

Analisis Dampak Kenaikan Tegangan Input Pada Modul Termoelektrik Terhadap Kesetimbangan Temperatur Sisi Panas dan Dingin Pada Termoelektrik cooler (TEC) *Helmet*

(Analysis of the Impact of the Increase in Input Voltage on the Thermoelectric Module on the Temperature Equilibrium on the Hot and Cold Side of the Thermoelectric Cooler (TEC) Helmet)

Dosen Pembimbing I, Azamataufiq Budiprasojo, ST. MT

Aldi Exa Rotama Putra
Automotive Mechine Study Program
Majoring of Engineering

ABSTRACT

The manufacture of cooling helmets aims to minimize the feeling of heat in the helmet and provide comfort to helmet users. This cooling helmet uses a thermoelectric as a cooling medium. The cooling helmet component consists of a TEC 1-12706 peltier, fan casing, heatsink, and aluminum plate. The aluminum plate is installed on the cold side of the peltier and the heatsink is attached to the hot side of the peltier. The installation of the peltier on the heatsink must be properly attached so that the heat on the peltier can be completely absorbed by the heatsink and blown out by the fan. To determine the heat transfer equilibrium that occurs in the thermoelectric cooler (TEC) Helmet, the voltage varies from 3, 4.5, 6, 7.5, 9, 10.5, 12 volts. From the test results that have been carried out, it can be seen that the impact of the increase in input voltage can affect temperature changes at T_{hot} and T_{cold} and the duration to reach the maximum limit of the lowest point of T_{cold} and the highest point of T_{hot} at each voltage variation. From several predetermined voltage variations, the optimal cooling is at a voltage of 12 volts with a current of 2.09 amperes resulting in the highest temperature T_{hot} 47 °C and lowest T_{cold} 12 °C with a duration of 100 seconds. The resulting temperature change is 35 °C and the power used is 21.72 Watts. The amount of heat released on the hot side is 214.786 Watt and the amount of heat absorbed on the cold side is 141.420 Watt.

Keywords: Thermoelectric Cooler(TEC) Helmet, TEC 1-12706, Voltage Variation