

FIGURE 3.1

The diode symbol (a) and its ideal characteristic (b).

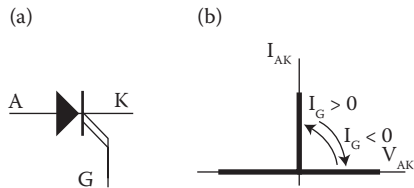


FIGURE 3.3

The GTO's symbol (a) and its ideal characteristic (b).

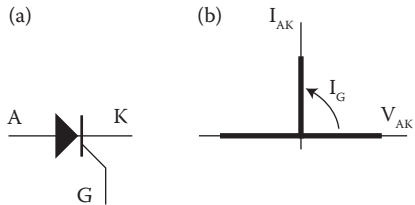


FIGURE 3.2

The thyristor symbol (a) and its ideal characteristic (b).

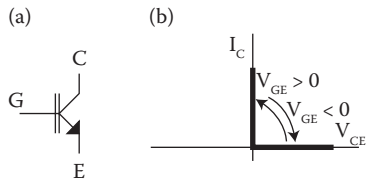


FIGURE 3.6

IGBT's symbol (a) and its ideal characteristic (b).

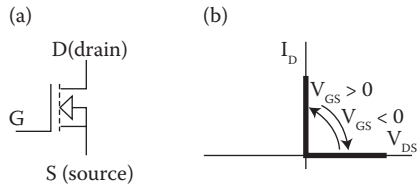


FIGURE 3.5

MOS transistor symbol (a) and its ideal characteristic (b).

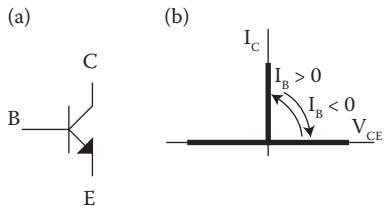


FIGURE 3.4

The BJT symbol (a) and its ideal characteristic (b).

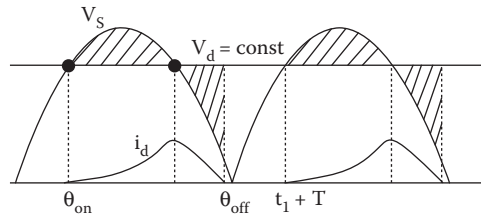


FIGURE 3.9
Single-phase rectifier—the waveforms.

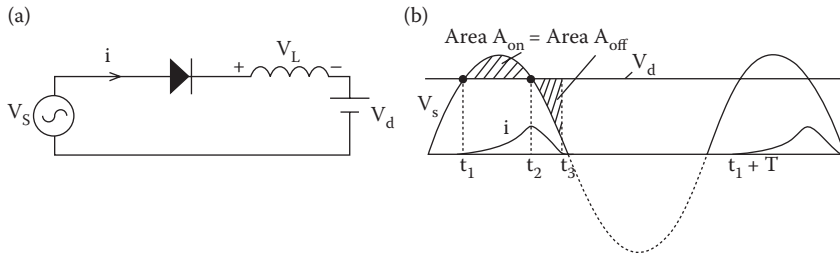


FIGURE 3.8

(a) Basic rectifier equivalent circuit and (b) the voltage and current waveforms.

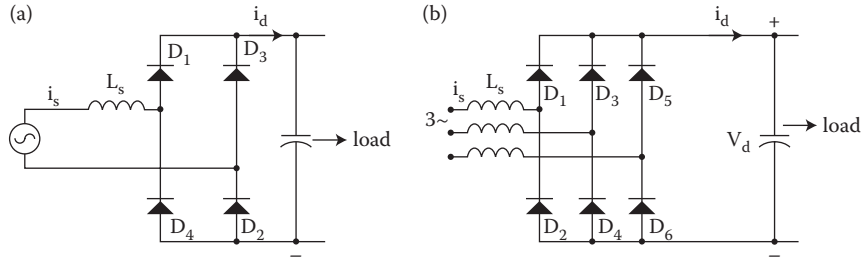


FIGURE 3.7

Diode rectifier with output filter capacitor: (a) single phase; (b) three phase.

