

Power Circuit Schemes in AC Drive is Made by Condition of the Minimum Electric Losses

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Abstract: The article defines the necessity of choosing the optimal power circuits scheme of the electric drive with field regulated reluctance machine. The specific weighting factors are calculation, the linear regression dependence of specific losses in semiconductor frequency converters are presented depending on the values of the rated current. It is revealed that with increase of the carrier frequency PWM improves the output current waveform, but increases the loss, so you will need depending on the task in a certain way to choose from the carrier frequency. For task of optimization by criterion of the minimum electrical losses regression dependence of the electrical losses in the frequency converter circuit at a frequency of a PWM signal of 0 Hz. The surface optimization criterion is presented depending on the rated output torque of the motor and number of phases. In electric drives with field regulated reluctance machine with at low output power optimization criterion appears to be the worst for multiphase circuits. With increasing output power this trend hold true, but becomes insignificantly different optimal solutions for three-phase and multiphase circuits. This is explained to the linearity of the dependence of the electrical losses from the current.

Keywords: field regulated reluctance machine, the electrical losses, multiphase power circuit, the surface optimization criterion

Conference Title: ICIE 2016: International Conference on Industrial Engineering

Conference Location: Boston, United States

Conference Dates: April 25-26, 2016