

Combining Chiller and Variable Frequency Drives

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Abstract : In most buildings, according to US Department of Energy Data Book, the electrical consumption attributable to centralized heating and ventilation of air-condition (HVAC) component can be as high as 40-60% of the total electricity consumption for an entire building. To provide efficient energy management for the market today, researchers are finding new ways to develop a system that can save electrical consumption of buildings even more. In this concept paper, a system known as Intelligent Chiller Energy Efficiency (iCEE) System is being developed that is capable of saving up to 25% from the chiller's existing electrical energy consumption. In variable frequency drives (VFDs), research has found significant savings up to 30% of electrical energy consumption. Together with the VFDs at specific Air Handling Unit (AHU) of HVAC component, this system will save even more electrical energy consumption. The iCEE System is compatible with any make, model or age of centrifugal, rotary or reciprocating chiller air-conditioning systems which are electrically driven. The iCEE system uses engineering principles of efficiency analysis, enthalpy analysis, heat transfer, mathematical prediction, modified genetic algorithm, psychometrics analysis, and optimization formulation to achieve true and tangible energy savings for consumers.

Keywords : variable frequency drives, adjustable speed drives, ac drives, chiller energy system

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