

ABSTRAK

Air aki adalah salah satu komponen utama dalam kendaraan, baik itu mobil/motor. Semua kendaraan memerlukan air aki untuk dapat menghidupkan mesin motor/mobil (mencatu arus pada dinamo starter kendaraan). Tujuan dari penelitian ini adalah: (a) Merancang dan merakit mesin penghasil air aki (akuades) yang mempergunakan sistem kompresi uap dan mempergunakan pipa pencurah air. (b) Mengetahui karakteristik dari mesin kompresi uap yang dipergunakan di dalam mesin penghasil air aki yang meliputi COP_{aktual} , COP_{ideal} , dan efisiensi., (c) Mengetahui banyaknya air perjam yang dihasilkan oleh mesin penghasil air aki, untuk berbagai macam variasi Penelitian dilakukan di Laboratorium Perpindahan Panas Teknik Mesin Universitas Sanata Dharma Yogyakarta. Mesin penghasil air aki bekerja dengan siklus kompresi uap. Komponen utama mesin siklus kompresi uap adalah: kompresor, kondensor, pipa kapiler, evaporator dan peralatan tambahan filter dengan fluida kerja R22a.

Mesin dirancang dengan ukuran p x l x t : 185cm x 50cm x 77cm. Penelitian dilakukan dengan memvariasikan kondisi: (a) kipas bekerja secara terus menerus tanpa air tercurah melalui pipa pemancur air, (b) kipas bekerja secara terus menerus dan air tercurah melalui pipa pemancur air, (c) kipas bekerja selang seling secara terus menerus (5 menit on 5 menit off) dan air tercurah melalui pipa pemancur air, (d) kipas bekerja selang seling secara terus menerus (10 menit on 10 menit off) dan air tercurah melalui pipa pemancur air, dan (e) Kipas bekerja selang seling secara terus menerus (15 menit on 15 menit off) dan air tercurah melalui pipa pemancur air.

Mesin penghasil air aki berhasil dibuat dan bekerja dengan baik. Dengan rentang waktu 60 menit untuk kipas bekerja secara terus menerus tanpa air tercurah melalui pipa pemancur air mampu menghasilkan air sebanyak 947 ml, 60 menit untuk kipas bekerja secara terus menerus dan air tercurah melalui pipa pemancur air menghasilkan air sebanyak 1240 ml. 60 menit untuk kipas bekerja selang seling secara terus menerus (5 menit on 5 menit off) dan air tercurah melalui pipa pemancur air menghasilkan air sebanyak 1263 ml, 60 menit untuk kipas bekerja selang seling secara terus menerus (10 menit on 10 menit off) dan air tercurah melalui pipa pemancur air menghasilkan air sebanyak 1160 ml, 60 menit untuk kipas bekerja selang seling secara terus menerus (15 menit on 15 menit off) dan air tercurah melalui pipa pemancur air menghasilkan air sebanyak 1107 ml.

Kata Kunci: Mesin Penghasil Air Aki, Sistem Kompresi Uap, *Psychrometric Chart*.

ABSTRACT

Distilled battery water is an important component in motor vehicle, be it car or motorcycle. Every motor vehicle needs distilled battery water to turn the engine on (trigerring current to start the dynamo). The objectives of this research are: (a) designing and assembling the machine that produces distilled water using steam compressor system and water pouring pipes, (b) identifying the characteristics of steam compressor machine used in the water distilling machine consisting of COP_{actual} , COP_{ideal} , and its efficiency, (c) measuring the hourly production of water – related researches were conducted in the laboratory of caloric movement of Engineering Study Program of Sanata Dharma University. The water distilling machine worked in steam compression cycle. The main components of the machine are compressor, condenser, capillary pipes, evaporator and additional filters of R22a work fluid.

The machine was assembled in the measurement of p x l x t : 185cm x 50cm x 77cm. The research was conducted in varied conditions: (a) the fan moved endlessly without any water poured from the pipes, (b) the fan moved endlessly and water poured from the pipes, (c) the fan moved consecutively and periodically (5 minutes on and 5 minutes off) and water was poured from the pipes, (d) the fan moved consecutively and periodically (10 minutes on and 10 minutes off), and (e) the fan moved consecutively and periodically (15 minutes on and 15 minutes off) and water was poured from the pipes.

The water distilling machine was successfully operational. For 60 minutes the fan moved endlessly without water poured from the pipes and the distilled water produced was 947 ml. For 60 minutes the fan moved endlessly with water poured from the pipes and the distilled water produced was 1240 ml. For 60 minutes the fan moved consecutively and periodically (5 minutes on and 5 minutes off) and the distilled water produced was 1263 ml. For 60 minutes the fan moved consecutively and periodically (10 minutes on and 10 minutes off) and the distilled water produced was 1160 ml. For 60 minutes the fan moved consecutively and periodically (15 minutes on and 15 minutes off) and the distilled water produced was 1107 ml.

Keywords: Water distilling machine, Steam compression system, Psychrometric chart

