



Control of Induction Motors

By Andrzej M. Trzynadlowski

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This book is a comprehensive reference source for practicing engineers and students specializing in electric power engineering and industrial electronics. It will illustrate the state of the art in induction motors. Beginning with characteristics and basic dynamic models of induction motors, and progressing to low- and high- performance drive systems. The book will be rich in useful information, without an excessive mathematical burden. Computer simulations resulting in mock oscillograms of physical quantities are used for illustration of basic control concepts. The content of this book is divided into three basic parts: 1) control-oriented description of induction motors, 2) control methods, and systems, 3) control means. An induction motor is presented as an electromechanical power converter, and basic relations between the electrical, magnetic and mechanical quantities in the motor will be explained. Control methods and systems will be classified according to the controlled variables(torque, speed, flux), actuating variables(voltage, current), and dynamic performance (uncontrolled, low-performance, and high-performance). An overview of power electronic converters and information processing equipment used in the modern induction motor drives is included. Such systematic approach will give the readers a comprehensive overview of the field of induction motor control.

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Editorial Review

Review

"...a valuable resource...clear to those who are not experts in the field...an excellent reference for practicing engineers, including electrical, mechanical, and industrial engineers. The author's extensive experience clearly shows in the content."

--Choice, October 2001

From the Back Cover

More than half of the total energy produced in developed countries is consumed by electric motors or, more precisely, converted into mechanical energy, freeing society from the tedious burden of physical labor. Among the many types of motors, induction machines still have the unparalleled popularity they did a century ago. At least 90% of industrial drive systems employ induction motors.

Most of the motors are uncontrolled, but the share of adjustable speed induction motor drives fed from power electronic converters is steadily increasing, phasing out dc drives. It is estimated that more than \$50 billion could be saved annually by replacing all "dumb" motors with controlled ones.

This book is devoted to various aspects of control of induction motors. In contrast to existing books on adjustable speed drives, a great effort has been made to make the covered topics easy to understand by nonspecialists. Although primarily written for professional electrical, mechanical, and industrial engineers, the book will be an essential graduate textbook and also an undergraduate reference source.

This book is a comprehensive reference source for practicing engineers and students specializing in electric power engineering and industrial electronics. It illustrates the state of the art in induction motors, beginning with characteristics and basic dynamic models of induction motors, and progressing to low- and high-performance drive systems.

About the Author

Andrzej Trzynadlowski is a Professor of Electrical Engineering at the University of Nevada, Reno. He is a senior member of the IEEE and a member of the Industrial Drives and Industrial Power Converters Committee of the IEEE Industrial Applications Society. He is the author of over 80 publications in the areas of power electronics and electric drive systems and has been granted 11 patents.

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Leslie Marcellus:

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