environment Studies, Universiti Tun Hussein Onn Malaysia. Finally, from experiment found 0.15 meter³ of solid ice with -5°C had successfully maintained chamber design temperature for 8 hours.

Keywords: Air Conditioner; Glycol; Thermal Energy Storage;