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Stability of Electric Drives Optimized by Nonlinearity

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Abstract

This paper investigates the electric drive with a nonlinear correction device optimization with a dynamic change of link parameters. The time constants dependences of thyristor converter and executive motor in this case were calculated. The stability conditions of the built automatic control system and conditions for the occurrence of self-oscillations are calculated. On the basis of conducted studies, the possibility of such optimization has been proven. © 2024 IEEE.

Author keywords

automatic control system; control quality indicators; dynamic characteristics; electric drive; link; nonlinear correction link; self-oscillation; stability limit; system stability; transfer function

Indexed keywords

Engineering controlled terms

Automation; Control system stability; Control systems; Convergence of numerical methods; Electric drives; Electric machine control; Energy conversion; Industrial electronics; Process control; Thyristors

Engineering uncontrolled terms

Automatic control systems; Control quality; Control quality indicator; Dynamics characteristic; Link; Nonlinear correction; Nonlinear correction link; Quality indicators; Self-oscillations; Stability limit; System's stabilities

Engineering main heading

Transfer functions

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