

# Design Of Brushless Permanent Magnet Motors Monographs In Electrical And Electronic Engineering

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*Electric Drives and Their Controls* Richard M. Crowder  
1998 Despite the rapid growth of automation in industry and the increasing importance of electric drive systems, there are few books which cover this subject in detail. This is the first book to offer a very practical but structured approach to drive systems. It will show the reader how to size, select and implement an industrial drive system. Particular emphasis is given to smaller drive systems with detailed illustrations from the machine tool and robotics industry. This book will prove invaluable to students in electrical machinery and drive courses, and drive designers in industry and academic research laboratories.

**Analysis of Electrical Machines** Valeria Hrabovcova  
2020-05-20 This book is devoted to students, PhD students, postgraduates of electrical engineering, researchers, and scientists dealing with the analysis, design, and optimization of electrical machine

properties. The purpose is to present methods used for the analysis of transients and steady-state conditions. In three chapters the following methods are presented: (1) a method in which the parameters (resistances and inductances) are calculated on the basis of geometrical dimensions and material properties made in the design process, (2) a method of general theory of electrical machines, in which the transients are investigated in two perpendicular axes, and (3) FEM, which is a mathematical method applied to electrical machines to investigate many of their properties.

**Electromagnetic Linear Machines with Dual Halbach Array**  
Liang Yan 2016-09-15 This book extends the conventional two-dimensional (2D) magnet arrangement into 3D pattern for permanent magnet linear machines for the first time, and proposes a novel dual Halbach array. It can not only effectively increase the radial component of magnetic flux density and output force of tubular linear machines, but also significantly reduce the axial flux

density, radial force and thus system vibrations and noises. The book is also the first to address the fundamentals and provide a summary of conventional arrays, as well as novel concepts for PM pole design in electric linear machines. It covers theoretical study, numerical simulation, design optimization and experimental works systematically. The design concept and analytical approaches can be implemented to other linear and rotary machines with similar structures. The book will be of interest to academics, researchers, R&D engineers and graduate students in electronic engineering and mechanical engineering who wish to learn the core principles, methods, and applications of linear and rotary machines.

Switched Reluctance Motors and Their Control Timothy John Eastham Miller 1993

*Advances in Systems, Control and Automation* Avinash Konkani 2017-12-11 This book comprises the select proceedings of the ETAEERE 2016 conference. The book aims to shed light on different systems or machines along with their complex operation, behaviors, and linear-nonlinear relationship in different environments. It covers problems of multivariable control systems and provides the necessary background for performing research in the field of control and automation. Aimed at helping readers understand the classical and modern design of different intelligent automated systems, the book presents coverage on the control of linear and nonlinear systems, intelligent systems, stochastic control, knowledge-based systems applications, fault diagnosis and tolerant control, real-time control applications, etc. The contents of this volume will prove useful to researchers and professionals alike.

**Permanent-magnet and Brushless DC Motors** Takashi Kenjō 1985 Small electric motors are crucial to the manufacture of industrial robots, numerically controlled machines, and computer peripherals such as disk drives and printers. In this handbook, Dr. Kenjo considers two of the most important small motors, permanent-magnet and brushless DC motors, explaining how to select the most

suitable motor for the the intended application and how to design the drive circuitry. The book provides clear descriptions of the basic machine structure, the constructional relationships between conventional and brushless DC machines, and the drive and control circuitry. Generously illustrated and easy-to-follow. *Electrical Machine Drives Control* Juha Pyrhonen 2016-10-10 This comprehensive text examines existing and emerging electrical drive technologies. The authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines. Also including links to a number of industrial applications, the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application. Key features: \* Provides a comprehensive summary of all aspects of controlled-speed electrical drive technology including control and operation. \* Handling of electrical drives is solidly linked to the theory and design of the associated electrical machines. Added insight into problems and functions are illustrated with clearly understandable figures. \* Offers an understanding of the main phenomena associated with electrical machine drives. \* Considers the problem of bearing currents and voltage stresses of an electrical drive. \* Includes up-to-date theory and design guidelines, taking into account the most recent advances. This book's rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled-speed electrical drive technologies for Electrical Engineering MSc or PhD students studying electrical drives. It also serves as an excellent reference for practicing electrical engineers looking to carry out design, analyses, and development of controlled-speed electrical drives. **Computing Algorithms with Applications in Engineering** V. K. Giri 2020-03-02 This book collects high-quality research papers presented at the International

