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CURRENT TENDENCIES IN THE DEVELOPMENT OF METROLOGICAL SUPPLY OF MEASURING INSTRUMENTS

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A B S T R A C T

Today, the metrological supply of measuring instruments in our country is undergoing major changes. Uzbekistan's new rules for becoming a member of the global trade system will further expand new aspects of export potential. Laws that allow us to raise the competitiveness of our country to a new level are considered very important. A number of main directions for consideration in the field of metrological provision of measuring instruments are presented.

K E Y W O R D S

Product quality, sensor, transducer, output signal, risk of defects, measuring instruments, terminology, plateau, calibration procedure.

Introduction

At each stage of the development of human society, human activity undergoes great changes. In everyday human life, where new technologies and developments are introduced, they are increasingly automated, but at the same time, they are not without flaws in terms of reliability and quality [1].

Achieving a high level of product quality and ensuring the accuracy and interchangeability of metrological service capabilities during operation is considered very important today [2].

A sensor is a structurally separate device that includes one or more basic measurement transducers.

Figure 1: Sensor sensor scheme

Self-monitoring of the sensor - automatic verification of the metrological serviceability of the sensor during its operation, as well as a special additional parameter of the output signal produced by the device (measuring probe) installed on the sensor. the received reference value is reflected in the device [3].

The main task facing metrology is to increase the calibration range:

This becomes a necessity in connection with the creation of long-term equipment, in turn, without human intervention for several years [4].

The use of sensors with metrological self-management increases the role of influencing factors. This leads to the risk of malfunction.

A contradiction arises. To reduce equipment wear and tear and to reduce the risk of defects and accidents, metrological serviceability of measuring instruments should be checked and used more frequently [5].

Taking into account the globalization of the market of measuring instruments and metrological services, it is necessary to try to ensure that the requirements established in national standards take into account foreign experience and contribute to the formation of the international regulatory legal framework.

The main problems and directions of development of metrological provision of measuring instruments for Uzbekistan and all countries of the world are as follows:

- ✓ standardization of terminology,
- ✓ systematization of metrological self-control methods, standardization of test methods.

Developers and consumers of measuring instruments must all have a common language of communication. Due to the rapid development of scientific and technical progress, a common language enhances the progress of science and technology, brings countries to the same position in terms of high-quality product production and fair competition [6].

Systematization of metrological self-management methods should help speed up the development of new measurement tools with metrological self-management;

This direction is related to the standardization of requirements for measuring instruments with metrological self-management. Obviously, the reliability of its results may vary depending on the decisions made by the developer.

The metrological self-control performed on the sensor must be reflected in the documentation.

The third direction is related to the standardization of test methods that prove the conformity of metrological self-control properties to those possible using only technical tools, rules and standards [7].

Unit and required measurement accuracy

The main trend in recent decades is to reduce operational costs for metrological provision of measuring instruments. This is done by introducing automatic metrological self-control - sensors installed on documents. The standard should ensure comparability of sensor parameters and promote interchangeability of products from different manufacturers.

All metrological self-testing methods and metrological diagnostics are divided into self-testing.

With metrological self-checking methods, a high-precision (standard) tool should be more metrological.

The reliability of metrological serviceability with respect to the main measuring device that is controlled. The simplest example of the organization of metrological self-checking methods for temperature measurement is a sensor, which includes a capsule embedded with metal, taken as a melting point. As the metal melts or solidifies, the rate of change of measured temperature decreases significantly, forming a "plateau" in the temperature-time diagram. It is determined based on the deviation of the temperature measured at the melting (solidification) point of the metal from the reference value.

Evaluation of metrological serviceability of the sensor.

For SI with metrological self-checking methods, it is mainly determined by the instability of the standard. Metrological self-test methods are similar to the automatic calibration procedure [8].

It involves combining the main and additional measurement transducers, which are similar in accuracy and metrological reliability, but differ in their sensitivity to the effects of quantities that create a significant component of error. For example - a pressure sensor with a Bourdon tube. An important component of the error is related to residual deformations that occur during operation. The pressure is measured by the movement of the free end and is additionally determined by moving the -intermediate point.

In short, the main solution to metrological issues will be a timely regulatory framework created together with other metrologists of the world to provide measuring instruments. Due to the great changes that have taken place in the country, our experts have to revise all existing GOSTs and create many new documents in the field of metrology and standardization.

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