

# DEVELOPMENT OF THE GENETIC CERTIFICATE OF THE FUNCTIONAL CLASS OF ELECTRIC MOTORS ON THE BASIS OF "GENETIC MEMORY" OF REAL ELECTROMECHANICAL OBJECT

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**Introduction.** Genetic certification is one of the tasks of research in the field of electromechanics. Development of a genetic certificate of an arbitrarily studied functional class of electromechanical energy converters with the possibility of a clearly structured presentation of information is necessary for the creation of various databases, and the possibility of structural prediction provides the realization of search design on a uniquely defined set of structures of the studied class. Preliminary research results show that electromechanical objects and systems are carriers of genetic information that is uniquely recognized through the structure of the object and reproduced as a universal genetic code [1]. Genetic information plays a key role in understanding the principles of structural organization and evolution, not only in wildlife but also in electromagnetic systems. Knowledge of genetic information is a prerequisite for the reproduction of genetic programs that focus highly intelligent information on the structural potential of electromechanical objects. The results of the decoding of genetic programs open the possibility of creating highly effective genetic banks of innovation and genetic knowledge bases. Therefore, the tasks of identification, analysis and practical use of the innovative potential of genetic programs that determine the genetically acceptable structural diversity and systemic properties of objects-descendants within specific functional classes of EM-systems, are relevant to the current scientific and technical problems of modern electromechanics.

**The aim of the work.** Development of the structure of the genetic certificate of the functional class of electromechanical energy converters and filling it with information based on the definition, recognition and decoding of a set of genetic programs using the "genetic memory" of the selected electromechanical object from the results of information search.

**Materials of research.** In accordance with stated aim of the work the main objectives of this study are following: 1) to develop an algorithm for analyzing the information of the selected electromechanical object to create a genetic passport of the studied functional class; 2) to analyze the historical and technical information of the DC motor selected as a representative of the functional class, in particular to determine the information on passport data and functional identity; 3) to identify and analyze the genetic information of the investigated EM object; 4) to analyze and make the choice of the optimal way of presenting the genetic passport information of the studied functional class based on the use of the "genetic memory" effect of a real electromechanical object.

An arbitrary object of a genetically organized system has a kind of "genetic memory" that allows, through its genetic information, to determine its location and the structure of the system that produces it. As a carrier of genetic information about

its system, it is also part of its genetically predicted offspring. The property of the magnetic structure to store such information, by analogy with systems of biological origin, can be generalized to the concept of "genetic memory". Therefore, genetic memory is a systemic, genetically determined property of an arbitrary EM object, manifested in its ability to store in its structure genetic information about its generative structure (the parent electromagnetic chromosome), as well as its location in the periodic system [2].

Therefore, genetic memory characterizes the fundamental property of an arbitrary object to perform the function of the carrier of genetic information, ensuring its connectivity, integrity, stability and continuity of existence of genetic information in time. According to the provisions of the theory of genetic evolution, an arbitrary EM-object, regardless of the time of its creation (evolution), the level of structural complexity, functional and taxonomic affiliation, retains in its structure genetic information about its origin and belonging to its functional class. The genetic information of an object is reflected by the universal structure of the genetic code, which contains information about the identity of the object, the generating system and its taxonomic status. This means that there is a deterministic information link between an arbitrary object, its genetic program and an evolving functional class, which is realized through vertical flows of genetic information. The practical use of the effect of genetic memory is realized through interrelated procedures of genetic analysis and direct synthesis based on the information of a single representative of the studied class. In systems of anthropogenic origin, the carriers of genetic information may be representatives of real objects, as well as books, articles, patents, descriptions and drawings of objects of the historical past, museum exhibits, etc. [2].

In accordance with the tasks of this study, an engine from the laboratory fund of the Department of Electromechanics was selected as the real representative of the functional class of electromechanical energy converters (Fig. 1). An algorithm for analysis of information (Fig. 2), presented by the selected electromechanical object, was developed and implemented.

Analysis of the genetic information showed that the engine under study belongs to the specie of CL 0.2 y, which gives grounds for establishing its ancestral and ancestral accessory, with the possibility of further decoding of the relevant genetic programs.

As a result of the algorithm implementation shown in Fig. 1 it is determined that the electromechanical object selected is a asynchronous motor of the rotating and progressive motion, mainly used on robototechnic systems for realization of rotating and progressive motion of certain mechanisms. The size is determined by the outer diameter of the anchor.

According to the objectives of the study, a choice was made of the method of submitting information of the genetic passport of the functional class, the information components of which were determined by the proposed algorithm using the effect of "genetic memory". As a result, the method of submitting information in the form of a Quick Response Code [3], which emerged as a trademark for the type of matrix bar codes (two-dimensional bar codes) developed for the Japanese automotive industry, was selected.

