

## Fundamentals Of Electrical Drives By Gk Dubey Ebooks Download

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Fundamentals of Electrical Drives A First Course on Electrical Drives Control of Electrical Drives Electrical Machine Drives Control Basics of Electrical Drives Fundamentals of Electrical Drives Electrical Drives Advanced Electrical Drives Power Semiconductor Drives Fundamentals of Electrical Drives Fundamentals of Electric Drives PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink ELECTRIC DRIVES Advanced Control of Electrical Drives and Power Electronic Converters Control in Power Electronics and Electrical Drives Dynamics of Electric Drives Electrical Drives for Direct Drive Renewable Energy Systems Control of Electrical Drives Electric Drives and Their Controls Modern Electrical Drives *DUBEY GOPAL K S. K. Pillai Werner Leonhard Juha Pyrhonen Sivan Kumaraswami Pillai Gopal K. Dubey Jens Weidauer Rik De Doncker S. Sivanagaraju André Veltman Mohamed A. El-Sharkawi Liuping Wang N. K. DW Jacek Kabziński R. Zwicky Ishwar Singh Markus Mueller Werner Leonhard Richard M. Crowder H. Bülent Ertan*

encouraged by the response to the first edition and to keep pace with recent developments fundamentals of electrical drives second edition incorporates greater details on semiconductor controlled drives includes coverage of permanent magnet ac motor drives and switched reluctance motor drives and highlights new trends in drive technology contents were chosen to satisfy the changing needs of the industry and provide the appropriate coverage of modern and conventional drives with the large number of examples problems and solutions provided fundamentals of electrical drives second edition will continue to be a useful reference for practicing engineers and for those preparing for engineering service examinations

the aim of revision is mainly to acquaint the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dc motors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated the drives used in the fast growing petroleum industry have been included in the chapter on industrial applications

electrical drives play an important role as electromechanical energy converters in transportation material handling and most production processes the ease of controlling electrical drives is an important aspect for meeting the increasing demands by the user with respect to flexibility and precision caused by technological progress in industry as well as the need for energy conservation at the same time the control of electrical drives has provided strong incentives to control engineering in general leading to the development of new control structures and their introduction to other areas of control this is due to the stringent operating conditions and widely varying specifications a drive may alternately require control of torque acceleration speed or position and the fact that most electric drives have in contrast to chemical or thermal processes well defined structures and consistent dynamic characteristics during the last years the field of controlled electrical drives has undergone rapid expansion due mainly to the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics eventually culminating in microelectronics and microprocessors the introduction of electronically switched solid state power converters has renewed the search for adjustable speed ac motor drives not subject to the limitations of the mechanical commutator of dc drives which dominated the field for a century

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

in this book fundamentals of electrical drives are discussed keeping in mind the students of electrical engineering dynamics of electrical drives characteristics of dc and ac

motors while starting running and braking determination of rating and heating of motors are described in detail drives used in various industries are discussed in a separate chapter industrial applications solved examples and problems are given at the end of most of the chapters the book acquaints the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dc motors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated amazon in

suitable for undergraduate and postgraduate courses in electrical drives this book covers topics on dynamics and control of electrical drives selection of motor power rating dc induction and synchronous motor drives stepper motor and switched reluctance motor drives permanent magnet ac and brushless dc motor drives and more

from the point of view of a user this book covers all aspects of modern electrical drives it is aimed at both users who wish to understand design use and maintain electrical drives as well as specialists technicians engineers and students who wish to gain a comprehensive overview of electrical drives jens weidauer and richard messer describe the principles of electrical drives their design and application through to complex automation solutions in the process they introduce the entire spectrum of drive solutions available and their main applications a special aspect is the combination of multiple drives to form a drive system as well as the integration of drives into automation solutions in simple and clear language and supported with many diagrams complex relationships are described and presented in an easy to understand way the authors deliberately avoid a comprehensive mathematical treatment of their subject and instead focus on a coherent description of the active principles and relationships as a result the reader will be in a position to understand electrical drives as a whole and to solve drive related problems in everyday professional life

