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ELECTROMAGNETIC SWITCHES OF ELECTRICAL ENERGY PARAMETERS

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ABSTRACT

The physical basis of electromechanical transducers is based on the force interaction of the measured current with auxiliary magnetic fields or ferromagnetic masses. They have a number of advantages, such as the simplicity of their construction, high reliability, absolute autonomy, the implementation of multiple limits, the possibility of measuring direct, variable and impulse currents.

KEYWORDS

Introduction

The physical basis of electromechanical current converters is the current generated by magnetic fields or ferromagnetic masses. Their design ensures high reliability, robustness, reliability, reliability, resistance to overcurrent, DC, conduction and pulse currents. Therefore, at currents from 10 to 5000 A, an electromechanical gearshift mechanism is used in the electric motor.

Combined power supply systems are classic single-phase alternating current electric motors designed to operate on high-voltage power transmission lines.

Vine transfarmators. This type of sensor – to-current transformer has three switching elements: currently, the most commonly used values of the output currents of the classical current changers secondary wrappers are 1 and 5 A.

It is examined according to the rated current (in), rated voltage (un) of Transformers, The degree of anicality that is bound to the consumer's load, and the electrodynamic and thermal stability (K_{din} and K_t). Electrodynamic endurance occurs only if the condition in the tail is met:

$$K_{дин} \geq \frac{i_y}{\sqrt{2} \cdot I_{H1}} \qquad \text{ekи} \quad K_{дин} \cdot \sqrt{2} \cdot I_{H1} \geq i_y,$$

here it will be listed in the catalogs for Kdin - Transformers; The nominal current of the primary voltage of the in - current transformer (measurement transfarmators). The thermal tolerance of current transfarmators is given in catalogs for a duration of one minute:

$$K_t \geq \frac{I_k \cdot \sqrt{t_k}}{I_{H1}} \qquad \text{eku} \quad \left(I_{H1} \cdot K_t\right)^2 \geq {I_k}^2 \cdot t_k ,$$

When a current transformer fulfills a condition in the secondary winding of the charge song its anicity is at the required level:

$$S_{2H} \geq S_x ,$$

in this case, the nominal load of the secondary voltage of the s2n - current transformer is given in the references.

The kuvvat of the SX-tok transformer(measurement transfarmator) secondary chulgham (V. A

$$S_x \approx I_{2H}^2 \cdot \left(r_n + r_c + r_k\right),$$

here, the i_{2N} - current transformer is the nominal current of the secondary coil (I_{2n}=5A), the RN is the active Karsh of the instrument circuits connected to this coil, the resistance of the wires used in measuring the GS– transformer resistance, the resistance of the rk - contacts (rk=0.1 Om), the cross-sectional surface of the wires in the secondary coil is required to be no less than 2.5 mm_2 for

Power supply system current and power management does not satisfy the requirements of modern electronic and microprocessor devices. Because in this case, the electrical power of the load reaches several hundred volts-amperes, which requires the need to connect to the output of additional suitable elements and devices as intermediate transforming Transformers.

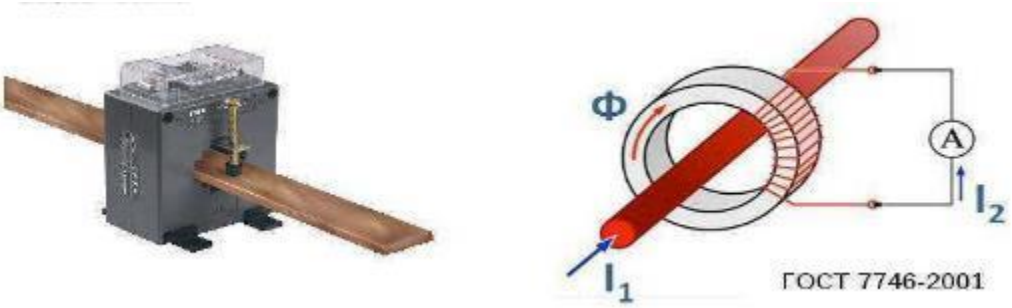
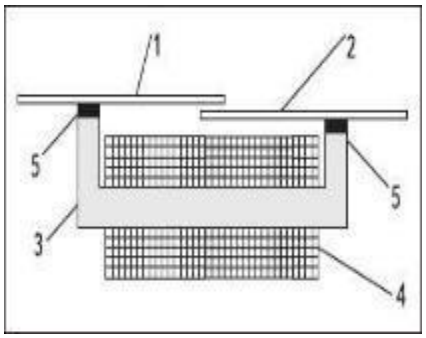


Figure 1. Classic current transformer.1-magnetic core, 2 - secondary core –w2, 3-primary current conductor - primary core-w1.

