Three-Phase, Full-Bridge Rectifier

- Two groups with three diodes each

**Figure 5-31** Three-phase rectifier with a constant dc current.
Three-Phase, Full-Bridge Rectifier Waveforms

- Output current is assumed to be dc

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

Copyright © 2003 by John Wiley & Sons, Inc.
Three-Phase, Full-Bridge Rectifier

- Including the ac-side inductance

Figure 5-34 Three-phase rectifier with a finite $L_s$ and a constant dc current.
3-Phase Rectifier: Current Commutation

- output current is assumed to be purely dc

---

**Figure 5-35** Current commutation process.
Thyristor Converters

- Two-quadrant conversion

Figure 6-1 Line-frequency controlled converter.
Thyristors

- 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

- Harmonics, power and reactive power

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