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DEVICE OF AUTOMATIC DETERMINATION OF SINGLE-PHASE EARTH FAULT CURRENT IN 6 – 10 KV ELECTRICAL NETWORK

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In this work the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network was developed.

The development of the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network is in selecting and substantiating the elemental base for the technical implementation of its architecture [1-3].

The main requirements imposed on the control units of information processing devices, which include the developed device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network are: low cost, high reliability, high degree of miniaturization, low power consumption, operability under harsh operating conditions, sufficient performance to perform the required functions, versatility. These requirements can be met by the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network based on a microcontroller control system. The functional diagram of the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network is shown in Figure 1 and contains:

- three-phase electrical network with phases A, B and C;
- voltage transformer TV;
- full conductivity of the electrical network Y;
- additional capacitive conductivity b_0 ;
- load switch QF1, switching additional capacitive conductivity;
- load switch QF2, switching power supply of current-using equipment;
- microcontroller MC;
- block of voltage sensors BVS;
- analog-to-digital convert ADC;
- timer;
- non-volatile random access memory device NOVRAM;
- actuator ACT;
- power supply unit PSU;
- control module CM;
- galvanic decoupler unit DCU.

Microcontroller Control System (MCS) is equipped with 10W power supply unit.

The practical significance of the work consists in developing the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network designed to improve the reliability of power supply and safety of operation of current-using equipment in 6-10 kV electric networks.

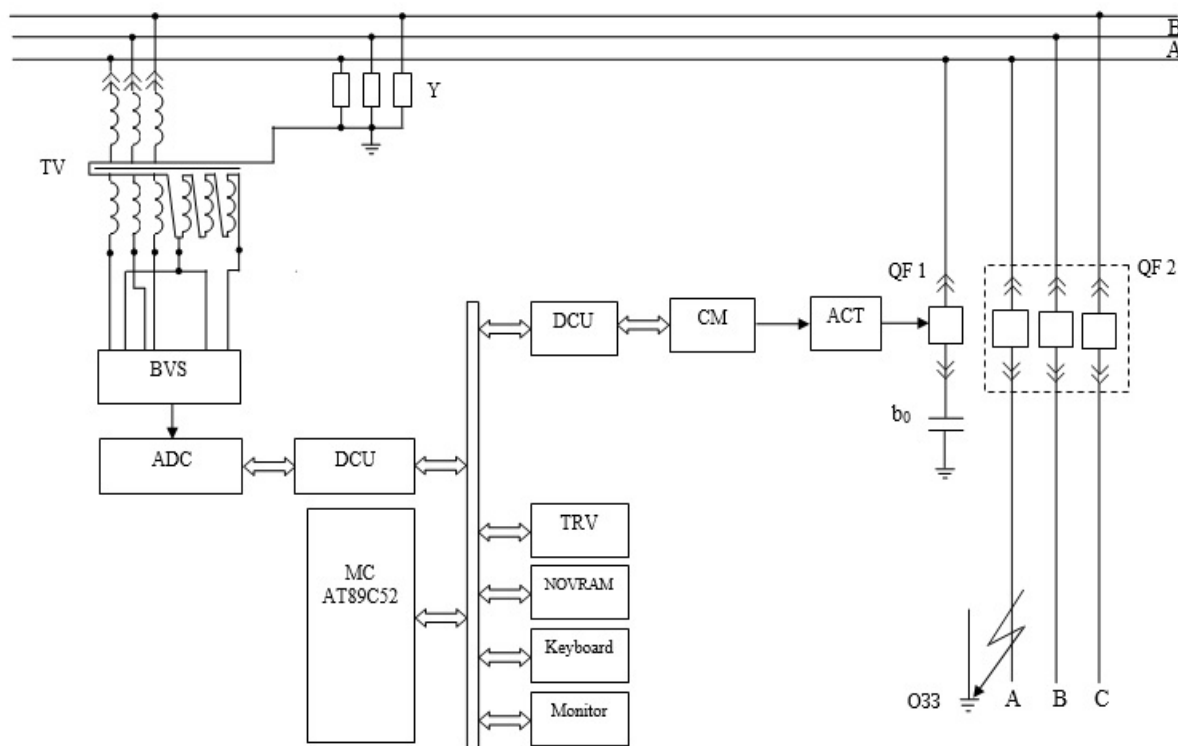


Figure 1 – Functional diagram of the device of automatic determination of single-phase earth fault current in 6 – 10 kV electric network implemented at MCS

When implementing the results of work, the effect will be expressed in reducing unnecessary downtime of technological equipment due to non-selective action of the main types of relay protection and overvoltage in the network with arc alternating earth faults.

References

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