

ABSTRACT

Heating, Ventilation, and Air-Conditioning (HVAC) is a system that functions to regulate temperature, humidity, and distribution of air in the room according to the function of the building. In a HVAC system there is a part called the Air Handling Unit (AHU) which functions the same as an indoor unit in the Split Air-Conditioning system. Chilled Water - Water Cooling System is one of the large-scale HVAC systems, so far no one has made this system small in size as an academic necessity. AHU made consists of Coil with Copper material and Aluminum plate which is cooled by the cold side of TEC with Multipass Plate Exchanger type. This research was conducted to obtain AHU performance by using 2 fluids, namely air and water. Mass air flow rate is 0.081 kg/s and the water mass flow rate is (0.025, 0.017, and 0.011) kg/s, the AHU performance can be evaluated through heat transfer coefficient (U) and effectiveness value (ϵ). Every water flow rate of the mass water was tested 10 times until the Steady State condition of all temperature change information was collected by a datalogger. Based on experiments conducted mass water flow rates produce different values of ϵ . Where the average in the first experiment was 34.688%, the second experiment was 38.363% and the third experiment was 53,134%. Therefore the water mass flow rate of 0.011 kg/s has the best effectiveness value in the experiments conducted.

Key Word: AHU, mass flow rate, effectiveness.