Noise and Vibration of Electrical Machines

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Originally published in the Hungarian language, and now available in English, the 18 chapters of this book are divided into three main topics: the generation and elimination of noise and vibration, experimental investigations of noise and vibration phenomena, and practical applications of vibroacoustic methods in the testing of rotating electrical machines. This is a systematic study summarizing currently-available knowledge of the vibroacoustic effects accompanying the energy conversion of electrical machines. This book deals with the acoustics of electrical machines in detail, presenting both the theoretical and the practical aspects of the generation of mechanical and magnetic noise by electrical machines. Beginning with a detailed field analysis used in the computation of the noise of electromagnetic origin in rotating electrical machines, the authors discuss the noise of inverter-fed asynchronous motors and the influence of loading. The book then deals with the noise of transformers and high voltage power lines. The second part of the book is devoted to vibroacoustical measurements. In addition to steady-state noise level data, the authors present practical analog and digital methods for measuring the noise characteristics of the machines in transient modes of operation and when generating impulsive sounds. This book is useful for engineers, designers, students and others who are concerned with the noise and vibration control of electrical machines.