

Three-Phase, Full-Bridge Rectifier

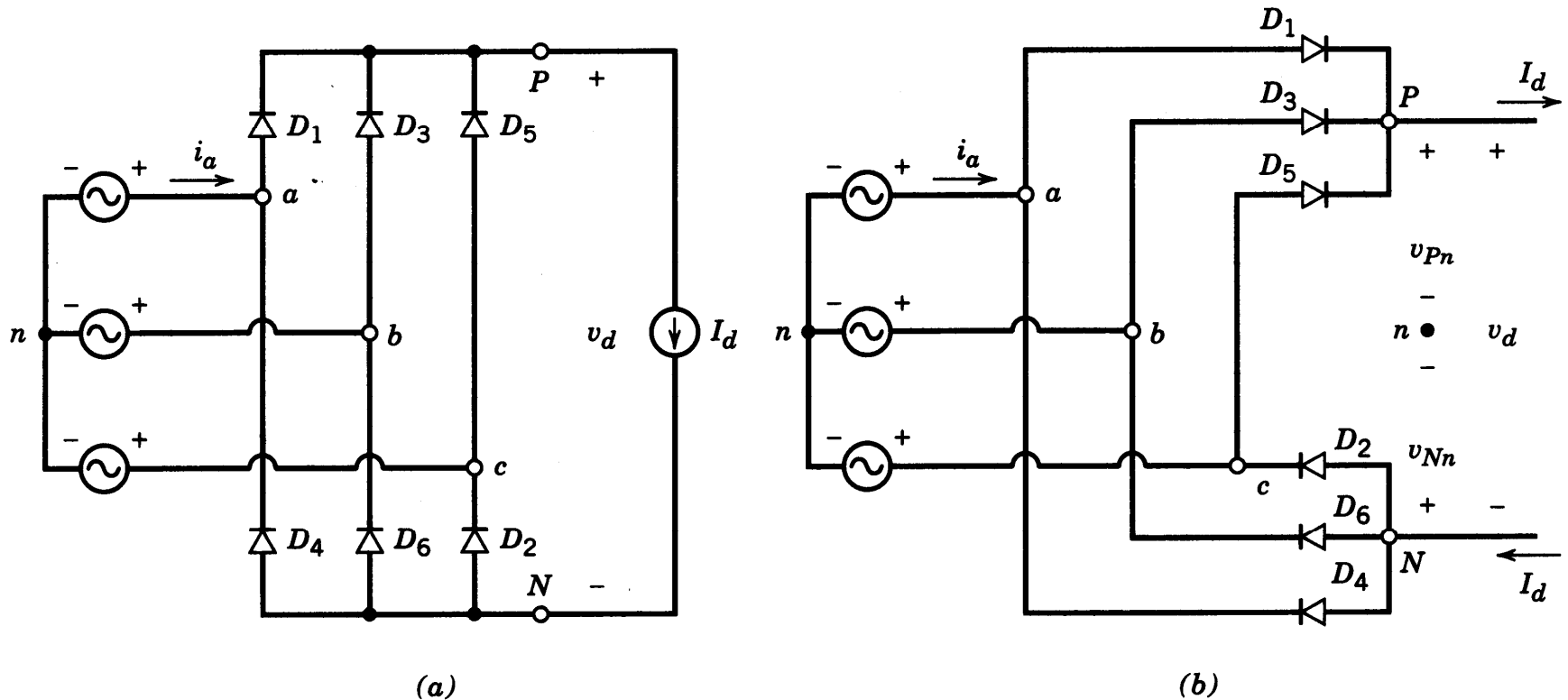


Figure 5-31 Three-phase rectifier with a constant dc current.

