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CELLULOSE INSULATION HUMIDITY MONITORING OF POWER TRANSFORMERS

The parameter monitoring peculiarity is measuring inside of the operating high-voltage equipment. Humidity is one of the important parameters, which determines the resource consumption of cellulose insulation of power transformer windings.

Nowadays humidity of cellulose in the power transformer is estimated by results of oil humidity measurements. This method has low accuracy, it means that the estimation accuracy of a cellulose insulation resource is low. Therefore, increasing the accuracy of measurements is an urgent task for developers of high-voltage equipment monitoring systems. The purpose of the work is to substantiate the measurement of the humidity of cellulose insulation of the windings of the power transformer during its operation. The main tasks of the work are the choice of the method of measurement, the justification of the structure of the humidity monitoring subsystem, the choice of the sensor, the method of transmitting

measurement data and energy for supplying the electrical circuit of the sensor through a medium with high intensity of the electromagnetic field.

It is suggested to use a resistive method for measuring the humidity in combination with measuring the temperature at the insulation boundary and the windings of the transformer. The amount of moisture in the insulation determines the value of the electric current at the sensor output. This current, in turn, specifies the intensity of the light flux transmitted over the fiber through a zone with high intensity of the electromagnetic field inside the transformer to the converter located outside the transformer. For the power supply of the sensor measuring circuit, it is supposed to use a photovoltaic converter, which is also illuminated through an optical fiber with a light flux from an external laser diode.