

SUMMARY

The master's dissertation comprises: 116 pages, 46 figures, 30 tables and graphical part on 6 pages A4.

The purpose of the work is to develop and study the performance and efficiency of a pump based on artificial intelligence in terms of energy-efficient control of connected pumps.

In the work an analytical review of the features of structures and the principle of operation of the centrifugal pump is carried out, the modes of operation of multi-aggregate pumping installations are analyzed, scientific researches of the efficiency of the centrifugal pump in speed regulation and energy-efficient predictive control of centrifugal multi-aggregate pumping stations are reviewed, the principle of construction of neural circuits is performed.

The pump is selected, its capacity is calculated and the drive motor, frequency converter, soft starter according to the pump power are selected. Basic mathematical models of induction motor, serial connection of pumps are given. A detailed description of the step-by-step creation of a neural network in the Matlab Simulink application package. The performance appraisers and efficiency were developed, their training and performance checks in the variation of hydraulic network parameters for two cases.

TURBOMECHANISM, EVALUATOR, PUMP INSTALLATION, PRODUCTIVITY, PRESSURE, METHODOLOGY, TECHNOLOGICAL PARAMETERS, NEURAL NETWORK, HYDRAULIC RESISTANCE, NEURAL NETWORK, HYDRAULIC RESISTENCE, STABILIZERS, ENERGY EFFICIENCY.

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