Conference on Computing Applications in Electrical & Electronics Engineering, held at Rajkiya Engineering College, Sonbhadra, India, on August 30-31, 2019. It provides novel contributions in computational intelligence, together with valuable reference material for future research. The topics covered include: big data analytics, IoT and smart infrastructures, machine learning, artificial intelligence and deep learning, crowd sourcing and social intelligence, natural language processing, business intelligence, high-performance computing, wireless, mobile and green communications, ad-hoc, sensor and mesh networks, SDN and network virtualization, cognitive systems, swarm intelligence, human-computer interaction, network and information security, intelligent control, soft computing, networked control systems, renewable energy sources and technologies, biomedical signal processing, pattern recognition and object tracking, and sensor devices and applications.

**Design of axial-flux permanent-magnet low-speed machines and performance comparison between radial-flux and axial-flux machines** Asko Parviainen 2005

**Noise of Polyphase Electric Motors** Jacek F. Gieras 2018-10-03 Controlling the level of noise in electrical motors is critical to overall system performance. However, predicting noise of an electrical motor is more difficult and less accurate than for other characteristics such as torque-speed. Recent advances have produced powerful computational methods for noise prediction, and *Noise of Polyphase Electric Motors* is the first book to collect these advances in a single source. It is also the first to include noise prediction for permanent magnet (PM) synchronous motors. Complete coverage of all aspects of electromagnetic, structural, and vibro-acoustic noise makes this a uniquely comprehensive reference. The authors begin with the basic principles of noise generation and radiation, magnetic field and radial forces, torque pulsations, acoustic calculations, as well as noise and vibration of mechanical and acoustic origin. Moving to applications,

the book examines in detail stator system vibration analysis including the use of finite element method (FEM) modal analysis; FEM for radial pressure and structural modeling; boundary element methods (BEM) for acoustic radiation; statistical energy analysis (SEA); instrumentation including technologies, procedures, and standards; and both passive and active methods for control of noise and vibration. *Noise of Polyphase Electric Motors* gathers the fundamental concepts along with all of the analytical, numerical, and statistical methods into a unified reference. It supplies all of the tools necessary to improve the noise performance of electrical motors at the design stage.

*Bond Graph Modelling of Engineering Systems* Wolfgang Borutzky 2011-06-01 The author presents current work in bond graph methodology by providing a compilation of contributions from experts across the world that covers theoretical topics, applications in various areas as well as software for bond graph modeling. It addresses readers in academia and in industry concerned with the analysis of multidisciplinary engineering systems or control system design who are interested to see how latest developments in bond graph methodology with regard to theory and applications can serve their needs in their engineering fields. This presentation of advanced work in bond graph modeling presents the leading edge of research in this field. It is hoped that it stimulates new ideas with regard to further progress in theory and in applications.

*Sensorless Vector and Direct Torque Control* Peter Vas 1998 In recent years, vector-controlled a.c. drives have taken over from more conventional d.c. drives. Vas examines the sensorless vector-controlled drives and direct torque-controlled drives, and looks at their applications.

*The Standard Handbook for Aeronautical and Astronautical Engineers* Mark Davies 2003 Designed as a one-stop reference for engineers of all disciplines in aeronautical and aerospace engineering, this handbook seeks to filter mechanical engineering applications to

specifically address aircraft and spacecraft science and military engineering.

**Design of Brushless Permanent-magnet Motors** J. R.

Hendershot 1994 Brushless permanent-magnet motors provide simple, low maintenance, and easily controlled mechanical power. Written by two leading experts on the subject, this book offers the most comprehensive guide to the design and performance of brushless permanent-magnetic motors ever written. Topics range from electrical and magnetic design to materials and control. Throughout, the authors stress both practical and theoretical aspects of the subject, and relate the material to modern software-based techniques for design and analysis. As new magnetic materials and digital power control techniques continue to widen the scope of the applicability of such motors, the need for an authoritative overview of the subject becomes ever more urgent. Design of Brushless Permanent-Magnet Motors fits the bill and will be read by students and researchers in electric and electronic engineering.

