



EXPERIMENTAL INVESTIGATION OF THE PERFORMANCE OF VORTEX TUBE SYSTEM USED FOR CONTROL PANELS COOLING

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<https://doi.org/10.30572/2018/KJE/160223>

ABSTRACT

To meet the urgent need for effective cooling solutions in a manufacturing setting, the effectiveness of a vortex tube system for cooling electrical control panels is carefully investigated in this experimental study. This paper presents a novel strategy to improve cooling efficiency in industrial settings by investigating the creative use of a vortex tube for panel cooling. The main goal of this work is to extend the cooling procedure for the electronic control panel and the method of impacting different pressures (1 to 7 bar) on the system's performance. This work offers core information on the activity and capability of using the vortex tube for cooling purposes by performing some tests in Basrah / Iraq for three days during June 2023. Detecting perfect operation conditions enhances the cooling performance and reduces power consumption. The finding confirms that air pressure at the entrance has an impact on the allocate the ability of the system on the cooling. This confirms that the coefficient of performance (COP) of 0.12 is produced by 4 bar internal air pressure. Achieving solutions for high performance cooling is critical for the control panel of the manufactural field. This study helps lower energy consumption, improve equipment reliability, and lessen environmental effects by examining the operation of a vortex tube system and optimizing cooling efficiency.

KEYWORDS

Vortex tube; Control panels; Compressed air-cooling; Ranque-Hilsch tube, COP.

