converter provides four-quadrant operation of the drive system with the possibility of regenerating the braking energy to the mains. A double-sided modulated AC/DC/AC converter using appropriate control methods ensures the consumption of network currents with waveforms similar to a sine wave.

At the same time, the control system ensures that the inverter can operate at any adjustable value of the *cosφ* power factor. Then the drive system is characterized by the reactive power compensation properties consumed by receivers installed nearby.

The AC/DC/DC conversion processing system proposed in the article with regulated intermediate circuit voltage allows fluent voltage regulation in the 50-550 [V] range. Due to the voltage reduction, the amplitude of the current ripple is reduced, so that the waveform of the sampled average value is milder.

During operation of the system, when the value of the capacitor voltage changes, the current value deviates from the set value, however, this phenomenon may be reduced using the tunable PID (proportional-integral-derivative) algorithm, the regulator used in control systems, taking into account the current voltage value. The controller of this type consists of three parts: proportional, integral and differentiating, whose key goal is to maintain the output value (in our case voltage) at a given level, i.e. set value [19], [20].

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