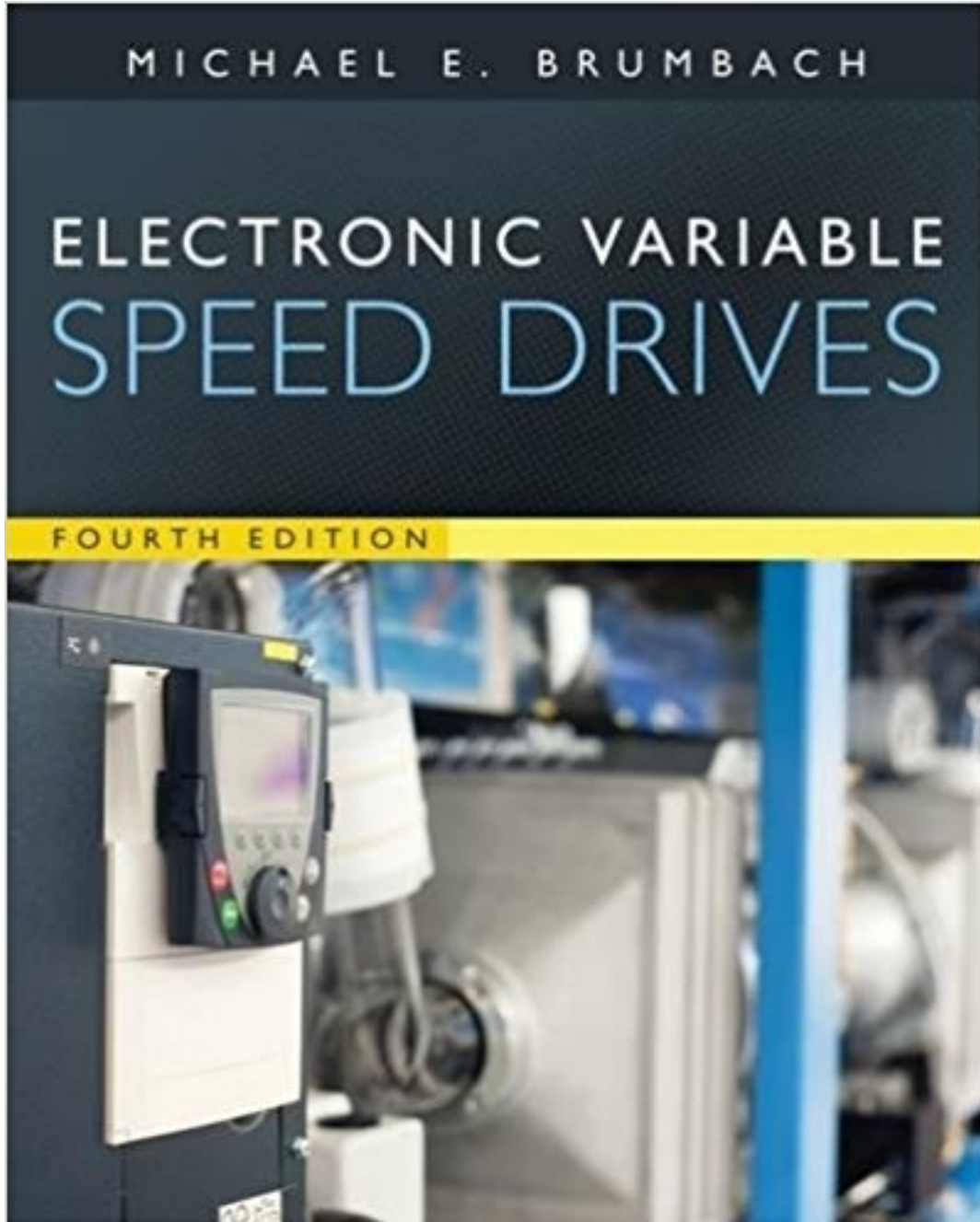


Solutions for Electronic Variable Speed Drives 4th Edition by Brumbach

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Solutions

REVIEW QUESTIONS for CHAPTER 1

1. What are the two speeds that are associated with an induction motor?
A. *Synchronous speed and rotor speed.*
2. Explain the difference between the two speeds associated with an induction motor.
A. *Synchronous speed is the speed at which the rotating magnetic field revolves around the stator. Rotor speed is the speed at which the rotor rotates.*
3. What two factors determine the speed at which the magnetic field revolves around the stator of an induction motor?
A. *The number of stator poles within the motor and the frequency of the applied AC power.*
4. Explain the term “slip.”
A. *The difference between the rotor speed and the synchronous speed is called slip.*
5. Is slip desirable or undesirable? Why?
A. *Slip is desirable. Slip is what produces torque in a motor. And as slip increases, torque increases. Without slip, torque would not be produced and the motor would be useless.*
6. Prior to the advent of VFDs, name four methods of speed control.
A. *Pulleys, belts, sprockets, chains, gearboxes, mechanical brakes, wound-rotor induction motor, DC motor prime mover for an alternator to vary the frequency of the AC, and the VFD.*
7. Name three basic types of VFDs.
A. *Pulse-width-modulated (PWM), current-source-inverters (CSI), and voltage-source-inverters (VSI).*
8. What is the name of the section of the VFD that is connected to the three-phase power source? Describe its function.
A. *The converter stage. The converter stage accepts three-phase power and rectifies the three-phase AC into direct current or DC.*
9. What are three names for the section of a VFD that produces a smooth DC?
A. *Filter stage, DC link, or DC bus.*
10. What is the name of the section of the VFD that is connected to the motor? Describe its function.
A. *The inverter stage. The inverter stage switches the DC on and off at a very high rate. This causes the DC to appear as pulses that simulate alternating current or AC.*

REVIEW QUESTIONS for CHAPTER 2

1. Explain the difference between mass and weight.
A. *Mass is the amount of matter contained within an object. The weight of an object is the result of the force that gravity exerts on an object.*
2. Explain the difference between speed and velocity.
A. *Speed is the rate of motion (how far an object moves within a specified amount of time). Velocity denotes not only the rate of motion, but the direction of the motion.*