- Two groups with three diodes each

Three-Phase, Full-Bridge Rectifier Waveforms

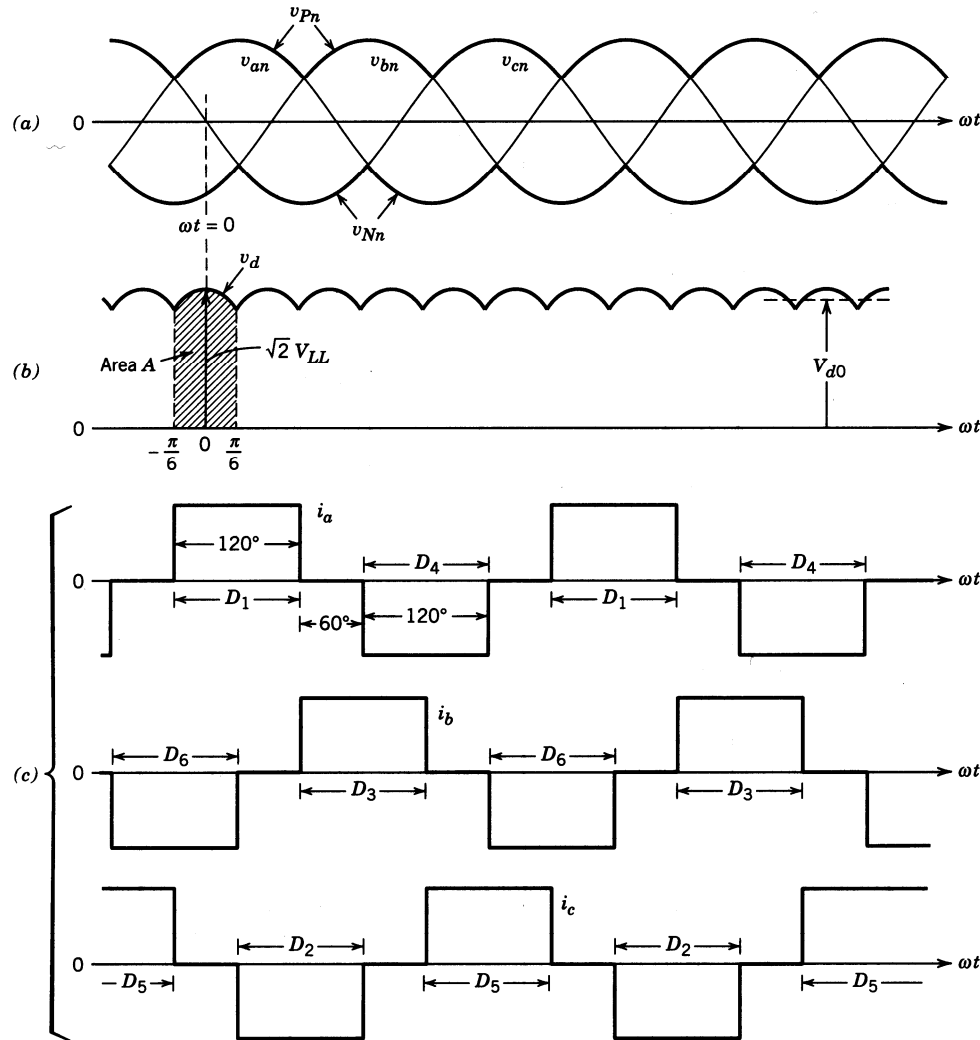


Figure 5-32 Waveforms in the circuit of Fig. 5-31.

