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Energy Consumption Control of An Air-Cooled Chiller from the Use of An Automatic ON/OFF Timer System: A Real Case Study of the Penang State Mosque

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Abstract

The manual operation of an ON/OFF controller that is being widely used in the air-cooled chiller of the air conditioning system is found to have resulted in a significant daily variation of electricity usage. As such, this study had aimed to investigate the effect from the application of a pre-programmed auto timer control system (ADTCS ON/OFF) on the performance of an air-cooled chiller and its main components in the Penang State Mosque. The ADTCS ON/OFF that had been developed for both the indoor and outdoor usage was installed to an existing air conditioning electrical distribution board (DB) via an external control panel, which had consisted of a selector switch with a timer operation, a power supply, an ON/OFF push button for the AHU, a lamp indicator as well as that of a digital timer (brand Honeywell HWTHTC711A). Apart from demonstrating the implementation of the ADTCS ON/OFF control system as contributing to a more consistent operation time, this study had also shown the manual operation of the air-cooled chiller as contributing to an impactful loss of approximately 9.6 hours or 3182 kWh on a normal day when being compared to that of the ADTCS ON/OFF control system. Since the findings from this research had shown the use of an ADTCS ON/OFF control system in the air-cooled chiller system as providing a positive implication of the monthly electricity cost to the Penang State Mosque and the mosque institutions as a whole, this therefore suggests that a big savings of expenditure can also be achieved from the implementation of such a system.

Keywords

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