1. Record Nr. UNINA9910583507203321

Autore	Asanbayev Valentin
Titolo	Asynchronous Machines : Basic Calculation Elements from Field Equations / / by Valentin Asanbayev
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2022
ISBN	9783030922849 9783030922832
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (459 pages)
Disciplina	621.3136
Soggetti	Power electronics Electric machinery Electronic circuits Power Electronics Electrical Machines Electronic Circuits and Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction to Theory of Calculating Asynchronous Machines -- Electromechanical Interactions in Asynchronous Machines: Basic Physical Phenomena -- Interconnections of Basic Physical Phenomena: Kirchhoff's Equations -- Rotating Magnetic Field and Electromagnetic Torque: Practical Expressions for Calculating -- Voltage Equations through Space Vectors -- Voltage Equations and Machine Equivalent Circuit: Formation of Fragments -- Air Gap EMF Equations: Self-and Mutual Induction Reactances -- Equivalent Circuits of Machine Design Fragments: "No-Load and Under-Load" Concept -- "No-Load and Under-Load" Concept: Techniques for Implementing -- Machine Equivalent Circuit in Phase System of Units: Techniques for Constructing -- Calculation Elements by Using Resulting Magnetic Field: Phase System of Units -- Calculation Elements in Specific System of Units: Techniques for Determining -- Calculation Elements by Using Resulting Magnetic Field: Specific System of Units -- L-shaped Equivalent Circuits for Machine Design Fragments -- Calculation

Elements of Machine with Single-Cage Rotor: “Field” Concept -- Calculation Elements of Machine with Wound Rotor: “Field” Concept. .

Sommario/riassunto

This book attempts to eliminate the existing “imbalance” between the theory of electric machines and the theory of electromagnetic fields. In order to develop viable methods for engineering calculations, the author applies field equations. The resulting, new methods consist of traditional calculation elements represented in a refined form (circuit-loops, parameters, equivalent circuits and voltage equations). These calculation methods should be effective both for researchers and engineering practitioners, especially, in relation to the modern electric machines, such as powerful turbine generators, large high-speed synchronous motors, etc. Provides conditions for the generalization of the field research results; Expands capabilities of engineering calculation methods; Improves upon the theory of engineering calculations, under the conditions of the Maxwell’s equations.