- Output current is assumed to be dc

Three-Phase, Full-Bridge Rectifier: Input Line-Current

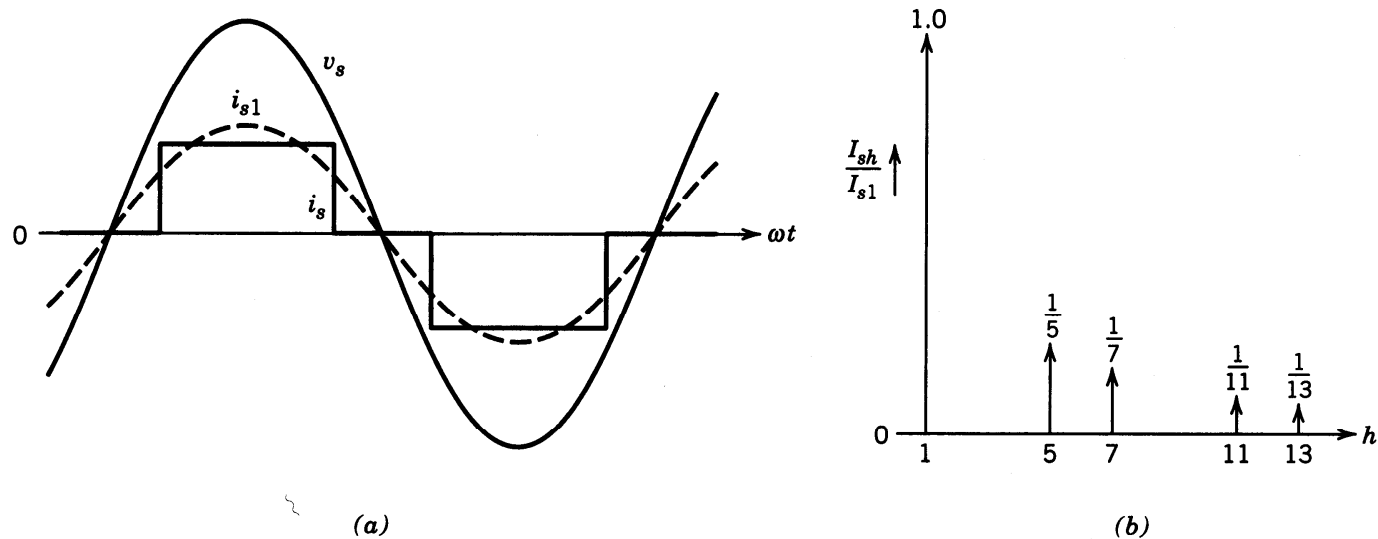


Figure 5-33 Line current in a three-phase rectifier in the idealized case with $L_s = 0$ and a constant dc current.

- Assuming output current to be purely dc and zero ac-side inductance

Three-Phase, Full-Bridge Rectifier

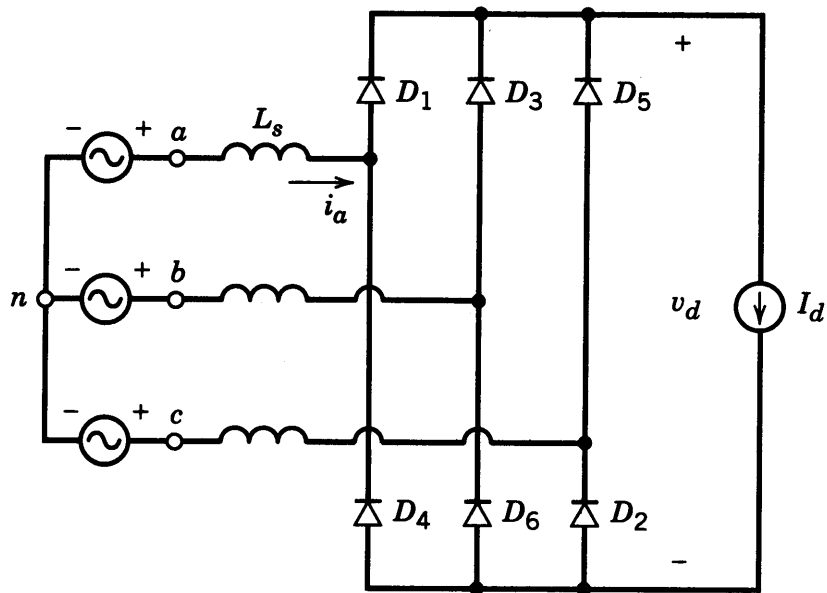
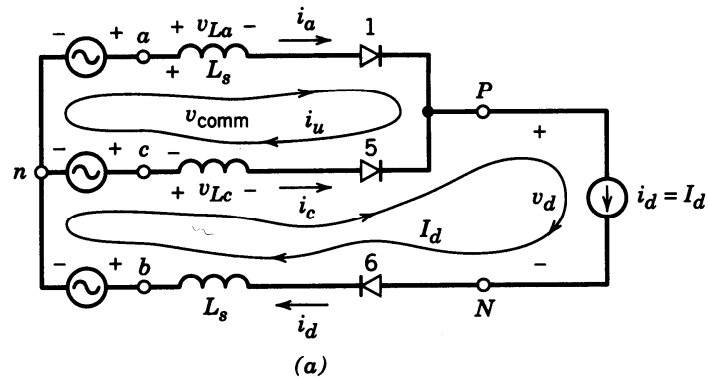


Figure 5-34 Three-phase rectifier with a finite L_s and a constant dc current.

