



Noise of Polyphase Electric Motors (Electrical and Computer Engineering)

By Jacek F. Gieras, Chong Wang, Joseph Cho Lai

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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.

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- Sales Rank: #2294483 in Books
- Published on: 2005-12-12
- Original language: English
- Number of items: 1
- Dimensions: 1.05" h x 6.90" w x 9.34" l, 1.46 pounds
- Binding: Hardcover
- 392 pages

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Editorial Review

Review

The presented book has a strong monograph attributes and the description of technical material is in the form of tutorials and technology overviews, combining fundamentals and advanced material. ...The book is an attractive reference book for research, consulting and development engineers who are interested in design of modern electrical machines. Also, it can be used for advanced senior-level course as well as partially in undergraduate course in university.

-IEEE Industrial Electronics Society Newsletter, Vol. 54, No. 2, June 2006

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