Emro Science and Education
International open-access scientific journal
Journal homepage: https://journal.emro.uz

OPEN ACCESS

CONFERENCE PAPER OPEN ACCESS

Vol. 1 No. 1 (2023) · "Axborot oqimlari va intellektual tizimlarning ijtimoiy, iqtisodiy va texnik-texnol... DOI: 10.5281/zenodo.24318537

Xalqaro ilmiy-amaliy anjuman materiallar to'plami *Andijan 2023 yil 10-noyabr*

ANALYSIS OF ELECTRICAL AND MECHANICAL CONDITION MONITORING OF ASYNCHRONOUS MOTOR SUPPLIED FROM SOLAR PANEL ENERGY SOURCE.

llhomjon Khakimovich Siddikov, tech. doctor of sciences, professor

[1]Tashkent Institute of Irrigation and Agriculture

"Institute of Mechanization Engineers"

Azamov Saidikrom Saidmurodovich, supporting doctoral student

Andijan Machine Building Institute

Abstract: In today's era of digital technology and artificial intelligence, the demand for electricity generation and all types of energy is increasing day by day, in which the importance of renewable energy sources occupies a special place. the possibility of transferring it to the energy supplied by means of it is considered one of the most advantageous aspects, today the most electric power-consuming device of consumers of solar energy sources, as well as conditional energy resources, is asynchronous motors, one of the three phases of asynchronous motors It is important to study the differences between physical, mathematical and magnetic processes in it from three-phase, its mechanical characteristics, and to introduce the brands of asynchronous motors for the energy produced by the solar panel into production. When one and three-phase asynchronous motors are connected to solar energy sources in an off-line and on-line system, the power consumption is changed to a signal form through electromagnetic current converters in the control and management, and the consumed electric power is transferred to the primary o The results of modeling of the effects of signal change magnitude and parameters on the physical and technical processes taking place in gartkichi, based on the structure of the change device are presented.

Key words: single-phase motor, mechanical characteristics, electric power, pulsating magnetic flux, multi-section part, phase shift.

A single-phase motor consists of a fixed stator and an excited (rotating) short-circuited and winding rotor, which is efficient when supplied with solar energy. A multi-section coil is placed in the stator, and the working frame occupies two-thirds of the stator slots. When we connect the stator coil to a single-phase source, alternating current creates a pulsating magnetic field. The magnetic field vector is perpendicular to the plane of the stator phase windings in space and is fixed and variable in value and direction. To understand the principle of operation of a single-phase asynchronous motor, we divide the pulsating magnetic field vector into two homogeneous magnetic field vectors rotating in the direction of travel. The amplitude of the resulting magnetic field is equal to half of the current of the pulsating magnetic field, that is, we replace the single-phase stator winding with two three-phase windings with different phase sequences and connected to a common three-phase source.

Published: 10.11.2023

Cite this article: Ilhomjon Khakimovich Siddikov, Azamov Saidikrom Saidmurodovich (2023). Analysis of electrical and mechanical condition monitoring of asynchronous motor supplied from solar panel energy source. Emro Science and Education, 1(1). https://doi.org/10.5281/zenodo.24318537

© 2023 The Author(s). Published by Emro Science and Education. This is an open access article.

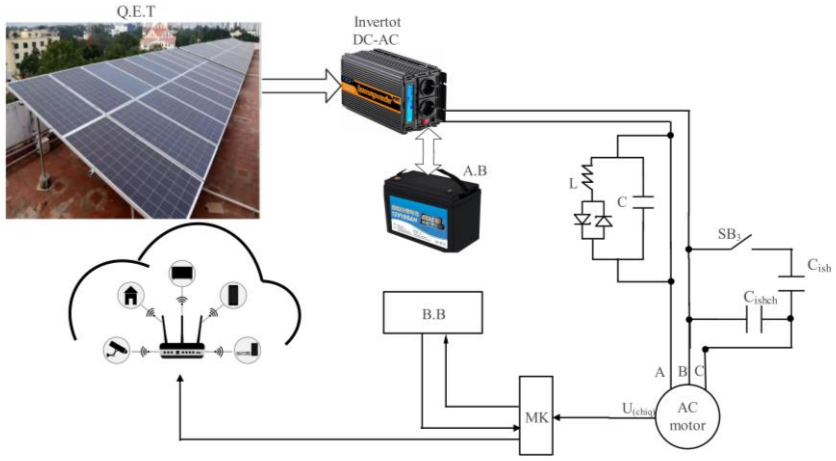


Figure 1 Description of a single-phase asynchronous motor control system powered by a solar energy source