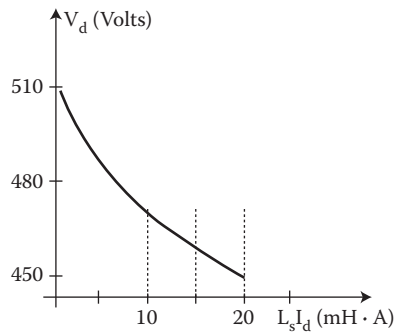


FIGURE 3.10
 V_d versus $L_s I_d$.

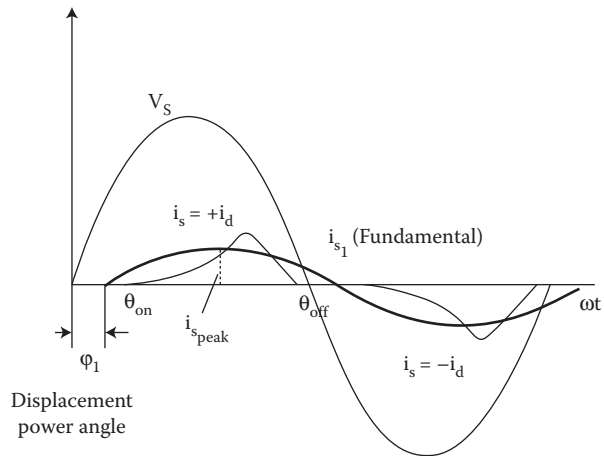


FIGURE 3.11
Source current shape.

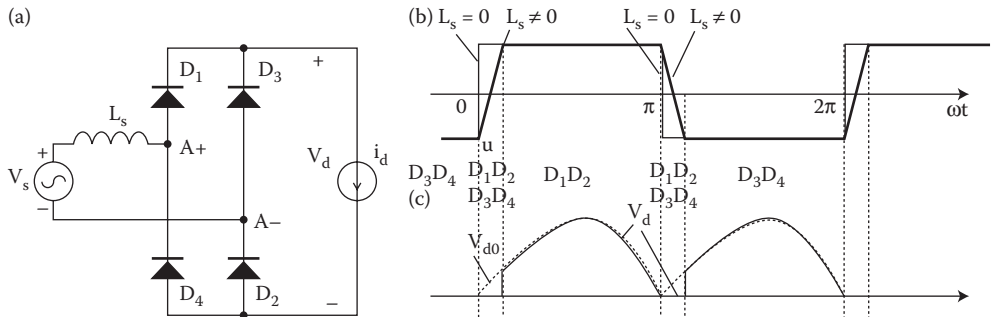


FIGURE 3.12

Current commutation in single-phase rectifier with $I_d = \text{ct}$: (a) equivalent circuit; (b) source current; (c) rectified voltage.

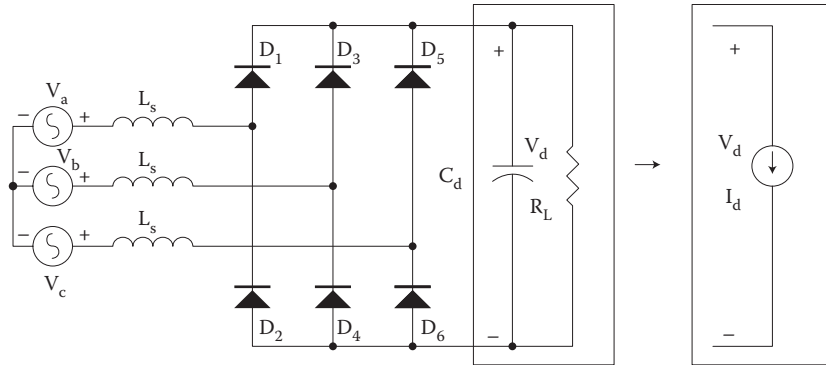


FIGURE 3.13
Three-phase diode rectifier.