**Permanent Magnet Brushless DC Motor Drives and Controls**

Chang-liang Xia 2012-04-24 An advanced introduction to the simulation and hardware implementation of BLDC motor drives A thorough reference on the simulation and hardware implementation of BLDC motor drives, this book covers recent advances in the control of BLDC motor drives, including intelligent control, sensorless control, torque ripple reduction and hardware implementation. With the guidance of the expert author team, readers will understand the principle, modelling, design and control of BLDC motor drives. The advanced control methods and new achievements of BLDC motor drives, of interest to more advanced readers, are also presented. Focuses on the control of PM brushless DC motors, giving readers the foundations to the topic that they can build on through more advanced reading Systematically guides readers through the subject, introducing basic operational principles before moving on to advanced control algorithms and implementations Covers special issues, such as sensorless control,

intelligent control, torque ripple reduction and hardware implementation, which also have applications to other types of motors Includes presentation files with lecture notes and Matlab 7 coding on a companion website for the book

*Vehicle Propulsion Systems* Lino Guzzella 2007-09-21 The authors of this text have written a comprehensive introduction to the modeling and optimization problems encountered when designing new propulsion systems for passenger cars. It is intended for persons interested in the analysis and optimization of vehicle propulsion systems. Its focus is on the control-oriented mathematical description of the physical processes and on the model-based optimization of the system structure and of the supervisory control algorithms.

Design of Brushless Permanent-magnet Machines J. R.

Hendershot 2010-01-01 Brushless permanent-magnet motors provide simple, low maintenance, and easily controlled mechanical power. Written by two leading experts on the subject, this book offers the most comprehensive guide to the design and performance of brushless permanent-magnetic motors ever written. Topics range from electrical and magnetic design to materials and control. Throughout, the authors stress both practical and theoretical aspects of the subject, and relate the material to modern software-based techniques for design and analysis. As new magnetic materials and digital power control techniques continue to widen the scope of the applicability of such motors, the need for an authoritative overview of the subject becomes ever more urgent. Design of Brushless Permanent-Magnet Motors fits the bill and will be read by students and researchers in electric and electronic engineering.

*New Trends in Electrical Vehicle Powertrains* Luis Romeral Martinez 2019-01-30 The electric vehicle and plug-in hybrid electric vehicle play a fundamental role in the forthcoming new paradigms of mobility and energy models. The electrification of the transport sector would lead to advantages in terms of energy efficiency and reduction of greenhouse gas emissions, but would

also be a great opportunity for the introduction of renewable sources in the electricity sector. The chapters in this book show a diversity of current and new developments in the electrification of the transport sector seen from the electric vehicle point of view: first, the related technologies with design, control and supervision, second, the powertrain electric motor efficiency and reliability and, third, the deployment issues regarding renewable sources integration and charging facilities. This is precisely the purpose of this book, that is, to contribute to the literature about current research and development activities related to new trends in electric vehicle power trains.

**Permanent Magnet Motor Technology** Jacek F. Gieras  
2011-06-03 The importance of permanent magnet (PM) motor technology and its impact on electromechanical drives has grown exponentially since the publication of the bestselling second edition. The PM brushless motor market has grown considerably faster than the overall motion control market. This rapid growth makes it essential for electrical and electromechanical engineers and students to stay up-to-date on developments in modern electrical motors and drives, including their control, simulation, and CAD. Reflecting innovations in the development of PM motors for electromechanical drives, *Permanent Magnet Motor Technology: Design and Applications, Third Edition* demonstrates the construction of PM motor drives and supplies ready-to-implement solutions to common roadblocks along the way. This edition supplies fundamental equations and calculations for determining and evaluating system performance, efficiency, reliability, and cost. It explores modern computer-aided design of PM motors, including the finite element approach, and explains how to select PM motors to meet the specific requirements of electrical drives. The numerous examples, models, and diagrams provided in each chapter facilitate a lucid understanding of motor operations and characteristics. This 3rd edition of a bestselling reference has been thoroughly revised to include: Chapters on high speed

motors and micromotors Advances in permanent magnet motor technology Additional numerical examples and illustrations An increased effort to bridge the gap between theory and industrial applications Modified research results The growing global trend toward energy conservation makes it quite possible that the era of the PM brushless motor drive is just around the corner. This reference book will give engineers, researchers, and graduate-level students the comprehensive understanding required to develop the breakthroughs that will push this exciting technology to the forefront.