Above is the order of changing the phases. One is A-B-C, and the other is A-C-B. The rotating magnetic fields in the direct and reverse sequence of the stator coils induce direct and indirect currents in the rotor. Consequently, single-phase motors the study of its operation can be replaced by the study of the same three-phase motor with two common rotors. As a result, the starting torque in the motor is zero. Therefore, when we connect the single-phase asynchronous motor to the source, its fixed rotor cannot rotate independently. This is one of the main disadvantages of the single-phase asynchronous motor. It requires an additional device.

When constructing the mechanical characteristics of a single-phase asynchronous motor, the mechanical characteristics of the two "three-phase" motors are used. and we consider it as "reversed".

$$S_{to`g`} = \frac{n_{tog'r} - n}{n_{tog'r}} = \frac{n_{o-n}}{n_o} = 1 - \frac{n}{n_o} (1)$$

So, as the engine accelerates, the slip decreases, and the moment M increases to a certain value, And the slip of the rotor with respect to the reverse magnetic flux

$$S_{to'g'} = \frac{n_{o\ tesk} + n}{n_{o\ tesk}} = \frac{n_o + n}{n_o} = 1 + \frac{n}{n_o} \quad (2)$$

Taking (1) into account, we derive the following.

$$S_{tesk} = 2 - S_{to'g'} \quad (3)$$

An increase in S_{tesk} causes an increase in the frequency of the rotor current and inductive resistance of the rotor coil, as a result of which the torque M_2 decreases.

The value of the total torque resulting from the effect of the "direct" and "reverse" fields is equal to the algebraic sum of the moments M1 and M2, and the direction value is in the direction of the larger moment ladi. The stationary part of an asynchronous machine is called the stator, and the moving part is called the rotor. The thickness of

the stator and rotor magnetic cores (0.35 \div 0.5 mm) is made of electrotechnical magnetic mild steel. Both sides of these steel plates are coated with an oil-based rosin varnish before the magnetic core is cast.

In short, it is considered appropriate to introduce modern digital technologies to control and control the amount of electricity generated from solar energy and its consumers, the consumption of electricity and the working condition of the device, and the use of the most effective methods.

References:

1. Chemical technology control and management 2023, №4 (112) pp.21-27/ /https://ijctcm.researchcommons.org/journal/vol2023/iss4/4/
2. Namangan muhandislik texnologiyalari ilmiy texnik jurnal volume 8.insse 1, 2023.// http://niet.uz/index.php/nj/article/view/46.
3. IOP Conference Series: Earth and Environmental Science// 1142 (2023) 012023
IOP Publishing doi:10.1088/1755-1315/1142/1/012023, article online.
4. Science and innovation international scientific journal volume 2 issue 3 march 2023.uif-2022:8.2/issn:2181-3337.scientists.uz// https://cyberleninka.ru/article/n/research-of-energy-consumption-control-of-renewable energysource-byconsumers.
5. Siddikov IX Boykhanov Z. U. Karimjonov DD "Elements And Devices For Monitoring And Control Of Energy Efficiency". The American Journal of Engineering and Technology (ISSN – 2689-0984) Published: September 29, 2020 | Pages: 136-148.
6. Siddikov IX, Boykhanov Z. U, Maksudov MT, Uzokov. R. Features production of reactive power on systems of electrical supply with renewable energy sources. Academicia: an international multidisciplinary research journal vol. 10, issue 6, June 2020 PaGES: 292-29
7. Аъзамов С.С., Узаков Р., Давкаралиев Э.А.// Перспективы производства и использования энергии биогаза сегодня, Modern scientific researches and innovations № 1 (117) January 2021 ISSN 2223-4888.
8. Azamov S.S The American Journal of Engineering and Technology / The Prospects Of The Construction Of Hydroelectric Power Plants In Uzbekistan And The Issues Of Increasing Their Number And Widespread Use//(ISSN – 2689-0984), Published: November 29, 2020 | Pages: 118-121,Doi: https://doi.org/10.37547/tajet/Volume02Issue11-19 https://inlibrary.uz/index.php/tajet.