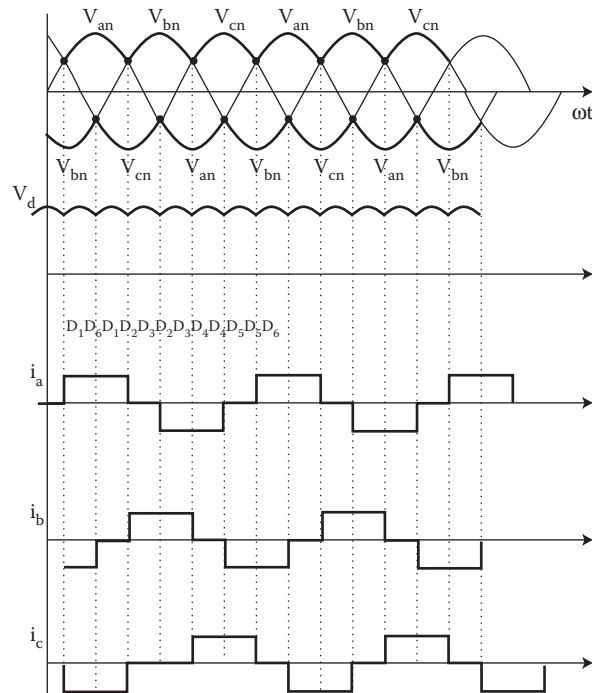


FIGURE 3.14
Three-phase ideal waveforms for $L_s = 0$.

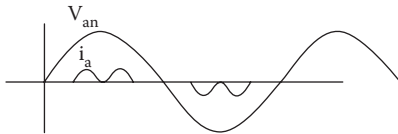


FIGURE 3.16

Three-phase rectifier with finite L_s and infinite C_d ($V_d = ct$)—the source current and voltage.

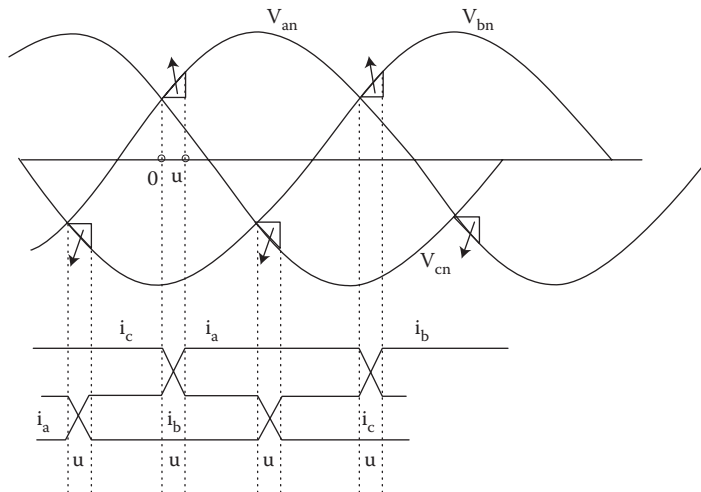


FIGURE 3.15

Three-phase current commutation with $L_s \neq 0$.

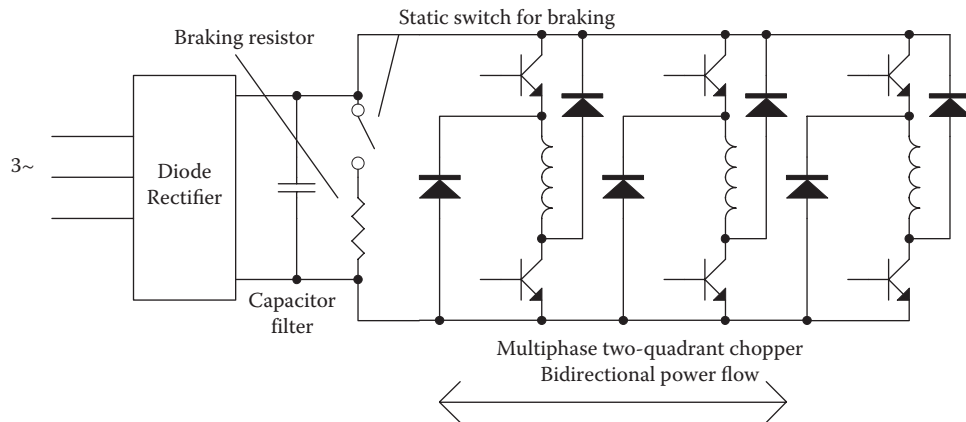


FIGURE 3.17
Multiphase d.c.–d.c. converters for switched reluctance motors.