**Stepping Motors and Their Microprocessor Controls**

Takashi Kenjo 1994 Stepping motors are used wherever repeated stop-start or intermittent motions are encountered. Found in a diverse range of machines such as clocks, typewriters, automatic draughting machines, numerically controlled machine tools, and computer peripherals, stepping motors offer easy compatibility with digital equipment and ease of control. This thoroughly updated second edition of *Stepping Motors* offers a practical approach to the subject and relates the workings, design, and construction of these motors to underlying electromagnetic principles. The reader is taken through a brief history of stepping-motor development and is provided with expert treatments of the theory, terminology, control systems, and likely applications associated with the devices. The text is copiously illustrated with clear and helpful diagrams and contains much detailed information. It is the perfect introduction for students and professionals in electrical and electronic engineering.

**Robotics and Automation Handbook** Thomas R. Kurfess  
2018-10-03 As the capability and utility of robots has increased dramatically with new technology, robotic systems can perform tasks that are physically dangerous for humans, repetitive in nature, or require increased accuracy, precision, and sterile conditions to radically minimize human error. The *Robotics and Automation Handbook* addresses the major aspects of designing, fabricating, and enabling robotic systems and their

various applications. It presents kinetic and dynamic methods for analyzing robotic systems, considering factors such as force and torque. From these analyses, the book develops several controls approaches, including servo actuation, hybrid control, and trajectory planning. Design aspects include determining specifications for a robot, determining its configuration, and utilizing sensors and actuators. The featured applications focus on how the specific difficulties are overcome in the development of the robotic system. With the ability to increase human safety and precision in applications ranging from handling hazardous materials and exploring extreme environments to manufacturing and medicine, the uses for robots are growing steadily. The Robotics and Automation Handbook provides a solid foundation for engineers and scientists interested in designing, fabricating, or utilizing robotic systems.

#### **Permanent Magnet Synchronous and Brushless DC Motor Drives**

Ramu Krishnan 2017-12-19 Despite two decades of massive strides in research and development on control strategies and their subsequent implementation, most books on permanent magnet motor drives still focus primarily on motor design, providing only elementary coverage of control and converters. Addressing that gap with information that has largely been disseminated only in journals and at conferences, *Permanent Magnet Synchronous and Brushless DC Motor Drives* is a long-awaited comprehensive overview of power electronic converters for permanent magnet synchronous machines and control strategies for variable-speed operation. It introduces machines, power devices, inverters, and control, and addresses modeling, implementation, control strategies, and flux weakening operations, as well as parameter sensitivity, and rotor position sensorless control. Suitable for both industrial and academic audiences, this book also covers the simulation, low cost inverter topologies, and commutation torque ripple of PM brushless DC motor drives. Simulation of the motor drives system is illustrated with MATLAB® codes in the

text. This book is divided into three parts—fundamentals of PM synchronous and brushless dc machines, power devices, inverters; PM synchronous motor drives, and brushless dc motor drives. With regard to the power electronics associated with these drive systems, the author: Explores use of the standard three-phase bridge inverter for driving the machine, power factor correction, and inverter control Introduces space vector modulation step by step and contrasts with PWM Details dead time effects in the inverter, and its compensation Discusses new power converter topologies being considered for low-cost drive systems in PM brushless DC motor drives This reference is dedicated exclusively to PM ac machines, with a timely emphasis on control and standard, and low-cost converter topologies. Widely used for teaching at the doctoral level and for industrial audiences both in the U.S. and abroad, it will be a welcome addition to any engineer's library.

#### **Brushless Permanent-magnet and Reluctance Motor Drives**

T. J. E. Miller 1989 A presentation of the theory of brushless d.c. drives to help engineers appreciate the potential of such motors and apply them more widely, by taking into account developments in permanent-magnet materials, power semiconductors, electronic control and motor design.

*Parameter Estimation, Condition Monitoring, and Diagnosis of Electrical Machines* Peter Vas 1993 Condition monitoring of electrical machines and drive systems is a vital factor to achieve efficient and profitable operation of a large variety of industrial processes. Similarly, parameter estimation is important for the machine designer, and invaluable to the operator of modern drives implementing various types of controllers. It is also necessary to know the machine parameters for a number of simulation purposes. The chapters in this volume cover recent trends and advances in these and other areas, including sections on on-line and off-line parameter estimation of smooth-air-gap and salient-pole electrical machines, their diagnosis, and condition monitoring. New real-time monitoring devices,

vibroacoustic techniques, and the symptoms and possible causes of failures of electrical machines are also discussed. In the book a unified and in-depth physical and mathematical analysis of the various parameter estimators and condition monitoring methods is presented. For this purpose, where possible, space phasor theory is utilized and the most recent and modern developments in the field are incorporated. The book is intended for academic and professional electrical engineers, and all those responsible for the performance, maintenance, and design of electrical machines and drive systems.