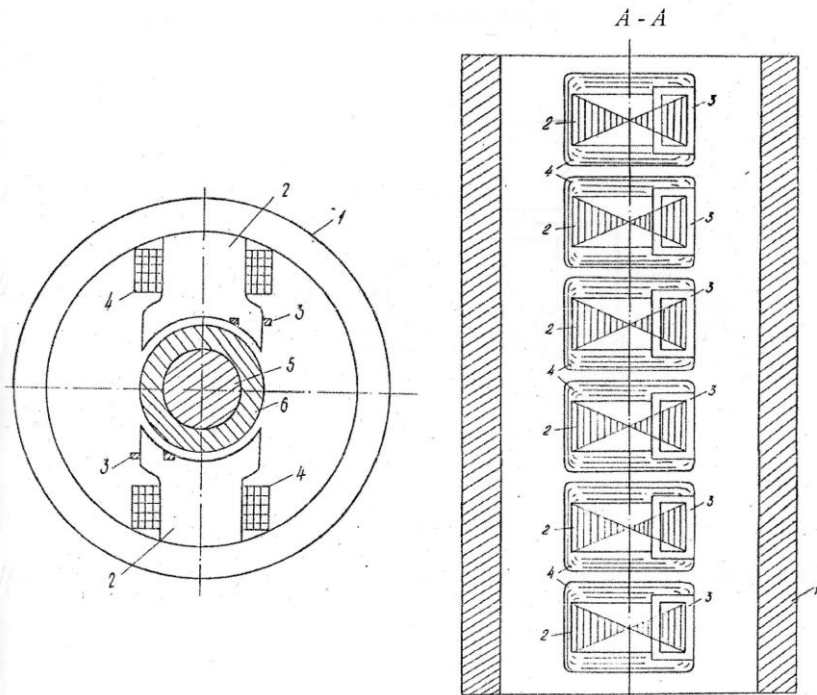


Figure 1 – The real electromechanical object selected for the development of a certificate of the studied functional class

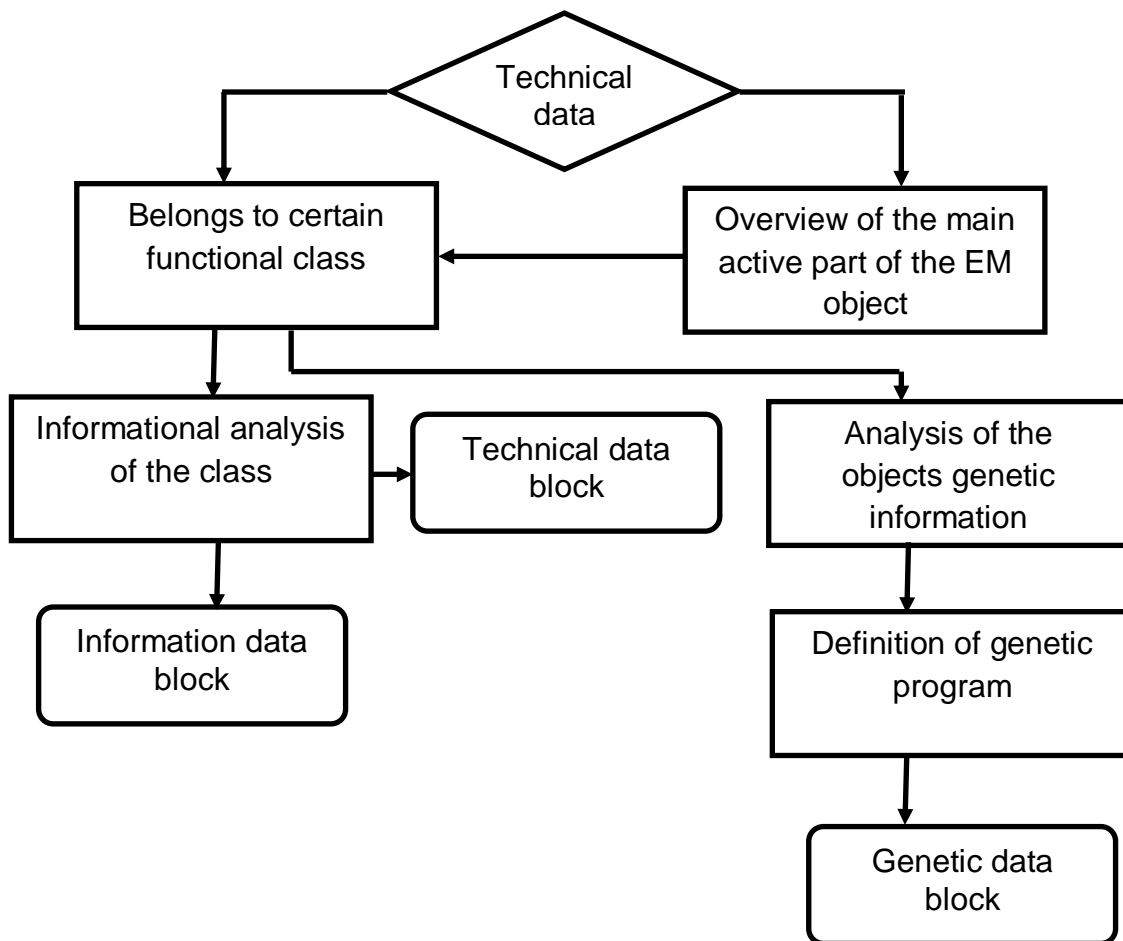


Figure 2 – Algorithm of information analysis of the real representative of the studied functional class of electromechanical energy converters

**Conclusions.** According to the results of the study it was proposed the algorithm of information analysis of the real representative of the studied functional class of electromechanical energy converters is implemented. The historical and technical information of the selected electromechanical object, such as series membership and passport data of the asynchronous motor of rotating and progressive motion, has been established. According to the results of genetic analysis, the object under study is representative of the CL 0.2 y specie. The method of submitting information contained in the genetic passport of the studied functional class is the method of Quick Response Code.

#### References

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