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ENERGY-EFFICIENT CONTROL OF PUMP UNITS BASED ON NEURAL-NETWORK PARAMETER OBSERVER

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Abstract

An observer based on an artificial neural network was designed. The observer determines the pumping unit performance depending on the operating point. Determination is based on the measured technological coordinates of the system and the pressure of the turbomechanism. Three neural networks were designed for three types of the productivity observer. The developed observer was investigated by the simulation method within different variations of disturbing actions, such as hydraulic resistance of the hydraulic system and geodetic pressure. A comparative analysis of three types of the productivity observer, built with using the pressure and different signals of the system with arbitrary change of hydraulic resistance was given. By the use of the pump unit efficiency observer, in addition to the results presented earlier, the efficiency of the productivity observer, which built with using different sensors, in water supply systems with two series-connected pump units, operating for filling the large tank, is

researched. In the water supply system one pump speed is regulated, the other is unregulated. References 14, figures 5.

Key words: pumping unit, neural network, observer, parameter, turbomechanism.

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