DOI: https://doi.org/10.15407/techned2016.05.038

POWER EFFECTIVE MODES ELECTROMECHANICAL SYSTEM OF PUMP INSTALLATION OF THE MULTISTOREY BUILDING

Journal Tekhnichna elektrodynamika

Publisher Institute of Electrodynamics National Academy of Science of Ukraine

ISSN 1607-7970 (print), 2218-1903 (online) Issue № 5, 2016 (September/Oktober)

Pages 38 – 45

Authors

O.V. Bibik¹, O. M. Popovych¹, S. P Shevchuk²

- ¹ Institute of Electrodynamics National Academy of Science of Ukraine,
- pr. Peremohy, 56, Kyiv-57, 03680, Ukraine,
- e-mail: popovich1955@ukr.net
- ² National Technical University of Ukraine «Kyiv Polytechnic Institute»,
- pr. Peremohy, 37, Kyiv, 03056, Ukraine

Abstract

Mathematical models (MM) for complex research and definition of actions for increase of energy efficiency of the modes of electromechanical system of pump installation of a multystoried house are developed. MM consider changes: a pressure and efficiency of the pump depending on giving and the frequency of rotation; the induction motor's parameters and losses for various operating modes; optimum(minimum sufficient) value of a pressure of the pump which corresponds to a minimum of losses of energy in hydraulic gates of the consumer. The methodology of definition of coefficient of energy efficiency is developed. The expediency of

application of coefficient of energy efficiency when forming laws of regulation of pump installation of a multystoried house is proved. References 11, figures 4, tables 2.

Key words: induction motor, pump installation of the multi-storey building, energy efficiency.

Received: 12.02.2016 Accepted: 13.04.2016 Published: 13.09.2016

References

- 1. Balagurov V.A. Design of special electrical machines of alternating current. Moskva: Vysshaia shkola, 1982. 272 p. (Rus)
- 2. Vozdvizhensky V.V., Kiselev V.I. Installation of frequency and adjustable drives on electric motors of pumps of cold and hot water supply of CHU. Available at: http://www.energosovet.ru/stat461.html. (accessed 09.02.2016) (Rus)
- 3. Klevtsov A.V. Means of optimization of consumption of an electric power. Moskva: SOLON-Press, 2004. 240 p. (Rus)
- 4. Kravchik A.E., Shlaf M.M., Afonin V.I., Sobolenskaia E.A. Induction motors of a series 4A. Moskva: Energoizdat, 1982. 504 p. (Rus)
- 5. Kravchik A.E., Strelbitsky E.K., Shlaf M.M. Selection and use of induction motors. Moskva: Energoatomizdat, 1987. 96 p. (Rus)
- 6. Leznov B.S. Energy saving and the adjustable drive in pump and pressure-blowing installations. Moskva: Energoatomizdat. 2006. 360 p. (Rus)
- 7. Muravleva O.O., Tiuteva P.V. Use of energetically effective engines in the adjustable drive of pumps. *Vodosnabzhenie i Sanitarnaia Tekhnika*. 2008. No 5. P. 29–32. (Rus)
- 8. Popovych O.M. Mathematical model of asynchronous electric machine for mechatronic system simulation and structural modeling. Tekhnichna Elektrodynamika. 2010. No 4. P.

25-32. (Ukr)

- 9. Sarach V.M., Bastunsky A.M. Production and natural tests of pump units with frequency converters. *Elektrotekhnika*. 1995. No 7. P. 19–20. (Rus)
- 10. Radin V.I., Londin Y., Rozenknop V.D. Unified series of induction motors of Interelektro. Moskva: Energoatomizdat, 1990. 416 p. (Rus)
- 11. Shevchuk S.P., Popovich A., Svetlitsky V. Pump, fan and pneumatic installation. Kyiv: National Technical University of Ukraine Kyiv Polytechnic Institute, 2010. 308 p. (Rus)

PDF