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# AN IMPACT OF CHANGES IN THE INDUCTANCE OF DISTRIBUTION NETWORK ON THE MODES AND PARAMETERS OF EQUIPMENT OF THYRISTOR COMPENSATOR OF REACTIVE POWER


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**Abstract**

*An impact of technology changes of inductive resistance of electrical network can be observed on the characteristics and parameters of the bridge thyristor compensator of reactive power established in it to maintain proper values of cosφ. It is determined that with the increase of this resistance, a maximum value of reactive power generated into the network by thyristor compensator of reactive power, also increases, whereas a depth of reactive power control narrows. Thus, when increasing inductive resistance of the network by 25%, the depth of reactive power control, calculated value of which is $x_a$ for the constant parameter, will be reduced almost by half. To improve the quality of input current of thyristor compensator of*

*reactive power (aka line current), i.e. to reduce its harmonic distortion to the values lower than 5%, it is proposed to decrease the reactor inductance, which is connected between capacitor bank and thyristor bridge, during the process of on-load changing. These changes are carried out step-wise by switching the taps of reactors' windings using additional thyristors. Thus, when the depth of reactive power control is 50% and the input LC circuit of thyristor compensator of reactive power is tuned to quadruple frequency (with respect to the mains power frequency), the number of taps that is needed is two. When inductive resistance of the network increases, the frequency of LC circuit setup decreases, which leads to the reduction of taps until their complete absence. When tuning the input circuit of thyristor compensator of reactive power to quadruple frequency, it is possible to connect inductive-thyristor part of the controller directly to the capacitor banks installed in the network without any interference into their equipment. This results in a smooth control of reactive power in the network of capacitor unit with a fixed power.*
References 13, figures 2, tables 3.

***Key words***: inductive resistance, thyristor compensator of reactive power, quality of input current, harmonic distortion, depth of reactive power control.

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