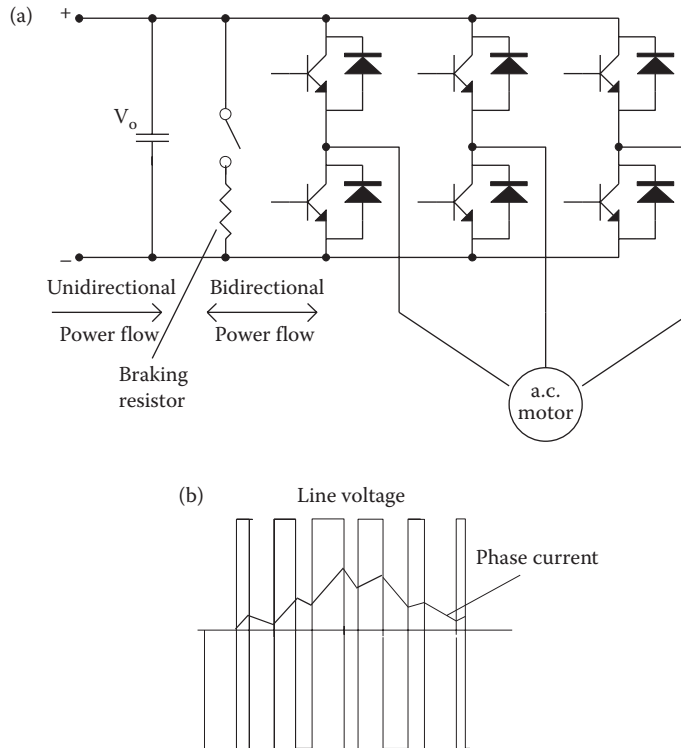


FIGURE 3.18

Voltage-source PWM inverter: (a) basic configuration; (b) output waveforms.

