

Abstract

Testing the Position Accuracy and repeatability of an industrial robots

The subject of this dissertation is the issue of determining the accuracy and repeatability of industrial robots positioning. The dissertation presents research that led to the development of new, rapid method of measurement accuracy and repeatability of industrial robots positioning in industrial conditions, taking into account the contained in the standard ISO 9283.

This paper describes the principles and methods of measurement, identified and characterized factors affecting the accuracy and repeatability of industrial robots positioning. Research of accuracy and repeatability of positioning were carried out on the basis of the author's method of measurement for selected industrial robots in two versions: full and limited access to an industrial robot at the workplace.

In the next step, was analyzed the variability of performed positioning repeatability value terms of the number of measuring cycles, which allowed to determine the minimum number of them. Designated Cp and Cpk indices and carried out process capability tests showed that the developed measurement process meets the quality requirements.

To determine the repeatability of positioning industrial robots in changing the workspace used method of forecasting. Using linear regression performed analytical tests for industrial robot Fanuc M16iB, and the results showed negative regression line fit to the actual data.

Tests and studies in industrial conditions confirm that the developed method for the measurement significantly reduces measurement time and performance of procedures of inspection / testing for industrial robots at work stations during the production process. Thus designated the accuracy and repeatability of positioning for a limited number of measurement cycles show no significant difference from the results obtained in accordance with the standard procedure.