- Including the ac-side inductance

3-Phase Rectifier: Current Commutation



- output current is assumed to be purely dc

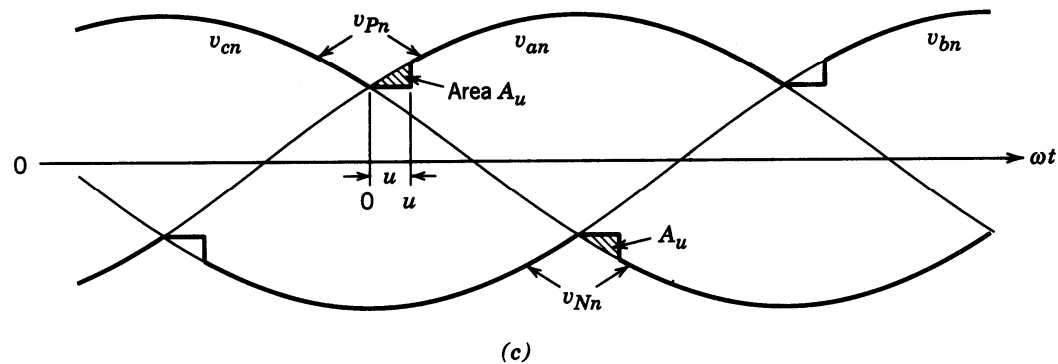
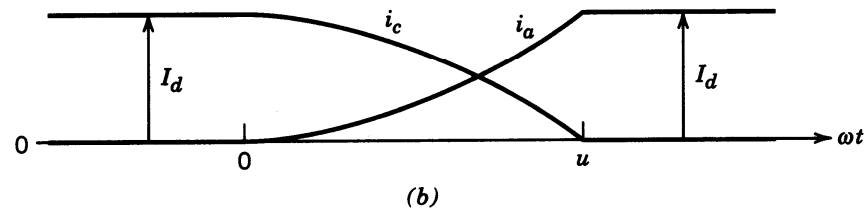


Figure 5-35 Current commutation process.

Thyristor Converters

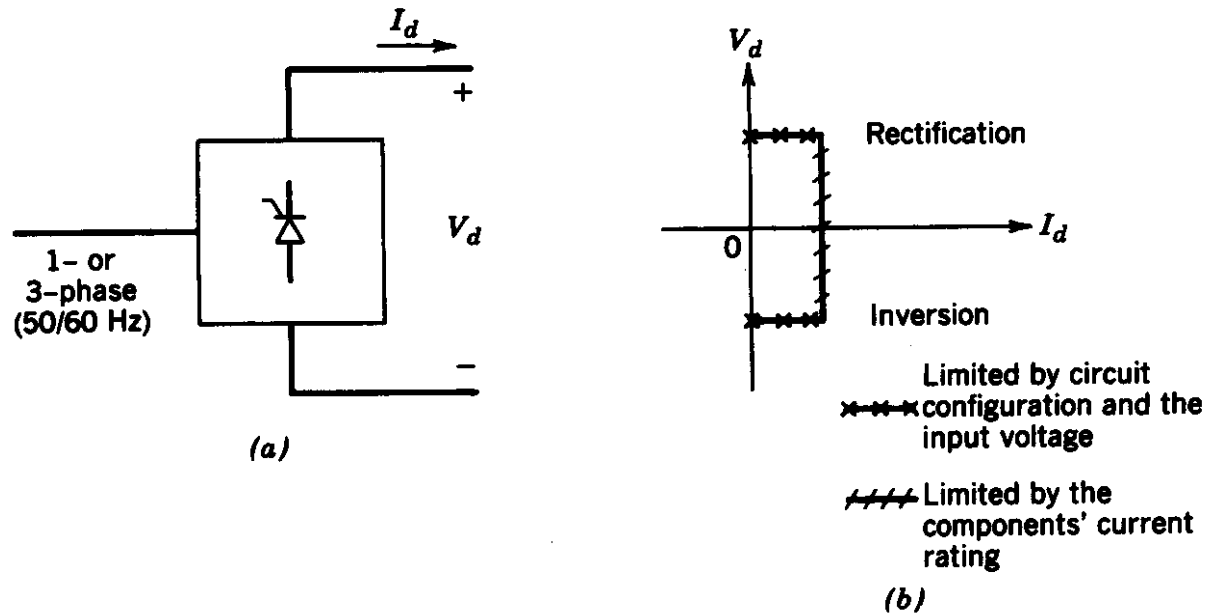


Figure 6-1 Line-frequency controlled converter.

