

Figure 19.44 Direct AC synthesis at the secondary winding of the HF transformer. The PWM high-frequency signal is inverted in the low-frequency rhythm and smoothed by means of L and C_2 . C_1 is needed to store the input energy in the rhythm, which equals twice the low frequency

might become difficult and losses inside the load created by the square-wave character of the supply might occur [9]. For these load-types, ideal sinusoidal voltage supply would be best. In reality, a compromise between this ideal voltage that results in high expenses and a lower quality for cheaper investments must be found.

The deviation from the ideal sinusoidal voltage is normally described as total harmonic distortion (THD). THD is usually defined as the ratio of the square root of the sum of the squares of the rms values of the harmonics to the rms value of the fundamental. This ratio is usually converted to percent or decibels (dB). As an example, the third harmonic and their influence on the shape of the fundamental waveform are given in Figure 19.45.

For high-quality power supply, the THD of the output voltage should be less than 5%, which corresponds with the quality of the public grid.

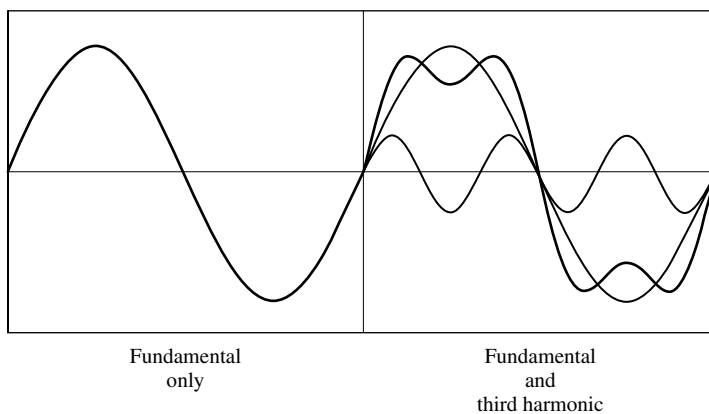


Figure 19.45 Influence of harmonics on the waveform