Four-element sensors of single and three-phase primary currents.

Professor V. The key elements of the one-phase four – element magnetic controllable contact-sensor (gerkon) created by Kovalenkov are shown in Figure 2. 4 - current conductor in a single-phase four-element primary current sensor - 1-excitable contact when current flows through the primary loop



2 – connects to the non - excited contact, when the current flow stops, Contact 1 is disconnected from Contact 2.Figure 2. Professor V. Kovalenkov identified the main elements of the magnetic field:1-fixed contact, 2-fixed contact, 3-magnetic core, 4 - current conductor-primary lead, 5-isolation.

In a four – element sensor in the form of a Gerkon, 5 - isolation is used as an auxiliary-isolating material.

Thus, in the wide range of applications of current changers, the measurement of currents serves the following purposes: three-

phase electrical network electroautomatics and power supply system control the mode of operation of electrical devices; control and accounting for electricity consumption; assessment of the technical characteristics of electrical devices of the power supply system (for example, during tests).

As for the accuracy of the change in current, the requirements of the class of current changers, they are very diverse. Changes error 0.1...It should not exceed 0.5%, for example, when accounting for and controlling electricity consumption, the power supply system in electrical device tests. Power supply systems in the rapid control and protection of electrical devices, it is necessary that the accuracy of Electrical Automation elements and devices is very high.

Three-phase current transducers must have small amplitude and angular errors in the change in the load input signal resistance; be reliable, ensure the stability of the main characteristic of time and external influences, follow fast operation.

Honeywell's modifiers are plug sensors

Table 1 gives the most widely used switches from the famous Honeywell company, the current sensors, which are designed to measure and control constant, variable, pulsed currents and create a feedback system.

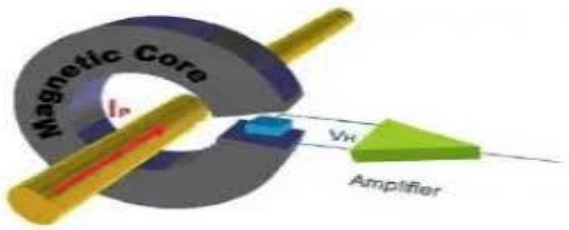


Figure 3. Hall effect I based sensor.

Hall effect-based sensors and electromagnet TTS as seen in Table 1, Honeywell's resistive modifiers-current sensors contain a resistive element and are incorporated into the chain being measured. Hall effect-based modifiers have high accuracy in measuring large currents due to the saturation of the magnetic system, limited accuracy, high cost, requiring additional power supplies.

Table-1 Technical characteristics of Honeywell company current changers

Key indicators	Resistive modifiers	Hall D-burner	Electromagnetic
Precision	0,02–0,5	0,02–0,5	TT
Accuracy at non-standard temperatures	0,12–1	0,2–1	0,2–1
Measurement of large currents, CA	0.1.	Up to 20	0,5–3
Displacement between current and voltage	Do 20 / /	0	Up to 200
Isolasia, Mom	0	1000	0
Connection to the source	Contact	Contact s track	1000
AC / DC metering	AC / DC	AC / DC	Contactless
Price	Low	Tall	AC only
Power consumption, and	75	5	Middle

Honeywell's electromagnetic TTS only allow AC measurement and have a relatively small frequency range. The advantage of electromagnetic TTS is that without power and energy losses, there is no need to use displacement voltage and external power, the cost and power consumption are low.

So, although there are many types of current switches, but in the control and control of the power supply system, it is required to choose the optimal type of switches, consider their advantages and disadvantages, develop new categories of them.

An initial analysis of the structures of electromagnetic current switches and a relative assessment of their cited capabilities showed that KFIEMTO' (electromagnetic current voltage switches with enhanced functionality), which, due to the simplicity, high reliability and economy of the structure and technology of its preparation for controlling reactive power in an electric power system, changes the full current value to a voltage output signal, is

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