electrical drives convert in a controlled manner electrical energy into mechanical energy electrical drives comprise an electrical machine i e an electro mechanical energy converter a power electronic converter i e an electrical to electrical converter and a controller communication unit today electrical drives are used as propulsion systems in high speed trains elevators escalators electric ships electric forklift trucks and electric vehicles advanced control algorithms mostly digitally implemented allow torque control over a high bandwidth hence precise motion control can be achieved examples are drives in robots pick and place machines factory automation hardware etc most drives can operate in motoring and generating mode wind turbines use electrical drives to convert wind energy into electrical energy more and more variable speed drives are used to save energy for example in air conditioning units compressors blowers pumps and home appliances key to ensure stable operation of a drive in the aforementioned applications are torque control algorithms in advanced electrical drives a unique approach is followed to derive model based torque controllers for all types of lorentz force machines i e dc synchronous and induction machines the rotating transformer model forms the basis for this generalized modeling approach that ultimately leads to the development of universal field oriented control algorithms in case of switched reluctance machines torque observers are proposed to implement direct torque algorithms from a didactic viewpoint tutorials are included

at the end of each chapter the reader is encouraged to execute these tutorials to familiarize him or herself with all aspects of drive technology hence advanced electrical drives encourages learning by doing furthermore the experienced drive specialist may find the simulation tools useful to design high performance controllers for all sorts of electrical drives

the book is primarily intended for b e b tech students of electrical engineering electrical and electronics engineering having courses in electric drives power semiconductor drives it will also be highly useful for m e m tech students of these disciplines specializing in power electronics industrial drives electric drives the text is divided into eight chapters the first two chapters cover the control of dc motors by using various kinds of converters the third chapter focuses on dual converters and various braking techniques chopper control fed dc motors are discussed in the fourth chapter the next three chapters are devoted to control methods for induction motors the eighth chapter deals with the control of synchronous motor drives fed from vsi converters and cycloconverters

electrical drives in general play a key role in power generation household appliances automotive and industrial applications the rapidly expanding area of adjustable speed drives as used in robotics wind turbines and hybrid vehicles is driven by innovations in machine design power semi conductors digital signal processors and simulation software fundamentals of electrical drives is for readers with a basic engineering knowledge who have a need or desire to comprehend and apply the theory and simulation methods which are applied by drive specialist throughout the world

this text fills a need for a textbook that presents the basic topics and fundamental concepts underlying electric machines power electronics and electric drives for electrical engineering students at the undergraduate level most existing books on electric drives concentrate either on converters and waveform analysis ignoring mechanical load dynamics or on motor characteristics giving short shrift to analysis of converters and controllers this book provides a complete overview of the subject at the right level for ee students the book takes readers through the analysis and design of a complete electric drives system including coverage of mechanical loads motors converters sensing and controllers in addition to serving as a text this book serves as a useful and practical reference for professional electric drives engineers

a timely introduction to current research on pid and predictive control by one of the leading authors on the subject pid and predictive control of electric drives and power supplies using matlab simulink examines the classical control system strategies such as pid control feed forward control and cascade control which are widely used in current practice the authors share their experiences in actual design and implementation of the control systems on laboratory test beds taking the reader from the fundamentals through to more sophisticated design and analysis the book contains sections on closed loop performance analysis in both frequency domain and time domain presented to help the designer in selection of controller parameters and validation of the control system continuous time model predictive control systems are designed for the drives and power

supplies and operational constraints are imposed in the design discrete time model predictive control systems are designed based on the discretization of the physical models which will appeal to readers who are more familiar with sampled data control system soft sensors and observers will be discussed for low cost implementation resonant control of the electric drives and power supply will be discussed to deal with the problems of bias in sensors and unbalanced three phase ac currents brings together both classical control systems and predictive control systems in a logical style from introductory through to advanced levels demonstrates how simulation and experimental results are used to support theoretical analysis and the proposed design algorithms matlab and simulink tutorials are given in each chapter to show the readers how to take the theory to applications includes matlab and simulink software using xpc target for teaching purposes a companion website is available researchers and industrial engineers and graduate students on electrical engineering courses will find this a valuable resource

this book provides a comprehensive introduction to the fundamental concepts of electric drives and is eminently suited as a textbook for b e b tech amie and diploma courses in electrical engineering it can also be used most effectively by all those preparing for gate and upsc competitive examinations as well as by practising engineers the topics which range from principles and techniques to industrial applications include characteristic features of drives methods of braking and speed control electromagnetic and solid state control of motors motor ratings transients in drive systems and operation of stepper motors

this contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering linking control theory power electronics artificial neural networks embedded controllers and signal processing the authors of each chapter report the state of the art of the various topics addressed and present results of their own research laboratory experiments and successful applications the presented solutions concentrate on three main areas of interest motion control in complex electromechanical systems including sensorless control fault diagnosis and fault tolerant control of electric drives new control algorithms for power electronics converters the chapters and the complete book possess strong monograph attributes important practical and theoretical problems are deeply and accurately presented on the background of an exhaustive state of the art review many results are completely new and were never published before well known control methods like field oriented control foc or direct torque control dtc are referred as a starting point for modifications or are used for comparison among numerous control theories used to solve particular problems are nonlinear control robust control adaptive control lyapunov techniques observer design model predictive control neural control sliding mode control signal filtration and processing fault diagnosis and fault tolerant control

contains 97 papers which provide a valuable overview of the latest technical innovations in this rapidly expanding field areas of development which receive particular attention include the emergence of power switching transistors the application of microprocessors to regulation and control of static converters and electrical drives the use of more sophisticated control strategies and the utilization of power electronics in new application fields

electric drives lie at the heart of modern engineering powering a vast array of applications ranging from industrial machinery and transportation systems to renewable energy technologies as the world embraces electrification and automation the demand for understanding the dynamics of electric drives has never been more pressing it is within this context that dynamics of electric drives emerges as a comprehensive guide aimed at elucidating the principles dynamics and applications of electric drive systems

wind turbine gearboxes present major reliability issues leading to great interest in the current development of gearless direct drive wind energy systems offering high reliability high efficiency and low maintenance developments in these direct drive systems point the way to the next generation of wind power and electrical drives for direct drive renewable energy systems is an authoritative guide to their design development and operation part one outlines electrical drive technology beginning with an overview of electrical generators for direct drive systems principles of electrical design for permanent magnet generators are discussed followed by electrical thermal and structural generator design and systems integration a review of power electronic converter technology and power electronic converter systems for direct drive renewable energy applications is then conducted part two then focuses on wind and marine applications beginning with a commercial overview of wind turbine drive systems and an introduction to direct drive wave energy conversion systems the commercial application of these technologies is investigated via case studies on the permanent magnet direct drive generator in the zephyros wind turbine and the archimedes wave swing aws direct drive wave energy pilot plant finally the book concludes by exploring the application of high temperature superconducting machines to direct drive renewable energy systems with its distinguished editors and international team of expert contributors electrical drives for direct drive renewable energy systems provides a comprehensive review of key technologies for anyone involved with or interested in the design construction operation development and optimisation of direct drive wind and marine energy systems an authoritative guide to the design development and operation of gearless direct drives discusses the principles of electrical design for permanent magnet generators and electrical thermal and structural generator design and systems integration investigates the commercial applications of wind turbine drive systems

electrical drives play an important role as electromechanical energy converters in transportation and most production processes the ease of controlling electrical drives is an important aspect for meeting the increasing demands by the user with respect to flexibility and precision caused by technological progress in industry conversely the control of electrical drives has in the past provided strong incentives to control engineering in general leading to the development of new other areas of control this is due to control structures and their introduction to stringent operating conditions and widely varying specifications a drive may alternately require control of torque acceleration speed or position and the fact that most electric drives have in contrast to chemical or thermal processes well defined structures and consistent dynamic characteristics during the last few years the field of controlled electrical drives has experienced rapid expansion caused mainly by the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics eventually culminating in microelectronics and microprocessors the introduction of electronically switched solid state power converters

has renewed the search for ac motor drives not subject to the limitations of the mechanical commutator of dc drives this has created new and difficult control problems

this work explains how to size select and implement an industrial drive system the author offers a practical but structured approach which places particular emphasis on smaller drive systems examples are given from the machine tool and robotics industries

electrical drives lie at the heart of most industrial processes and make a major contribution to the comfort and high quality products we all take for granted they provide the controller power needed at all levels from megawatts in cement production to milliwatts in wrist watches other examples are legion from the domestic kitchen to public utilities the modern electrical drive is a complex item comprising a controller a static converter and an electrical motor some can be programmed by the user some can communicate with other drives semiconductor switches have improved intelligent power modules have been introduced all of which means that control techniques can be used now that were unimaginable a decade ago nor has the motor side stood still high energy permanent magnets semiconductor switched reluctance motors silicon micromotor technology and soft magnetic materials produced by powder technology are all revolutionising the industry but the electric drive is an enabling technology so the revolution is rippling throughout the whole of industry

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