High Accuracy Measurement of Total Losses in Fractional Horsepower Induction Motors

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***Abstract*—Large and small single-phase and three-phase induction motors are commonly used in industrial applications. The present work represents an attempt towards the design of a high accuracy system for the measurement of fractional horsepower (FHP) induction motor losses and efficiency. The calorimeter designed and built is capable of measuring heat losses of up to 1 kW with an overall accuracy better than 3%. During all tests, ambient temperature, humidity, motor speed and motor frame temperature were recorded using precise digital instruments. The inlet, outlet temperatures and resulting losses were recorded automatically using a high accuracy 12-bit data acquisition system. The preliminary results obtained demonstrate the suitability of the designed calorimeter for the accurate measurement of losses in FHP induction motors.**

***Index Terms*—Induction motor, fractional HP motor, calorimeter, calorimetry, motor losses, efficiency.**

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