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Nota di contenuto	Title Page ; Copyright; Contents; List of contributors; Preface; Chapter 1 Introduction; 1.1 Introduction to the book; 1.2 Traction applications; 1.3 Electric drives for traction applications; 1.3.1 General description; 1.3.2 Different electric drive configurations; 1.4 Classification of different parts of electric drives: converter, machines, control strategies, and energy sources; 1.4.1 Converters; 1.4.2 Machines; 1.4.3 Control strategies; 1.4.4 AC and DC voltage sources; 1.5 Future challenges for electric drives; 1.6 Historical evolution; References; Chapter 2 Control of induction machines 2.1 Introduction 2.2 Modeling of induction motors; 2.2.1 Dynamic model of the induction motor using three-phase variables; 2.2.2 Basics of space vector theory; 2.2.3 Dynamic model of the induction machine using complex space vectors; 2.2.4 Dynamic model in the stationary reference frame; 2.2.5 Dynamic models in a synchronous reference frame; 2.2.6 Torque and power equations; 2.3 Rotor flux oriented vector control; 2.3.1 Fundamentals of rotor flux oriented control; 2.3.2 The stator voltage equation; 2.3.3 Synchronous current regulators; 2.3.4 Rotor flux estimation 2.4 Torque capability of the induction machine 2.4.1 Constant torque region; 2.4.2 Flux-weakening region I (constant power region); 2.4.3

Flux-weakening region II (constant  $T_{em2}$ ); 2.5 Rotor flux selection; 2.5.1 Rotor flux reference selection below rated speed; 2.5.2 Accurate criteria for flux reference generation; 2.5.3 Feedback based field weakening; 2.6 Outer control loops; 2.6.1 Speed control; 2.6.2 Rotor flux control loop; 2.7 Sensorless control; 2.7.1 Sensorless control of induction machines using model-based methods; 2.7.2 Sensorless control using saliency-tracking-based methods

2.8 Steady-state equations and limits of operation of the induction machine

2.8.1 Calculation of the maximum capability curves; 2.8.2 Calculation of the steady-state operation; References; Chapter 3 Control of synchronous machines ; 3.1 Introduction; 3.2 Types of synchronous machines; 3.3 Modeling of synchronous machines; 3.3.1 Dynamic models of synchronous machines using three-phase variables; 3.3.2 Dynamic model of synchronous machines in the stationary reference frame using complex space vectors; 3.3.3 Dynamic model of synchronous machines in the synchronous reference frame

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3.4.1 Surface permanent magnet synchronous machine (non-salient machines); 3.4.2 Interior permanent magnet synchronous machine (salient machines with magnets); 3.4.3 Synchronous reluctance machines (salient machines without magnets); 3.4.4 Maximum torque per ampere (MTPA) in interior permanent magnet machines; 3.5 Vector control of permanent magnet synchronous machines; 3.5.1 Vector control of non-salient synchronous machines; 3.5.2 Vector control of salient synchronous machines; 3.5.3 Synchronous current regulators

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