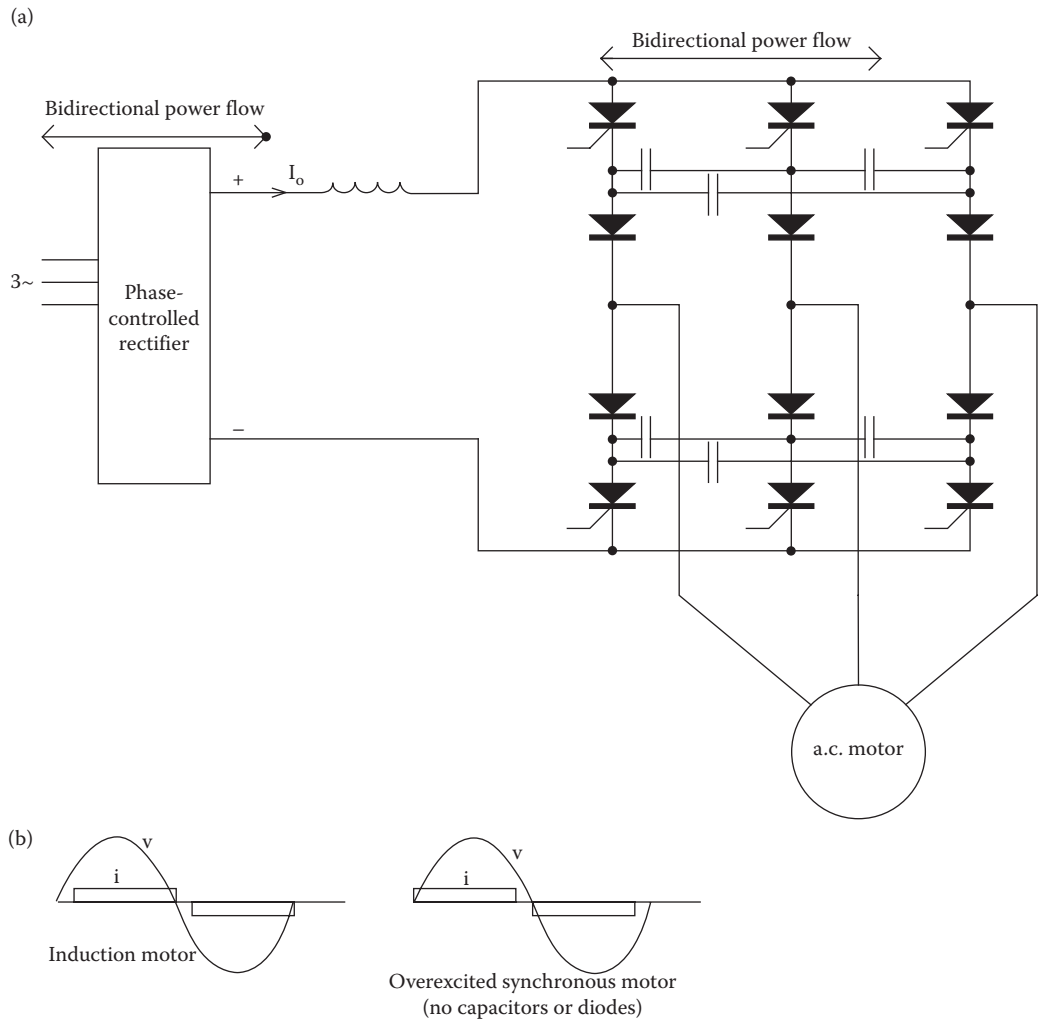


FIGURE 3.19

Current-source inverter (a) basic configuration; (b) ideal output waveforms (i—current, v—voltage).

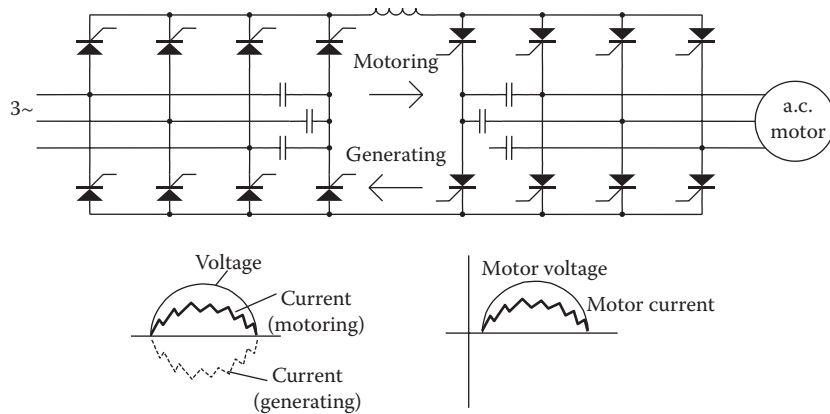


FIGURE 3.21

The a.c.–d.c.–a.c. converter with bidirectional power flow and unity input power factor.

