

ABSTRACT

The master's dissertation contains: pages 86, figures 32, tables 25, literary sources 27.

Urgency of work: The use of monitoring, monitoring and diagnostic systems for rotor equipment in power plants is very relevant in our time. Since most units operate in high load mode, control systems provide stable operation of the equipment during operation. Increasing the accuracy of the output signal of diagnostic systems, avoids emergency shutdowns of the equipment, more accurate measurement results. Obtaining information on the parameters of motion and vibration, their changes during the operation and operation of industrial equipment, devices and all kinds of dynamic objects is a priority task in assessing the quality and reliability of their work. Therefore, the development and creation of high-performance measuring devices in the area of measuring, monitoring and assessing the stability of the operation of dynamic objects, as well as changing their state during operation sets the task of developing more advanced methods and means of control and measuring equipment.

The purpose of the master's thesis is to increase the linearity, increase the accuracy, expand the range, improve the geometric parameters of the sensitive elements of the control system and the diagnostics of the vibration parameters of the rotary equipment.

Research objectives:

1. To consider and analyze problems of control and measurement of vibration.
2. To investigate the influence of the geometry of the sensing element of the sensors of the system on the output characteristic.
3. To develop an automated method for increasing the accuracy of the output characteristics of the eddy current sensor.
4. Develop a startup project for the possible presentation of a product on the market.

Object of research - Measurement of vibration of rotors of power plants.

Subject of research - Non-contact measurement systems of vibration parameters based on eddy current converters.

Scientific novelty of the obtained results:

1. The geometry of the sensitive element of the eddy current converters for the initial characteristic, for the choice of optimal parameters in the development of control systems and diagnostics of vibration parameters are carried out.

2. The hardware and software methods of improving the linearity of the characteristics of the measuring channel of the system are proposed.

3. The diagrams and the choice of the main elements of the system are presented to improve the accuracy and expansion of the measuring range.

Practical meaning:

A number of recommendations were developed to increase the linearity of the output characteristics of the eddy current sensors, which in turn provides greater accuracy of the displays of the control and diagnostics system of the vibration parameters.