- Two-quadrant conversion

Thyristors

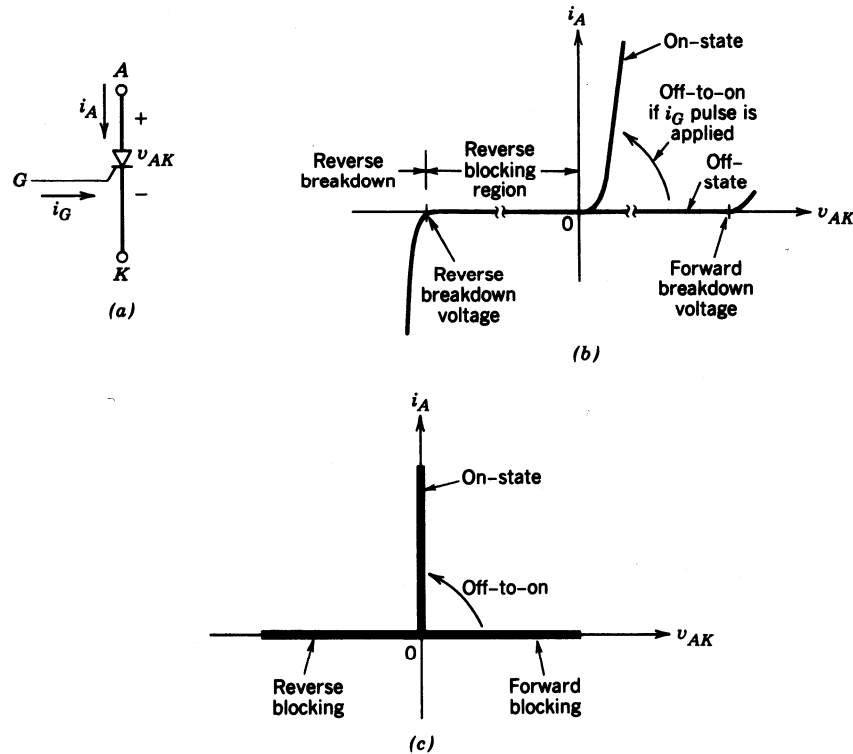


Figure 2-3 Thyristor: (a) symbol, (b) $i-v$ characteristics, (c) idealized characteristics.

- Semi-controlled device
- Latches ON by a gate-current pulse if forward biased
- Turns-off if current tries to reverse

