1. Record Nr. UNINA9910139001103321 Autore Pyrhonen Juha Titolo Design of rotating electrical machines // Juha Pyrhonen, Tapani Jokinen, Valeria Hrabovcova Chichester, West Sussex, United Kingdom:,: Wiley,, 2014 Pubbl/distr/stampa **ISBN** 1-118-70165-8 1-118-70159-3 1-118-70162-3 Edizione [Second edition.] 1 online resource (614 p.) Descrizione fisica Classificazione TEC031000 Altri autori (Persone) JokinenTapani <1937-> HrabovcovaValeria Disciplina 621.31/042 Soggetti Electric machinery - Design and construction Electric generators - Design and construction Electric motors - Design and construction Rotational motion Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and index. Nota di contenuto DESIGN OF ROTATING ELECTRICAL MACHINES; Contents; Preface; About the Authors; Abbreviations and Symbols; 1 Principal Laws and Methods in Electrical Machine Design; 1.1 Electromagnetic Principles; 1.2 Numerical Solution; 1.3 The Most Common Principles Applied to Analytic Calculation; 1.3.1 Flux Line Diagrams; 1.3.2 Flux Diagrams for Current-Carrying Areas: 1.4 Application of the Principle of Virtual Work in the Determination of Force and Torque; 1.5 Maxwell's Stress Tensor; Radial and Tangential Stress; 1.6 Self-Inductance and Mutual Inductance: 1.7 Per Unit Values: 1.8 Phasor Diagrams Bibliography 2 Windings of Electrical Machines; 2.1 Basic Principles; 2.1.1 Salient-Pole Windings; 2.1.2 Slot Windings; 2.1.3 End Windings; 2.2 Phase Windings; 2.3 Three-Phase Integral Slot Stator Winding; 2.4 Voltage Phasor Diagram and Winding Factor; 2.5 Winding Analysis; 2.6 Short Pitching; 2.7 Current Linkage of a Slot Winding; 2.8 Poly-Phase Fractional Slot Windings; 2.9 Phase Systems and Zones of Windings;

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Sommario/riassunto

"This book is an in-depth essential reference of rotating electrical machine design theory and application. In the first part of the book the general theory governing the design of an electrical machine is presented; addressing the necessary fundamentals of electromagnetic theory; exploring possible winding arrangements and resistances; describing the behaviour of the magnetic circuit and flux leakage. After this introduction of principles the main body of the book focuses on the design of a rotating electrical machine. The book defines basic characteristics such as machine type (e.g. synchronous, asynchronous, DC and doubly salient reluctance machines) and type of construction (e. g. external pole, internal pole, axial flux and radial flux machines). It then moves on to provide a detailed analysis of the design process and properties of rotating electrical machines including the insulation and heat removal options. The book illustrates the necessary analytical calculations for machine design through direct design examples i.e. a permanent magnet motor for normal speeds with rotor surface magnets, traditional squirrel cage induction motor, a low speed high torque fractional slot permanent magnet motor etc."--