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ЗМІСТ

voltage on the capacitor is maintained by the constant additional control of the charge from the renewable source.

The conducted research will contribute to the further development of the expansion of the distributed power supply system with the introduction of renewable energy sources.

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POWER CIRCUIT OF AN ACTIVE BOOSTING RECTIFIER WITH MODE POWER FACTOR CORRECTION

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Traction power supply systems are characterized by a number of disadvantages, including: a low power factor, a significant level of emission of higher current harmonics to the power supply network, no possibility of voltage stabilization, as well as a lack of energy recovery from the traction network to the general industrial network [1, 2]. Each of the above factors leads to significant economic costs. Higher current harmonics cause additional losses in the active resistance of the conductors. A low power factor leads to additional costs for reactive power. And the lack of ability to regulate and stabilize the voltage level in the contact network leads to a voltage drop [3, 4].

A rather promising technical solution is the use of active voltage rectifiers with power factor correction. The active voltage rectifier increases the voltage, thereby enabling bidirectional power transmission without changing the polarity of the output voltage, which is a significant advantage for the converter.

The purpose of the research is to increase the energy efficiency of the active rectifier, which implements high quality electrical energy. To achieve the aim, the following objectives were set:

– present the scheme of an active rectifier with a control system;

– determine the parameters of the active rectifier control system.

The most common active voltage rectifier control systems are based on hysteresis modulation. Hysteresis modulation ensures fairly high electromagnetic compatibility with the power supply network and contact network.

In Fig. 1 shows the power circuit of an active rectifier with a hysteresis control system and power factor correction.

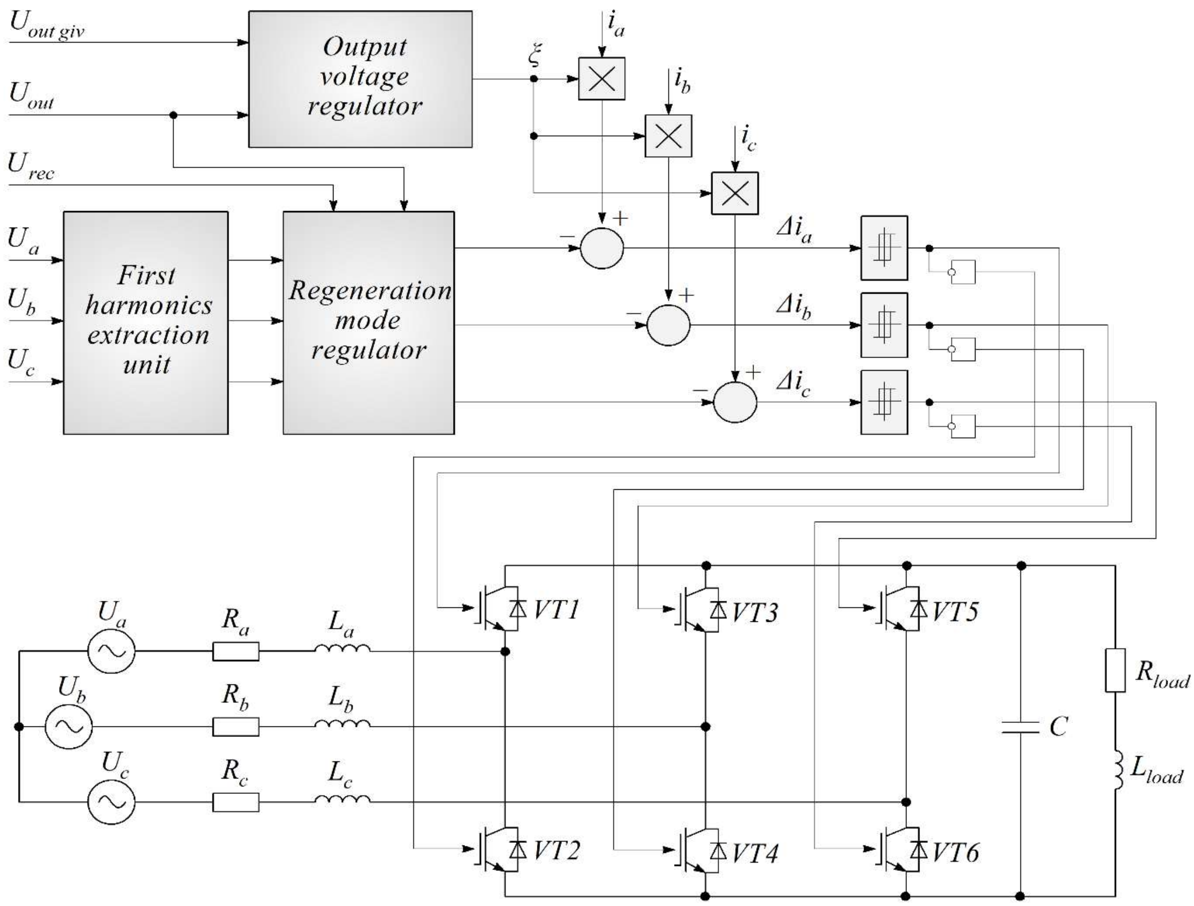

Figure 1 – Power circuit of an active rectifier with a hysteresis control system

The converter includes six fully controlled IGBT switches with parallel diodes, three input chokes, three input resistors, and an output capacitor.

The circuit with the control system allows to adjust the output voltage. The advantage of an active voltage rectifier with a hysteresis control system is the implementation of a high level of electromagnetic compatibility, as well as a high power factor both in the active rectification mode and in the recovery mode.

The conducted research will contribute to determining the stability of the active rectifier as an element of the automatic regulation system.

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