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Introduction to Rotordynamics -- Fundamentals of Magnetic Bearings -- Design of AMB-supported Centrifugal Compressor -- Derivation of the Surge Dynamic Equations -- Control Design for AMB Suspension -- Control Design for Compressor Surge.

Control of Surge in Centrifugal Compressors by Active Magnetic Bearings sets out the fundamentals of integrating the active magnetic bearing (AMB) rotor suspension technology in compressor systems, and describes how this relatively new bearing technology can be employed in the active control of compressor surge. The authors provide a selfcontained and comprehensive review of rotordynamics and the fundamentals of the AMB technology. The active stabilization of compressor surge employing AMBs in a machine is fully explored, from the modeling of the instability and the design of feedback controllers, to the implementation and experimental testing of the control algorithms in a specially-constructed, industrial-size centrifugal compression system. The results of these tests demonstrate the great potential of the new surge control method developed in this text. This book will be useful for engineers in industries that involve turbocompressors and magnetic bearings, as well as for researchers and graduate students in the field of applied control. Whatever their level of experience, engineers working in the fields of turbomachinery. magnetic bearings, rotordynamics and controls will find the material in this book absorbing as all these important aspects of engineering are integrated to create a multi-disciplinary solution to a real-life industrial problem. Newcomers to the above mentioned industrial fields will also find this book to be a suitable introduction to the basic concepts required for understanding the AMB technology, and its applications in the stabilization of compressor flow. Advances in Industrial Control aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.