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IMPROVE THE FUNCTIONING OF ELECTRICAL NETWORKS, VOLTAGE 6-35 KV BY MONITORING ELECTRICAL PARAMETERS

N. Sorokin, engineer

e-mail: gaalx@ukr.net

Remote monitoring of high-voltage circuit breakers in electric networks of 6-35 kV is one of the main factors increasing the reliability of electricity supply. Lack operative remote control causes the consumers in the case of emergencies, may have significant interruptions in power supply, which time may be 2-3 hours or more. It depends on many factors, such as remote customers, the availability of communication means, etc. [1].

The purpose of research - to develop a system of recognition of emergencies in the distribution networks 6-35 kV.

Materials and methods of research. Existing methods of remote monitoring of high-voltage circuit breakers can be divided into two groups. The first involves the use of special transfer devices and communication channels, the second is not necessary to use them.

Methods of the first group have the following drawbacks, complicating their use in distribution networks 6-35 kV [1]:

- A large number of transmitters with a significant number of controlled switches;

- Decrease in the reliability of information to be transmitted, depending on weather conditions (snow, ice, etc.);

- The need for coding and decoding devices;

- Complication of the operating system of reception and transmission of information by a large distance devices from each other and from the point of collection of information;

- The need for service personnel with a high degree of qualification;

- The high costs of construction and operation of the system of collecting information.

The results of research. To implement the methods of the second group that do not require transmitters, it has developed a system of recognition of emergencies in the distribution networks 6-35 kV, which consists of a sensor, a personal computer, special software.

The sensor system has two blocks (block connecting the sensor (BAP) and the digital data processing unit (BODC)) interconnected by a communication cable [3].

BAP is required to obtain a signal of change in the line current. This can be accomplished using a clamp meter. For example, you can use the model DT3266A. Schematic diagram of the BAP is shown in Fig. 1. Operation of the unit is described in detail in [3].

BAP is made on the basis of current clamp, has a number of advantages [3]:

- No need to break the current circuit when connecting and intervention in the circuit;

- It has greater reliability and security through the use of full decoupling of the measured circuit (connection to the current paths can be seen visually, and not in a closed box);

- The ease and speed of installation;

- It has smaller dimensions and dissipates significantly less power than the currently used versions of the devices;

- More acceptable to connect to complex digital blocks, as is additional protection against accidents and static electricity.

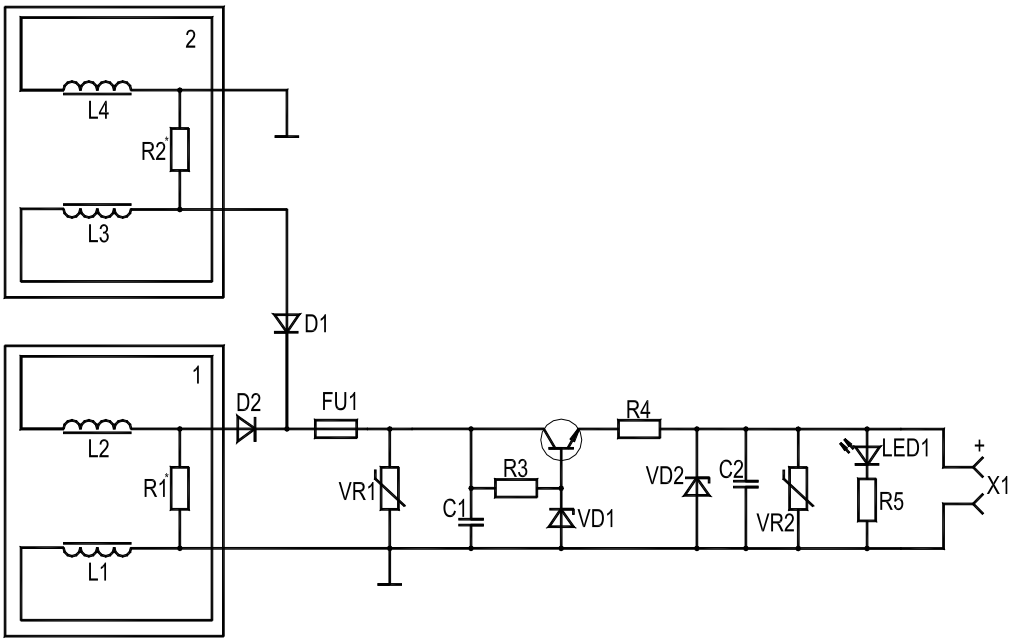

Fig. 1. Schematic diagram of the BAP:

