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Asynchronous Motor with Ferromagnetic Sections of Squirrel-Cage Winding

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Краткое описание

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Краткое описание

One of the ways of energy and resource savings is to reduce the voltage of a squirrel-cage motor when the asynchronous electric drive underloaded. The requirements for an asynchronous motor operating in conjunction with a semiconductor voltage regulator are proposed. It is necessary to maintain an approximate constancy of the ratio of idle and load losses during regulation and to achieve small nonlinear distortions and slip changes in the working areas of the adjusting mechanical characteristics. Small starting current multiplications and increased starting torques are also required. The fulfillment of such requirements is achieved by the formation of an 'excavator' mechanical characteristic of the motor using the effect of current displacement in shielded or ferromagnetic sections of the short-circuited winding. The fulfillment of these requirements increases the technical and economic performance and competitiveness of the named electric drive. The efficiency of the installation of ferromagnetic elements in the short-circuiting frontal sections of the rotor winding has been confirmed experimentally. Technological technical solutions of rotor options with frontal ferromagnetic elements consist in the installation of tubular steel shanks with protrusions of connection with the winding elements on the shaft. © 2022 IEEE.

Ключевые слова автора

asynchronous motor; control characteristics; current; energy saving; experiment; ferromagnetic elements; manufacturability; rotor design; rotor winding; starting torque; voltage regulator

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Engineering main heading

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