HYBRID METHOD OF INDUCTION MOTORS
EFFICIENCY DETERMINATION

Konrad Jacek Dąbala

ABSTRACT

In the work the hybrid method for the determination of the efficiency of squirrel-cage induction motors of a closed construction was presented. In this method the influence of measurement conditions that are determined by selected parameters accordingly to the proposed algorithms for the efficiency of the mentioned induction motors is taken into account. The name "hybrid" is justified with the fact that in this method the measuring process is connected with calculations that require the design and material data of the considered motor. These computations are based on the algorithms that are similar to the algorithms used in the designing process, however, with the application of measurement data.

Moreover, the new models of the power flow in the motor as well as modifications of iron and mechanical losses and new methods associated with these models and modifications for the efficiency determination were elaborated. The interval arithmetic for the estimation of the border systematic error of the efficiency as well as the errors of measuring instruments and laboratory devices used for the efficiency determination was applied.

The application of this method is advantageous for the motor users as well as producers. For the users – because they receive the efficiency value which is more similar to real, for the producers – because the measurement inaccuracies lead to the lowering of the determined efficiency of the motor produced by them.

Keywords: electrical machines, squirrel-cage induction motors, efficiency, methods of induction motors efficiency determination