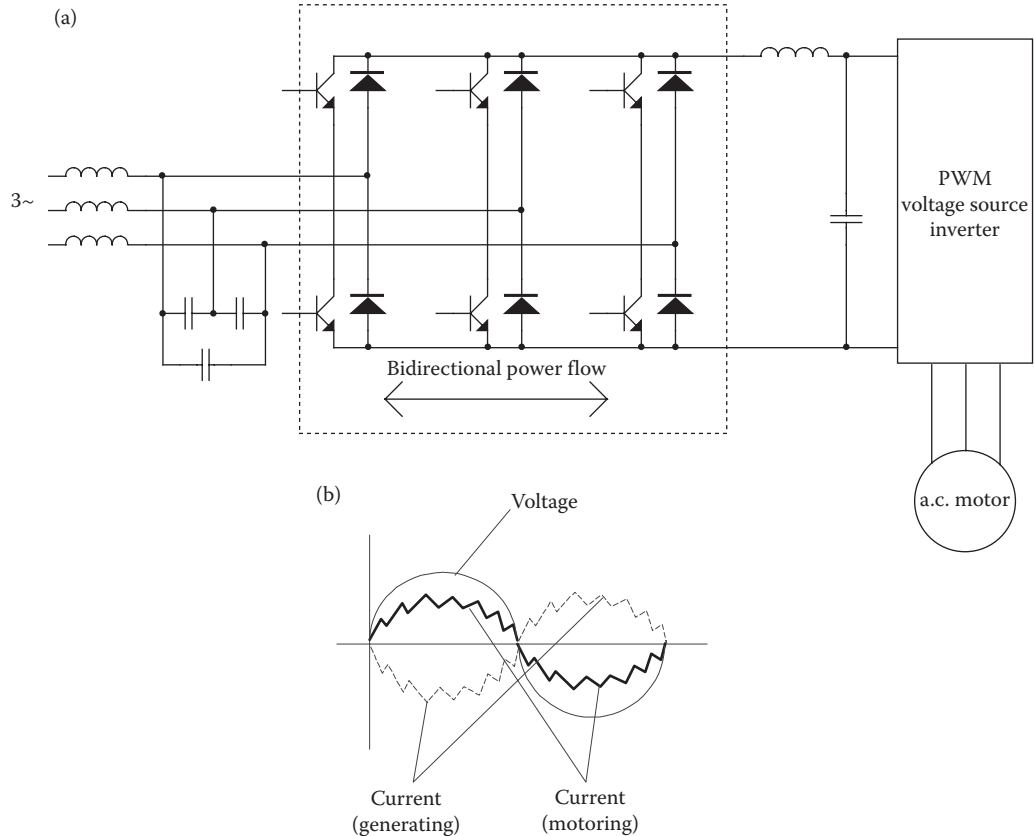


FIGURE 3.20

Bidirectional power flow (dual) a.c.-d.c. converter with unity power factor (a) and sinusoidal inputs (b).

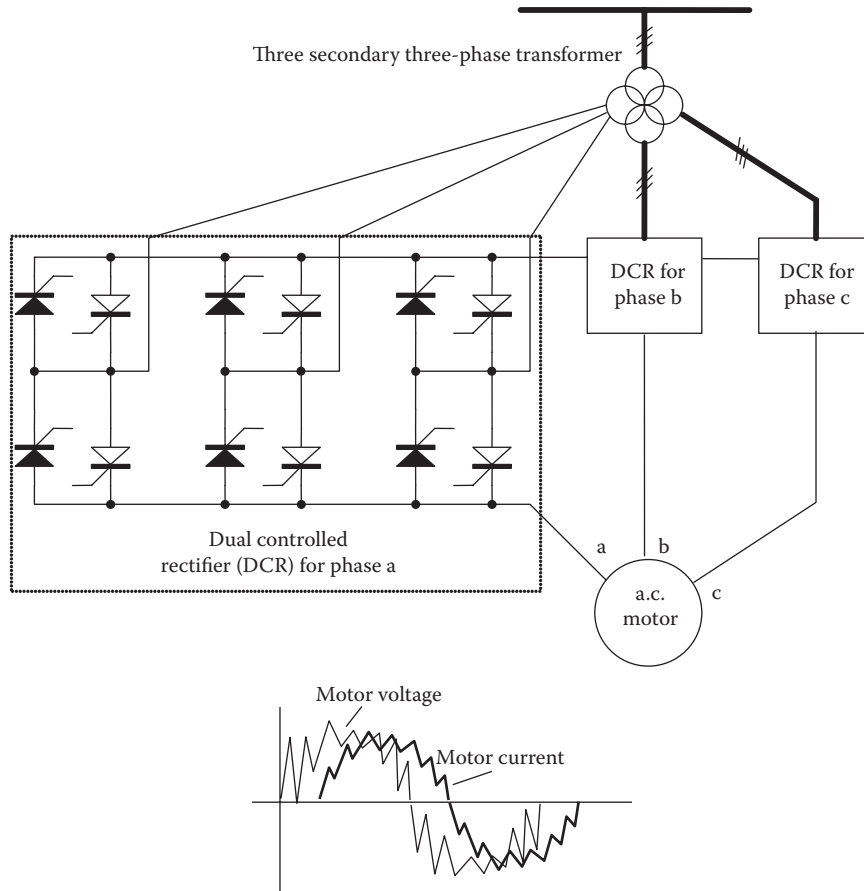


FIGURE 3.22

Six-pulse cycloconverter for a.c. motor drives.

