Experimental Investigation of the Performance of a Design Model for Vapor Compression Refrigeration Systems

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Abstract

In this study, a design model for vapour compression refrigeration systems developed by Akintunde (2003a) was used to develop a practical refrigeration system. The system developed by using the design model (rig a) was compared experimentally with another system, built out of original components (rig b) and of the same capacities, under the same experimental conditions. The experimental investigations were based on important parameters such as refrigeration inventory, condensing, and evaporating temperatures, coefficient of performance (COP) and refrigeration efficiency. Previous analysis and experimental investigations carried out by Akintunde (2003a) showed that the model results were comparable to the experimental ones and the performance data were comparable to the experimental ones and the performance data were comparable to those in the ASHRAE handbook and other literature. The present results show that the maximum absolute deviations are within the ranges 19% and 35% for a rig a and rig b, respectively, as compared with the model results.

Keywords: Vapour compression, system, refrigeration capacity, COP, comparison.