**Proceedings of the 6th International Conference and Exhibition on Sustainable Energy and Advanced Materials**

Ubaidillah Sabino 2020-06-01 This book gathers the proceedings of the 6th International Conference and Exhibition on Sustainable Energy and Advanced Materials (ICE-SEAM 2019), held on 16-17 October 2019 in Surakarta, Indonesia. It focuses on two relatively broad areas - advanced materials and sustainable energy - and a diverse range of subtopics: Advanced Materials and Related Technologies: Liquid Crystals, Semiconductors, Superconductors, Optics, Lasers, Sensors, Mesoporous Materials, Nanomaterials, Smart Ferrous Materials, Amorphous Materials, Crystalline Materials, Biomaterials, Metamaterials, Composites, Polymers, Design, Analysis, Development, Manufacturing, Processing and Testing for Advanced Materials. Sustainable Energy and Related Technologies: Energy Management, Storage, Conservation, Industrial Energy Efficiency, Energy-Efficient Buildings, Energy-Efficient Traffic Systems, Energy Distribution, Energy Modeling, Hybrid and Integrated Energy Systems, Fossil Energy, Nuclear Energy, Bioenergy, Biogas, Biomass Geothermal Power, Non-Fossil Energies, Wind Energy, Hydropower, Solar Photovoltaic, Fuel Cells, Electrification, and Electrical Power Systems and Controls.

**Wind Energy Systems for Electric Power Generation**

Manfred Stiebler 2008-08-19 Among renewable sources wind power systems have developed to prominent s- pliers of

electrical energy. Since the 1980s they have seen an exponential increase, both in unit power ratings and overall capacity. While most of the systems are found on dry land, preferably in coastal regions, off-shore wind parks are expected to add significantly to wind energy conversion in the future. The theory of modern wind turbines has not been established before the 20th century. Currently wind turbines with three blades and horizontal shaft prevail. The driven electric generators are of the asynchronous or synchronous type, without interposed gearbox. Modern systems are designed for variable speed operation which make power electronic devices play an important part in wind energy conversion. Manufacturing has reached the state of a high-tech industry. Countries prominent for the amount of installed wind turbine systems feeding into the grid are in Europe Denmark, Germany and Spain. Outside Europe it is the United States of America and India who stand out with large rates of increase. The market and the degree of contribution to the energy consumption in a country has been strongly influenced by National support schemes, such as guaranteed feed-in tariffs or tax credits. Due to the personal background of the author, the view is mainly directed on Europe, and many examples are taken from the German scene. However, the situation in other continents, especially North America and Asia is also considered.

*Brushless Permanent Magnet Motor Design* Duane C. Hanselman 2006-01-01

*Axial Flux Permanent Magnet Brushless Machines* Jacek F. Gieras 2006-01-16 Axial Flux Permanent Magnet (AFPM) brushless machines are modern electrical machines with a lot of advantageous merits over their conventional counterparts. They are increasingly used in power generation, domestic appliances, industrial drives, electric vehicles, and marine propulsion drives and many other applications. This book deals with the analysis, construction, design, optimisation, control and applications of AFPM machines. The authors present their own research results, as well as significant research

contributions made by others. This monograph will be of interest to electrical engineers and other engineers involved in the design and application of AFPM brushless machine drives. It will be an important resource for researchers and graduate students in the field of electrical machine and drives.

**Electric Vehicle Machines and Drives** K. T. Chau

2015-05-13 A timely comprehensive reference consolidates the research and development of electric vehicle machines and drives for electric and hybrid propulsions

- Focuses on electric vehicle machines and drives
- Covers the major technologies in the area including fundamental concepts and applications
- Emphasizes the design criteria, performance analyses and application examples or potentials of various motor drives and machine systems
- Accompanying website includes the simulation models and outcomes as supplementary material

*Solar Cell Array Design Handbook* Hans S. Rauschenbach  
2012-12-06

**Mechanical Design of Electric Motors** Wei Tong 2014-04-28

Rapid increases in energy consumption and emphasis on environmental protection have posed challenges for the motor industry, as has the design and manufacture of highly efficient, reliable, cost-effective, energy-saving, quiet, precisely controlled, and long-lasting electric motors. Suitable for motor designers, engineers, and manufacturers, as well

**Power Electronics and Renewable Energy Systems** C.

Kamalakaran 2014-11-19 The book is a collection of high-quality peer-reviewed research papers presented in the Proceedings of International Conference on Power Electronics and Renewable Energy Systems (ICPERES 2014) held at Rajalakshmi Engineering College, Chennai, India. These research papers provide the latest developments in the broad area of Power Electronics and Renewable Energy. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.