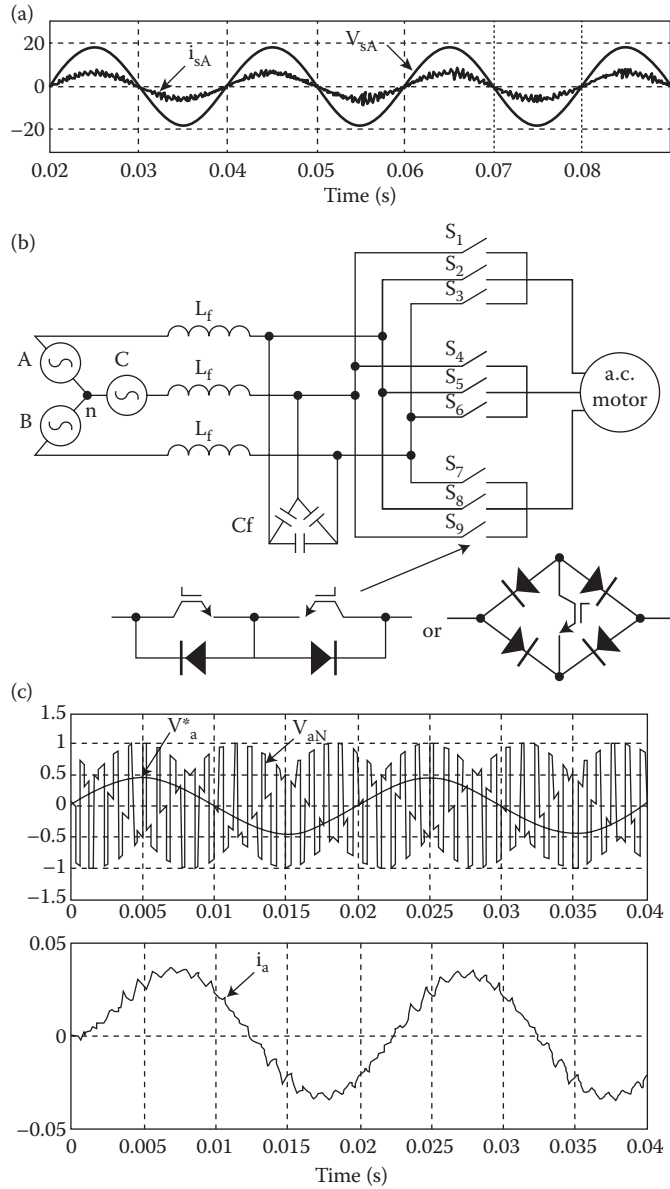


FIGURE 3.23

(a) Input waveforms; (b) three phase to three-phase matrix converter; (c) output waveforms.

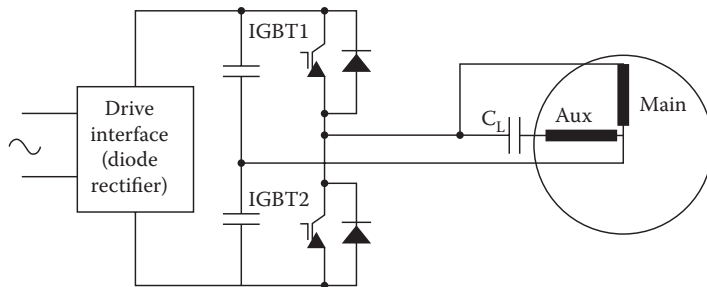


FIGURE 3.25

A B2 inverter supplying a single-phase load.

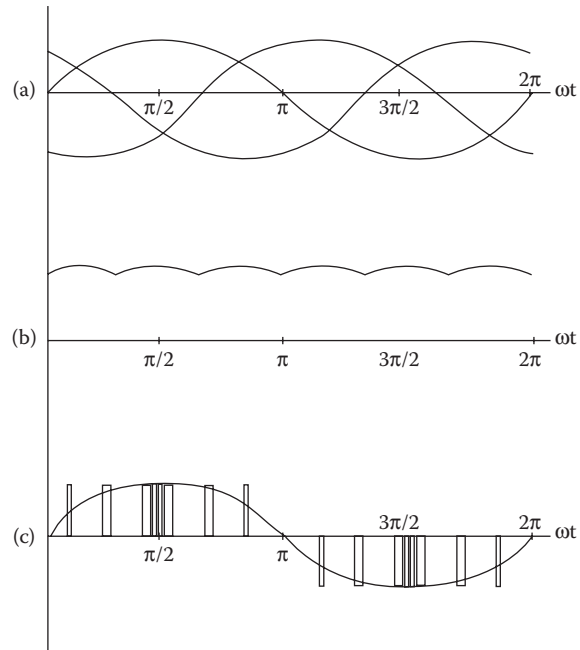


FIGURE 3.24

Matrix converter waveforms: (a) input line voltage; (b) fictitious diode rectifier bridge like d.c. voltage link; (c) output line voltage (v_{ab}).

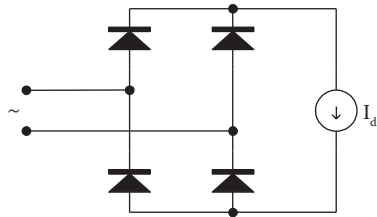


FIGURE 3.26

Ideal single-phase diode rectifier with zero source inductance ($L_s = 0$) and constant d.c. current I_d .