

Circuit for Balancing Harmonic-Polluted Three-Phase Networks

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This paper presents a new circuit capable of balancing harmonics-polluted three-phase power networks supplying single-phase loads. It takes into account the negative and positive sequences exhibited by the fifth and seventh harmonics, respectively. The concept extends the relations of the Steinmetz circuit, which are based exclusively on fundamental frequency considerations. The Steinmetz circuit does not, therefore, guarantee the balancing of the different harmonics in the line currents. Furthermore, it can lead to resonances between the capacitive and inductive elements in the two added balancing branches. A procedure for identifying the topology and the circuit parameters of the proposed connection is given. The results of a detailed case study are presented in order to demonstrate the superiority of the proposed circuit over the conventional Steinmetz connection.



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