Hybrid Electric Power Train Engineering and Technology: Modeling, Control, and Simulation Szumanowski, Antoni  
2013-05-31 Hybridization is an increasingly popular paradigm in the auto industry, but one that is not fully understood by car manufacturers. In general, hybrid electric vehicles (HEV) are designed without regard to the mechanics of the power train, which is developed similarly to its counterparts in internal combustion engines. Hybrid Electric Power Train Engineering and Technology: Modeling, Control, and Simulation provides readers with an academic investigation into HEV power train design using mathematical modeling and simulation of various hybrid electric motors and control systems. This book explores the construction of the most energy efficient power trains, which is of importance to designers, manufacturers, and students of mechanical engineering. This book is part of the Research Essentials collection.

*Motor design for maximum material exploitation and magnetization procedure with in-line quality check for mass production* Dinca, Christian 2017-03-09 To reduce the amount of Rare-earth Elements in high efficient permanent magnet electric motors, the magnetic stray flux has to be reduced. Additionally, a temperature reduction inside the motor reduces the necessary amount of the so called Heavy Rare-earth Elements, which account for the bulk part of the magnet material costs. In this thesis a permanent magnet motor in wet rotor configuration for an automotive application is designed. It was shown that by simple thermal improvements of the electric insulation system the maximum temperature of the stator can be reduced. Extensive measurements on different combinations of insulation material of the stator and the development of a new thermal model for orthocyclic wound stators were performed. Due to the use of fiber cans eddy current losses could be eliminated and the stray flux minimized. In a second stage a magnetizing fixture was build up, which is able to magnetize the buried magnets inside the rotor. The rotor and the magnetizing fixture was developed, so that the

magnets can be optimal magnetized. To check the quality of the magnets the magnetizing coil was developed in a way, such that the hysteresis curve of every single magnet during magnetization can be measured. Different magnets were tested and ways to calculate parasitics are given. Um die Menge an Selten Erden in hoch-effizienten permanent erregten Elektromotoren zu reduzieren, muss der magnetische Streufluss verringert werden. Eine Temperaturreduktion im Motor verringert zudem die nötige Menge an so genannten schweren Selten Erden, welche einen Großteil der Kosten der Magnetmaterialien ausmachen. In dieser Arbeit wird dazu ein permanent erregter Nassläufer für eine automotiv Anwendung ausgelegt. Es konnte gezeigt werden, dass durch einfache Maßnahmen im Bereich der elektrischen Isolation die maximale Temperatur im Stator reduziert werden konnte. Umfangreiche Messungen an verschiedenen Kombinationen von elektrischen Isolationen des Stators und die Entwicklung eines neuen thermischen Modells für orthozyklisch gewickelte Statoren wurden getätigt. Durch Einsatz von Spaltrohren aus Faserverbundwerkstoffen konnten die Wirbelstromverluste beseitigt werden und der Streufluss minimiert werden. In einem zweiten Schritt wurde eine Magnetisiervorrichtung aufgebaut, mit der die zu Anfang unmagnetisierten eingebetteten Magneten im Rotor aufmagnetisiert werden konnten. Der Rotor wurde zudem zusammen mit der Magnetisierungsspule so ausgelegt, dass die Magnete optimal magnetisiert werden können. Um die Qualität der Magnete zu testen wurde die Magnetisierspule zudem so ausgelegt, dass eine Messung der Hystereseurve jedes einzelnen Magneten während der Magnetisierung möglich ist. Verschiedene Magnete wurden vermessen und Möglichkeiten zur Bestimmung von parasitären Effekten gegeben.

#### **Modern Electric, Hybrid Electric, and Fuel Cell**

**Vehicles, Third Edition** Mehrdad Ehsani 2018-02-02 The book deals with the fundamentals, theoretical bases, and design methodologies of conventional internal combustion engine (ICE) vehicles, electric vehicles (EVs), hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs).

