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Identification of Parameters and Power Losses of Six-Phase Asynchronous Machines by Induction Regenerative Method

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Abstract

The work is focused on identifying the equivalent circuit parameters and power losses of a six-phase asynchronous motor with the cage rotor, using a laboratory bench with an adjustable three-phase power supply and without mechanical load. For asynchronous machines, the induction method with recovery was adapted, according to which one three-phase system of the six-phase stator winding is energised and operates in motor mode. The second three-phase system works in generator mode, idling or short-circuited. With theoretical arguments, an equivalent scheme of the six-phase motor in induction mode with recovery was proposed. The methodology for identifying the parameters of the equivalent scheme and the constant and additional power losses of the six-phase asynchronous motor was developed. Multiple experimental measurements confirmed the correctness of the proposed methodology.

Keywords: induction motors, voltage measurement, power measurement, power supplies, rotors, stator windings, loss measurement, hexaphase asynchronous motors, power losses

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