L1 - L4 - coil; R1 *, R2 *, R3, R4, R5 - resistors; C1, C2 - capacitors; VR1, VR2 - varistors; VT1 - transistor; VD1, VD2 - Zener; LED1 - LED; D1, D2 - half-wave rectifier; FU1 - fuse

BODC used to convert the signals of changes in the parameters monitored line in pulses, which are then fed to a personal computer, decrypted, analyzed and transmitted to the PC monitor, with the help of special software. At the same time the duty manager appears information about the emergency occurred.

Schematic diagram of BODC shown in Fig. 2. The operation of the described in detail in [2].

To decrypt and analysis derived from BODC data on a personal computer installed specially designed software.

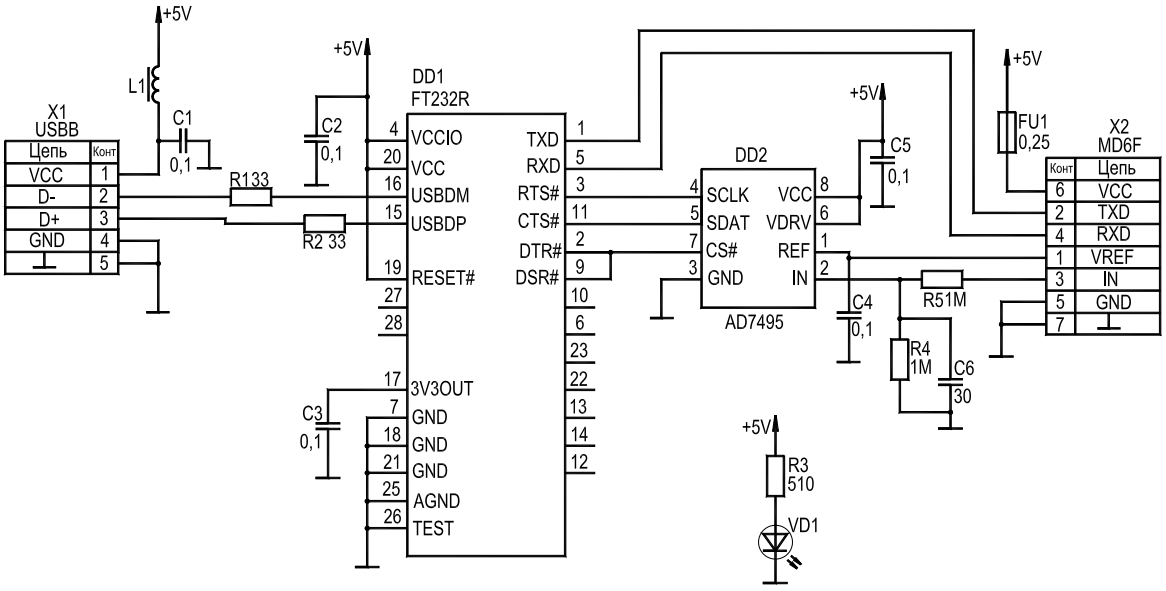

Fig. 2. The electrical circuit diagram BODC:

R1-R5 - resistors; C1 -C6 - capacitors; L1 - the throttle; FU1 - Fuse; VD1 - LED

BODC consists of two chips: the first - AD7495, the second - FT232R. Signal BODC receives input jack MD6F of the BAP. His power is supplied from the connector USB.

Conclusion

This system is simple and inexpensive. It allows you to remotely monitor the work of high-voltage switches that will enable service personnel to take measures on emergency response to the receipt of information from the consumer. This will reduce the time and interruption of power supply to increase the efficiency of electrical networks, voltage 6-35 kV.