TEXNIKA TA’LIM YO‘NALISH TALABALARGA LABORATORYA MASHG`ULOTLARINI OLIB BORISHNING ZAMONAVIY USULLARI (MASHINA MEXANIZMLAR NAZARYASI FANI MISOLIDA)

Jalilova Gulnoza Xabibullo qizi, Assistent, Farg‘ona politexnika instituti
Xamidjonov Axliddin Komiljon o`g`li, Student, Farg‘ona politexnika instituti

Annotatsiya: Ushbu maqolada oliy ta’lim muassasalari texnika yo‘nalishi talabalarini “Mashina mexanizmlar nazaryasi” fanidan laboratoriya mashg‘ulotlarini bajarishda faol uslublarni to‘g‘ri tanlash va muammolarni etarli darajada tushuntirish usullari yoritilgan.

Kalit so‘zlar: Interfaol, texnologiya, trening, respondent, noan’anaviy, induvidual, optima

Kirish

“Mashina mexanizmlar nazaryasi” fanidan laboratoriya ishlarini bajarish o‘quvchi ma’ruza va amaliy mashg`ulot darslarida o‘tilgan mavzular hamda faoliyati jarayonida uning oldiga qo‘yilgan nazorat va amaliy topshiriqlarni harakatlantiruvchi kuch hisoblanadi. “Mashina mexanizmlar nazaryasi” fanida laboratoriya ishi bajarishda faol uslublarni to‘g‘ri tanlash muammosini etarli darajada tushunmaslik hollari uchraydi. U yoki bu uslub optimalligi uning atalishi odatdagicha bo‘lib qolinganligi bilan emas, balki bajariladigan laboratoriya ishi mazmuniga mosligi, o‘quvchi imkoniyatiga muvofiqligi bilan baholanadi. Eng maqbul tanlangan uslublar qo‘yilgan muammoni belgilangan vaqtda ijobiy hal qilish imkonini beradi.

O‘qituvchi “Mashina mexanizmlar nazaryasi” fanida laboratoriya ishini bajarishni rejalashtirishda va noan’anaviy uslublarni tanlashda quyidagilarni amalga oshirishi zarur:

- Laboratoriya ishini bajarish bo‘yicha ko‘rsatmalar bilan tanishib chiqib, uni bajarish maqsadi va vazifalarini belgilab olish;
- Laboratoriya ishini bajarish bo‘yicha asosiy talablar: laboratoriya ishini bajarishda o‘quvchi qaysi asosiy tushunchalarni, hodisalarni, jarayonlarni, qonunlarni, nazariyalarni bilishi, nimalarni hal qila olishi kerakligi bilan tanishib chiqib, laboratoriya ishini bajarishdan kutiladigan natijalarni oldindan aniqlab olish;
- O`quv rejasi bilan tanishib, zarur bo‘lsa, unga o‘zgartirish kiritishi, bajariladigan laboratoriya ishlarini tasniflab chiqish;
- Har bir laboratoriya ishini bajarish uchun etarlicha vaqt ajratib, dasturda nazarda tutilgan fanlararo aloqadorlikdan foydalanish, mazkur tajriba ishi mazmuni va vazifalarini rejalashtirish;
- laboratoriya ishini bajarishda zamonaviy texnologiyalar va uslublarni tanlash;
- O`quvchining umumiy, kichik guruhda va induvidual holda laboratoriya ishini bajarishini uyushtirish shakllarining o‘zaro mos birlashmasini tanlash;
- Dars jarayonida tanlangan variantni qo‘llab, laboratoriya ishini bajarish uslubi va shakllariga zarur tuzatishlar kiritib borish.

Muhokama va natijalar Jamiyat rivojidagi ilmiy-texnikaviy taraqqiyot ishlab chiqarishni texnologiyalashririshga olib keladi. Hozirgi davrda texnologiyalashrirish