

Abstract

In accordance with the task, the diploma project provides for the modernization of the electric drive of the belt conveyor for the transportation of bulk cargo.

The project provides the purpose, device, operating modes of the belt conveyor, formulated requirements for their electric drives and control systems.

The frequency Converter-asynchronous motor system was chosen as the most efficient electric drive system for the belt conveyor.

In accordance with the load calculations of the conveyor belt and the induction motor type 4A160M8U3 was selected in accordance with the rated power and speed. The parameters of the engine replacement circuit are determined and its natural mechanical and electromechanical characteristics are constructed.

In the thesis, a power circuit of an automated electric drive was developed, a frequency converter was selected and the parameters of its elements were determined. A block diagram of the conveyor block is developed, dynamic models of induction motors and frequency converters are considered, and their parameters are determined. Matlab developed a virtual model of the electric drive and studied the dynamics of changes in speed and torque during the transition.

In the section "Fundamentals of life safety" an ergonomic analysis of the workplace was considered, as well as dangerous and harmful production factors, and an aspiration system was calculated.

The options for choosing an electric drive system for a conveyor belt were compared from a technical and economic point of view, capital costs and operating costs were calculated, and the economic efficiency of the proposed electric drive was determined.