Analysis of the Methodology of Introduction Into the Educational Process of Modern Technical Measuring Equipment Used in Production, as Well as Caliper Nutrometry and Measurement Methods

Karimova Madinabonu Dilshodbek qizi
Master's degree student of Andijan State University

Turg'unboyeva Maftuna Oybek qizi
Master's degree student second year of Andijan State University

To'rayev Muhammadjon Uzaqovich
Dean of the Faculty of Pedagogy at Andijan State University - docent

Abstract: *Methods and means of mass measurement in agriculture are of paramount importance. The accuracy of the measurement method is estimated by its error, and the presence of an error leads to significant losses during control. For example, grain weighing during harvesting is carried out on stationary automobile scales. Periodic verification of such scales is carried out at the place of their installation. The measurement error on the certified scales does not exceed one percent, but taking into account the fact that the scales are installed outdoors, they become dirty, corrode, and sometimes the weighing method is not followed. As a result, the measurement error increases significantly.*

Keywords: *elements of modification, physical calculation, sensor to a detectable value*

Description of the principles and methods of mass measurement: A large number of mechanisms for measuring mass and weight include a silo-calculating and computational component. The weight reproduction mechanism includes components for evaluating the response of a mechanized device and displaying a fixed load on a dynamometer - the main component of the computing element, which contains a force measuring device, elements of modification, measurement and fixation. The response power of the sensor occurs where the sensor is located, and it appears under the influence of a force that prevents the fixed.

Sensors with an electrically inactive elastic element are most often used, the transformation procedures and changes of which occur in different components. The most accurate systems of mass measurement devices are mechanical, mechanical-hydraulic and hydraulic force measurement devices.

Mechanical sensors are always used with lever computing mechanisms. The force-measuring hydraulic sensor is a dense amount of coagulated liquid, which is located in separate cells.

To measure the stress-varying mass of elements and installations when using them, a cycle of nutrometry methods is used, their basis is different physical calculation rules.

Wire strain gauges include manganin wires located in a line of loops, these strain gauges are placed on top of the side that changes under the influence of force. The advantages of wire strain gauges are: small parameters, weight and cost, good stability and constancy. The weak side is a small amount of relative resistance conversion and an error related to temperature.

Semiconductor strain gauges are created from components taken from silicon or germanium, with the right amount of additives to create the desired result. Strain gauges are often used for testing equipment for agriculture; their advantage is small parameters and weight, constant properties.

Magneto elastic converters are considered one of the types of electromagnetic converters. The scheme of work consists in the transformation of the magnetic permeability of ferromagnetic elements, taking into account mechanized forces, which are interrelated with the influence of mechanized forces on ferromagnetic elements. In turn, the transformation generates a transformation of the inductance of the coil. Magneto elastic converters have the ability to function as inductive resistances and as transformer devices.

A capacitive converter is a sensor, thanks to which finding a detectable value turns into finding a capacitive counteraction. Its completeness is transformed by finding the electrical value. An inductive converter is a sensor for changing the number of a defined parameter into an inductance parameter. It consists of a coil in which the whole counteraction is transformed by the joint movement of parts of the magnetic wires relative to each other. The differential converter includes several similar single sensors that have a single moving part. Due to the use of differential elements, additive inaccuracy decreases, sensitivity increases several times.

Transformer converters are sensors that change the parameters of the desired parameter into an indicator of the total inductance.

There are several types of inductive sensors: with a transforming counteraction of magnets and the same counteraction of magnets and a moving winding. The accepted magnitude of the magneto motive force has either a small current at a large number of revolutions, or a significant current at a small number of revolutions. When finding the number of revolutions, the magneto motive force and the size of the hole are represented by known values-using the coil. When determining the number of revolutions, it is necessary to combine the counteractions of the sign and the chain according to the rules.

Inaccuracies of inductive sensors are explained by changes in voltage and the degree of heating of the sensor. The absolute method of reducing inaccuracies from external causes is to increase the perception of the sensor to a detectable value, since the perception of the sensor to external causes is not conditioned by the detectable value.

Piezoelectric transducers are sensors that are made of elements with a forward or reverse piezoelectric phenomenon. The direct piezoelectric effect consists in the appearance of electrical potentials at the ends when an acting force influences it, which contributes to the appearance of voltage in the element. The reverse piezoelectric effect is characterized by a change in its parameters when the piezoelectric electric is located in a certain field.

The main features that serve for the selection of measuring instruments are:

- Type of activity;

- Design and dimensions of the studied product;

- The maximum measurement error, normalized for each measuring instrument.

For private and small-scale organizations, it is advisable to have and use universal measuring instruments.

The use of special automatic and mechanized measuring instruments is considered economically and technically advantageous for large-scale and mass production.

High-precision measuring instruments must be used for small products with small tolerances for their dimensions - automatic machines are the most effective, and for large products with large tolerances for their dimensions, measuring instruments of less high accuracy and portable type are used.

Significant factors in the choice of measuring instruments are the permissible measurement error. The value of the permissible error 8 according to GOST 8.051-81 is determined depending on the tolerance for the product, which is associated with the nominal size and quality.

To optimize the choice of measuring instruments, it is necessary to have the following initial data:

1) Nominal value of the measured value;

2) The value of the difference between the maximum and minimum values of the measured value, regulated in the regulatory documentation;

3) Information about the conditions of the measurements.

The sequence of selection of measuring instruments can be systematized in the form of a specific algorithm based on the data presented in. To simplify the calculations necessary for the selection of measuring instruments and to obtain a more accurate economic assessment, it is necessary to use software.

After the previous calculations, the program independently determines the probabilistic percentage of defective parts, losses from correctable and incorrigible defects. In the future, the percentage of usable parts is determined. According to the standard table, the operator independently selects two measuring instruments and enters their measurement errors into the compiler, which affects further calculation. With the help of commands pre-recorded in the program, the relative measurement error and the standard deviation of the measurement error are calculated.

It is especially difficult to control the dimensions of parts in the conditions of technical service enterprises, since it is necessary to measure not only new products, in the form of spare parts, but also the repair fund - worn parts. Ensuring the quality of repair of agricultural machinery in modern dealerships of domestic manufacturers is possible only by entering control operations. Modern organizational approaches to metrological support of repair production require reasonable assignment of controls. The company's standards for metrological support of works, maintenance and repair of equipment should include a list of measures that ensure the unity and required accuracy in the measurement management.

A methodology has been developed to assess the cost-effectiveness of the quality control of the dimensions of parts using universal and special measuring instruments. The application of the methodology allows you to evaluate the effect and compare the new measuring instrument with the basic one, taking into account the cost of the measuring instrument, measurement losses and control costs.

Literatures:

1. Shkaruba N.Zh. Theoretical foundations for calculating economic losses associated with control errors in repair production // Vestnik FGOU VPO MGAU 2005. No. 1 (11). pp. 34-37.

2. Shkaruba N.Zh. Development of a comprehensive methodology for the selection of measuring instruments of linear dimensions in the repair of agricultural machinery. Dis. ... Candidate of Technical Sciences. M., 2006. 156 p.

3. Leonov O.A., Antonova UY. The choice of universal measuring instruments for the control of cylinder liners during selective assembly // Tractors and agricultural machinery 2017. No. 6. pp. 52-57.

4. Shkaruba N.Zh. Calculation of probabilistic characteristics of the distribution of joints of mating parts. Certificate of registration of the computer program RUS2018610933. 27.11.2017.