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DESIGN OPTIMIZATION OF THE ROTOR OF AN INDUCTION MOTOR BY FIELD METHOD

The use of the field method of calculating the electromagnetic parameters of an induction motor will reduce the error in determining the energy performance at the design stage of the induction motor and allows to do without traditional research methods based on alternate circuits.

In this regard, the peculiarities of the calculation of electromagnetic parameters of induction motors were considered. The analysis and choice of mathematical methods for researches and optimization of geometrical dimensions of a rotor of induction motors is carried out.

The general characteristic of the software for field calculation of induction motors is executed. An electromagnetic field model of an induction motor has been developed, which takes into account the geometric features of the design of the active part of the stator and rotor core, as well as the spatial location of the stator winding and squirrel-cage rotor winding.

An approach to the construction of a spatial mathematical model of electromagnetic field distribution in the design of the active part of an induction motor with a squirrel-cage rotor is developed, which allows to determine the optimal dimensions of the core and squirrel-cage rotor winding to improve the energy performance of an induction motor.

As a result of improving the design of the core and squirrel-cage of the rotor of an induction motor, an increase in net power by 0,91% and efficiency by 1,03%, while the total losses remain approximately unchanged.