Method relates to electrical engineering, specifically to power conversion technology, and can be used in voltage-inverter-based resonant converters for various types of industrial equipment, such as ultrasonic cleaning systems and induction heating equipment. In the proposed method for controlling a transistor-based resonant converter based on a voltage inverter with an extended topology, using pulse-density modulation, the number of cycles of the boost interval, which is obtained during the operation of the half-bridge inverter topology, is set to a multiple of the half-cycle of the inverter's output voltage, but not a multiple of the inverter's output voltage period, i.e., such that the number of cycles of the boost interval corresponds to the number $0.5\times(2k+1)$, where k is a natural number including 0; furthermore, when changing the pulse density modulation sequence, this change occurs only after every second modulation period.