The design methodology is described in mathematical terms, step-by-step, and the topics are approached from the overall drive train system, not just individual components. Furthermore, in explaining the design methodology of each drive train, design examples are presented with simulation results.

Brushless Motors Duane Hanselman 2012-07-01 Brushless Motors: Magnetic Design, Performance and Control is an outgrowth of the author's two previous books on this subject. This book contains significant additional material covering further aspects of magnetic design, performance, and electrical control. The primary goal of this book is to meet the needs of working engineers who have little or no experience in electric motor design and control. The book starts with basic concepts, provides intuitive reasoning for them, and gradually builds a set of understandable concepts that foster the development of usable knowledge. This book strives to provide a basis of knowledge that non-experts can use to develop practical expertise, making them more productive in their work and allowing them to productively explore other approaches to motor design, performance, and electrical control.

Recent Developments of Electrical Drives Slawomir Wiak 2007-06-08 This book presents papers covering a wide spectrum of theory and practice, deeply rooted in engineering problems at a high practical and theoretical level. The contents explore theory, control systems and applications, the heart of the matter in electrical drives.

Electrical Machines Jacek F. Gieras 2016-10-14 This book endeavors to break the stereotype that basic electrical machine courses are limited only to transformers, DC brush machines, induction machines, and wound-field synchronous machines. It is intended to serve as a textbook for basic courses on Electrical Machines covering the fundamentals of the electromechanical energy conversion, transformers, classical electrical machines, i.e., DC brush machines, induction machines, wound-field rotor synchronous machines and modern

electrical machines, i.e., switched reluctance machines (SRM) and permanent magnet (PM) brushless machines. In addition to academic research and teaching, the author has worked for over 18 years in US high-technology corporative businesses providing solutions to problems such as design, simulation, manufacturing and laboratory testing of large variety of electrical machines for electric traction, energy generation, marine propulsion, and aerospace electric systems.

Symmetry in Mechanical Engineering Adam Glowacz

2020-06-03 Recent advancements in mechanical engineering are an essential topic for discussion. The topics relating to mechanical engineering include the following: measurements of signals of shafts, springs, belts, bearings, gears, rotors, machine elements, vibration analysis, acoustic analysis, fault diagnosis, construction, analysis of machine operation, analysis of smart-material systems, integrated systems, stresses, analysis of deformations, analysis of mechanical properties, signal processing of mechanical systems, and rotor dynamics. Mechanical engineering deals with solid and fluid mechanics, rotation, movements, materials, and thermodynamics. This book, with 15 published articles, presents the topic "Symmetry in Mechanical Engineering". The presented topic is interesting. It is categorized into eight different sections: Deformation; Stresses; Mechanical properties; Tribology; Thermodynamic; Measurement; Fault diagnosis; Machine. The development of techniques and methods related to mechanical engineering is growing every month. The described articles have made a contribution to mechanical engineering. The proposed research can find applications in factories, oil refineries, and mines. It is essential to develop new improved methods, techniques, and devices related to mechanical engineering.

**Design of Rotating Electrical Machines** Juha Pyrhonen

2013-09-26 In one complete volume, this essential reference presents an in-depth overview of the theoretical principles and techniques of electrical machine design. This timely new edition offers up-to-date theory and guidelines for the design of electrical machines, taking into account recent advances in permanent magnet machines as well as synchronous reluctance machines. New coverage includes: Brand new material on the ecological impact of the motors, covering the eco-design principles of rotating electrical machines An expanded section on the design of permanent magnet synchronous machines, now reporting on the design of tooth-coil, high-torque permanent magnet machines and their properties Large updates and new material on synchronous reluctance machines, air-gap inductance, losses in and resistivity of permanent magnets (PM), operating point of loaded PM circuit, PM machine design, and minimizing the losses in electrical machines> End-of-chapter exercises and new direct design examples with methods and solutions to real design problems> A supplementary website hosts two machine design examples created with MATHCAD: rotor surface magnet permanent magnet machine and squirrel cage induction machine calculations. Also a MATLAB code for optimizing the design of an induction motor is provided Outlining a step-by-step sequence of machine design, this book enables electrical machine designers to design rotating electrical machines. With a thorough treatment of all existing and emerging technologies in the field, it is a useful manual for professionals working in the diagnosis of electrical machines and drives. A rigorous introduction to the theoretical principles and techniques makes the book invaluable to senior electrical engineering students, postgraduates, researchers and university lecturers involved in electrical drives technology and electromechanical energy conversion.