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MODELING OF THE ELEMENTS AND DEVICES OF ENERGY CONTROL SYSTEMS

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Целью исследования является разработка теорий моделирования и проектирования элементов преобразований одно-и многофазного первичного тока для многофункционального управления источниками энергии и создания их базы энерго-и ресурсосбережения. В статье приведены результаты анализа и исследования принципов моделирования магнитных трансформирующих цепей как элементов преобразования тока в напряжение.

***Ключевые слова*:** *элементы преобразований, многофазный первичный ток, многофункциональное управление источником питания, компонент реактивного тока.*

The Purpose of research are developing of theories of modeling and designing the transformations elements one and multiphase's primary current for multifunction control of power source and creation of their base of energy and recourse saving. In the article given results of analyze and explore principles of modeling of magnetic transforming circuits as transformations elements of current to voltage.

Keywords: *transformations elements, multiphase's primary current, multifunction control of power source, reactive current component.*

The input value of transformations elements of the current and voltages serves: primary alternating current of electric nets $I_{e\,in}$ value from *1* before *1000* A and primary voltage $U_{e\,in}$ value from *0,4 - 35 sq*, but output signal $U_{e\,out}$ - a secondary output electric voltage from secondary measuring windings, which in principal depends on uniformities of the sharing the magnetic flow F along way of the magnetic system of the transformation i.e. on length magnetic core, corner of the crossing the magnetic flow area of secondary measuring windings. The Portioned magnetic system of the electromagnetic transducers of the current to voltage with flat measuring windings is presented in the manner of graph of the models.

The dynamic graphs model of the transformation of the primary current in voltage of the electric network of power system on base of transformations elements of the current to voltage is presented in fig.1. At transformation of the primary current on base of the calculation of the values of the portioned magnetic system at the input, according to designed graphic models area transformations, is determined expressions for calculation of the voltage $U_{e\,out}$ on output of flat measurer

windings with provision for distribution m.m.p. *F*, in nodes and magnetic flow on longitude - *F*, transverse - *F0* and vertical - *F1* - an area. Distribution magnetic parameter *R, R0, -R1*, magnetic values - m.m.p. *F* and magnetic flow *F* in area of the magnetic system of the transformation of the electromagnetic transducers of the current to voltage are defined on base of the node equations. The results of modeling and research parameters, input and output values of the electromagnetic transducers of the current to voltage in combined auto control system of sources of reactive power on base of the complex of the programs MATLAB is presented in fig. 2.

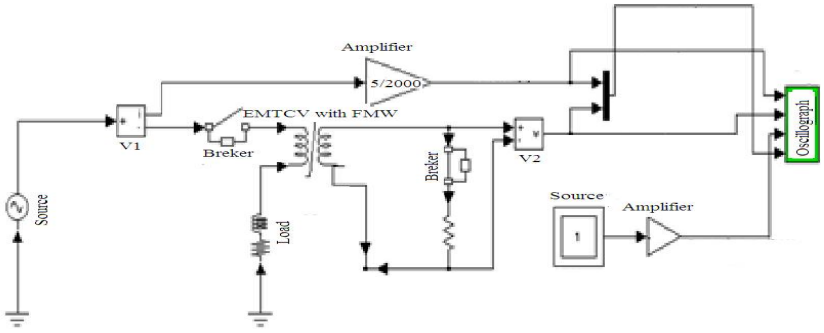

Fig. 1. The Model for research of transformations elements *in complex program MATLAB*

a) *b)* *c)*

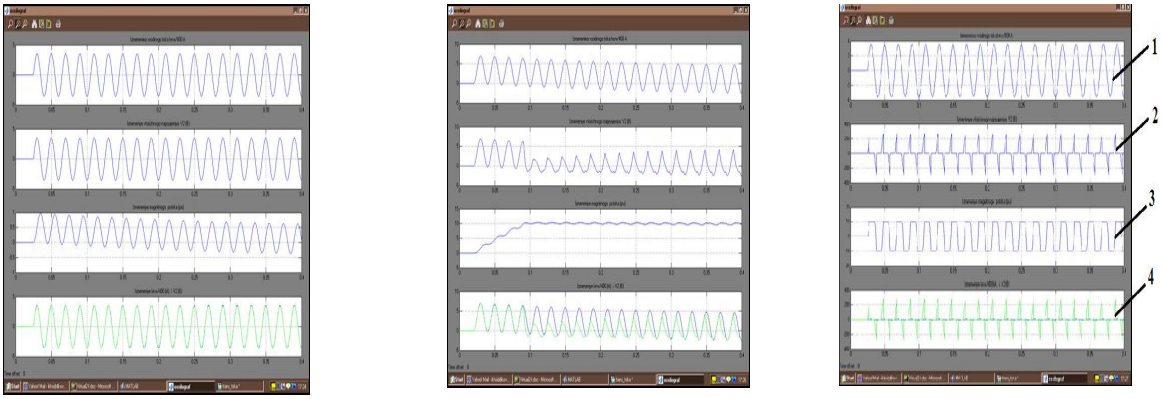

Fig. 2. Graphics of input (1 - a primary current - Ie in), intermediate (2 - m.m.p. F1 and 3- magnetic flow - F2) and output (4 - a secondary voltage Ue out) of the values of the electromagnetic transducers of the current to voltage under: normal (a), asymmetrical (b) mode and in mode of the short circuit (c) in electric networks of power system

As can be seen from the results of modeling and research based on the complex programs MATLAB, connecting processes i.e. change the output voltage of the electromagnetic transducers of the current to voltage are fixed through *0,044* s. after enabling the electric load in current wire of the electric network of energy system.

High-quality and reliable supply of electricity was designed based on power control algorithm of telecommunication equipment and devices for continuous. The most important parameter of algorithm and the possibility of control device that controls the information directly to the power supply, where the power source and the electric current control parameters for users and the

size of equipment for the production of electrical energy based on such information and control processes increase.

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THE PRINCIPLE OF DESING OF ELECTROMAGNETIC TRANSDUSERS OF ONE, THREE AND MULTI-PHASES CURRENT OF ELECTRICAL NETS TO SECONDARY VOLTAGE

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Цель данной работы разработка ЭМС с повышенной надежностью и улучшенными эксплуатационными возможностями. Решена задача о том, что в ЭМКТ к напряжению (ЭМКВТ) магнитная цепь выполняется с одним, тремя и многофазными углублениями, расположенными вдоль оси, которая двумя внешними пересечениями в одном направлении оси, а средой - по другую сторону оси-ИС.

Ключевые слова: *многофазные проводники, электрическая сеть, энергосистемы, участки магнитного сопротивления*

The objective of this work is developed with enhanced reliability and improved operational capabilities of EMCT. The problem is solved that in EMCT to voltage (EMCVT) the magnetic circuit is performed with one, three and multi - phases recesses located along the axis, which two outer recesses in one direction of the axis, and the medium - on the other side of axis.

Keywords: *multi - phase conductors, electric network, power systems, magnetic resistance portions*

The monitoring and control of processes of production, transmission, distribution and consumption of electric energy is very importance's performance means of transformation of current which leads to significant economic losses. Developing an integrated approach, providing high accuracy and efficiency of the combined control sources of electricity, increase operational capabilities, simplifying the design, reducing weight and size indicators, improving manufacturing techniques, ensuring endless measuring processes, a current conversion through the use of modern transducers are ongoing challenges electricity consumption management. The electromagnetic current transformers (EMCT) at the same time