

Abstract

In the diploma work on the task performed work on the modernization of the electric drive of the bridge crane with a load capacity of 15 tons.

This paper provides General information about cranes and electric drives of the crane. Requirements for their electric drives and control systems were noted. The "frequency Converter-asynchronous motor" system was chosen as an effective electric drive system for cranes.

Calculation of the crane loads, an asynchronous motor with a power of 30 kW was selected for the lifting mechanism, indicating the engine replacement scheme, natural and artificial characteristics were established.

In the thesis, power circuits of an automated electric drive were developed, converters were selected, and static characteristics of the electric drive were calculated.

A mathematical model of the electric motor is given, the parameters of the control object are calculated, and a block diagram of the electric drive of the bridge crane is presented. Also, a simulation model of the electric motor was built, and the dynamics of transients was shown.

The thesis presented information about ways to ensure the safety of life in the machine shop, as well as calculations on air pollution in the workplace for the selected installation. The economic efficiency of the proposed electric drive is determined.