Primitive circuits with thyristors

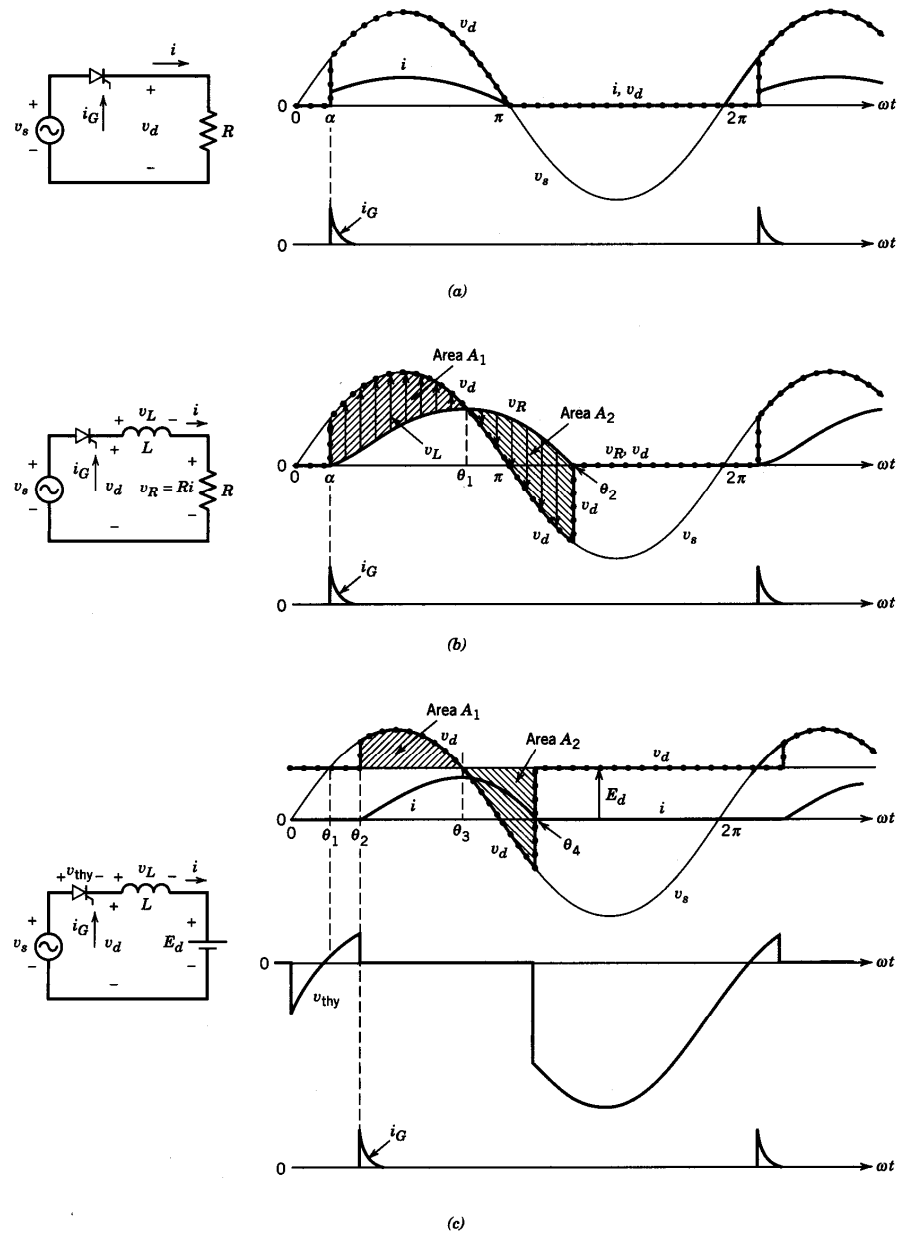


Figure 6-2 Basic thyristor converters.

