

Annotation

In the diploma work in accordance with the task provides for the modernization of the electric drive of the pumping unit of the dairy farm water supply system. The analysis of operating modes is carried out and the purpose, types, arrangement of pumps are described, the requirements for their electric drives and control systems are determined.

The system "frequency converter - asynchronous motor" is selected as an effective electric drive system. Natural mechanical and electromechanical characteristics are built. In accordance with the law of frequency regulation adopted, artificial mechanical and electromechanical characteristics of the engine for various frequencies are built.

In this thesis, the draft power circuit of an automated pump electric drive was considered and a frequency converter was selected. A structural diagram of the pumping unit is drawn up. Mathematical models of an induction motor and a frequency converter are considered, their parameters are calculated. In the software package MATLAB 6.5 of the electric drive, a virtual model is developed and dynamic characteristics are studied.

The section "Life Safety" provides an analysis of working conditions and compliance with safety regulations during operation of the electric drive. Calculation of fire safety and water purification devices.

In the section "Calculation of technical and economic indicators" the calculation of capital investments and annual operating costs is made and the economic efficiency of the proposed electric drive is determined.