Single-Phase Thyristor Converters

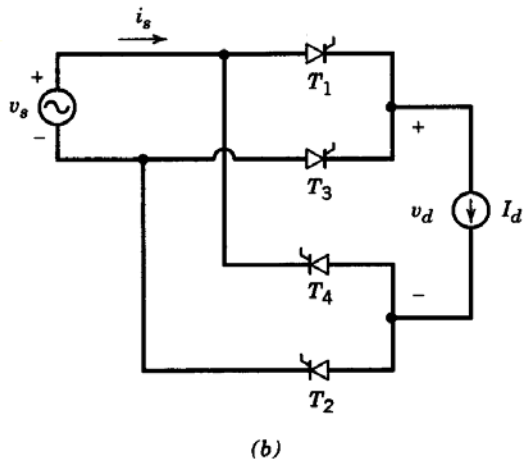


Figure 6-5 Single-phase thyristor converter

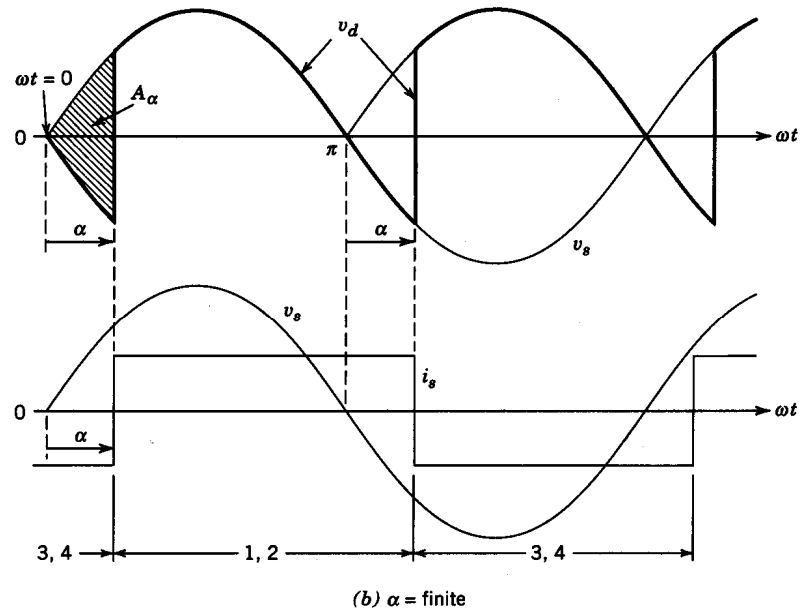
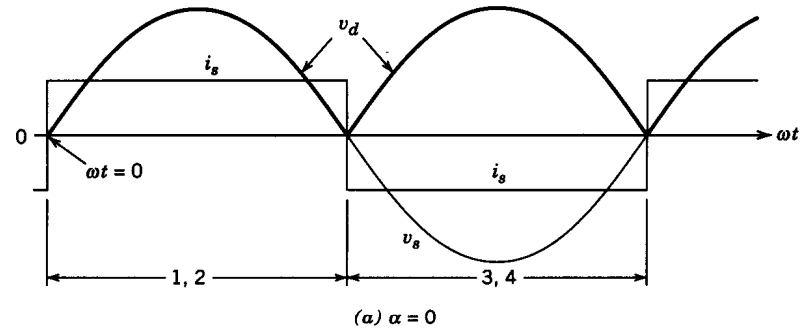


Figure 6-6 Waveforms in the converter of Fig. 6-5.

Input Line-Current Waveforms

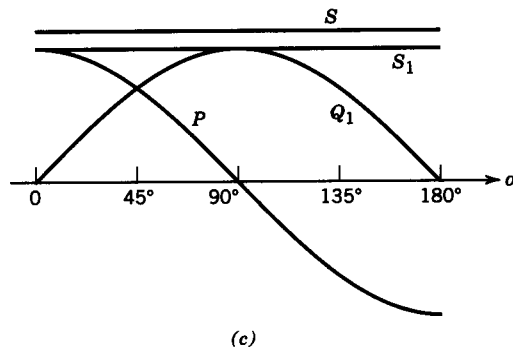
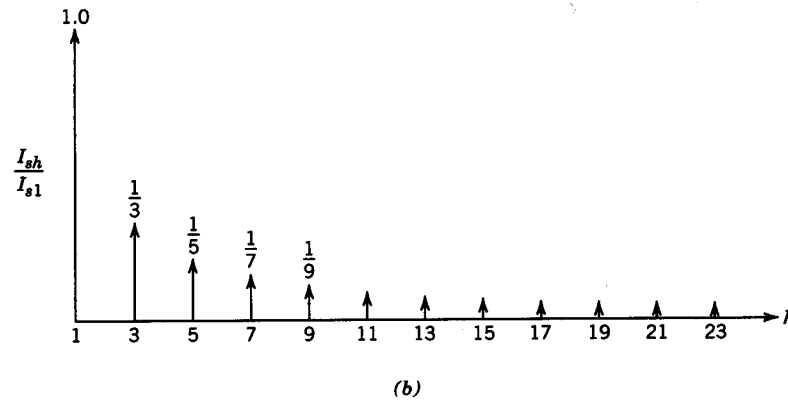
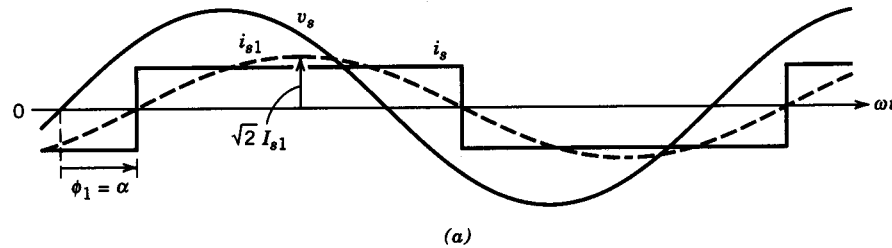


Figure 6-8 The ac-side quantities in the converter of Fig. 6-5.

- Harmonics, power and reactive power

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