AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Technology and Applied Sciences
ISSN (E): 2832-1766 Volume 30, November - 2024

TESTING SOLAR PANELS ENTERING UZBEKISTAN

Shog‘uchqarov Sanjar Qodir o‘g‘li,
Eshmirzayev Sodiqjon Erkinboy ugli,
Fayzulloyev Abdulla Qahramon o‘g‘li,
Abdufattoyeva Elnuraxonposhsho Murodjon qizi
Tashkent State Technical University named after Islam Karimov
e-mail: sanjar4242@inbox.ru

ABSTRACT

The increase in the demand for electricity in our country and the use of organic fuels for the production of electricity lead to global pollution of the environment. As a result, human life is seriously damaged. Therefore, one of the serious and urgent problems facing humanity is to provide environmentally friendly energy to all types of energy consumers. Therefore, the need for solar panels and collectors is increasing, and the requirements for its quality are also increasing. Currently, it is necessary to develop the basic and conceptual design of the laboratory for testing photoelectric modules, to equip it with more than ten modern measuring devices based on the requirements of international standards. By establishing a solar panel certification system, we will prevent the influx of the aforementioned substandard solar panels.

KEYWORDS

Solar panels, certification, accreditation, quality, test control test.

Introduction

Currently, the development of society is determined by the fact that it is endowed with stable and high-quality energy. But the day-to-day increase in energy demand, as well as the use of organic fuels for its production, leads to global pollution of the environment and, as a result, seriously disappoints human life. In the world of people and animals, a whole new type of disease is emerging. Therefore, one of the serious urgent treats facing humanity is the provision of environmentally friendly energy to all types of energy consumers. In many countries, including Uzbekistan, the energy deficit can be partially supplemented by the use of renewable energy sources that are environmentally sustainable and affordable to consumers. Given the significant potential of solar energy in Uzbekistan, it is advisable to use solar energy for the production of electricity on an industrial scale. This is confirmed by the development and promising programs of the photovoltaic solar station (FQS), both abroad and in Uzbekistan [1,3]. Decree of the president of the Republic of Uzbekistan No. 16.02.2023 PQ-57 on measures to accelerate the introduction of renewable energy and energy-saving technologies in 2023, according to which the widespread introduction of renewable energy sources in the social and housing

and communal services sectors and in the sectors of the economy. The decision to ensure the compensation of energy deficit in the regions of the Republic by increasing energy efficiency, the complex organization of work in this regard, the introduction of favorable conditions and incentive mechanisms for investors is a clear example of our above ideas[1]. In accordance with the decisions of our president, many international treaties and agreements have been implemented in cooperation with foreign countries. To date, large solar photovoltaic plants have been launched in Fergana, Samarkand, Jizzakh and Surkhandarya regions.

Literature Analysis

First of all, the structures, materials of solar photovoltaic panels differ, depending on the principle of operation and the manufacturing process. Unfortunately-the absence of enterprises for the serial production of photoelectric changers, panels and components based on modern technologies. Legislation has been passed by our government that encourages the use of renewable energy sources. However, the fact that there is a problem with solar panels and in order to prevent the entry of this type of poor-quality products into the territory of the Respuplikasi of Uzbekistan, according to Resolution No. 13 of the Cabinet of Ministers of the Republic of Uzbekistan dated 08.01.2024, it was limited to this decision to have a certificate confirming that

Research Methodology

By now establishing the solar photovoltaic panel certification system in our country, we will have prevented the entry of the aforementioned poor quality solar photovoltaic panels. It is from them that there are internationally recognized standards that can directly demand solar photovoltaic panels; GOST IEC 61730, GOST IEC 61215, GOST IEC 62941. For example, we can perform several quality control tests of solar panels in accordance with the international standard GOST IEC 61730-2:2016. For example, we can check the thin-layer insulation of photoelectric panels, the thickness of the thin film. Volt-amper feature, we can see the resistance of the insulation of the panels. This type of testing is carried out using structures that have passed control test accreditation, calibration testing in the test labaratory[4,5].

Analysis and Results

One of the main test tests that show the quality of solar panels is to check the Volt - Ampere nature. This test process is carried out mainly under normal conditions, i.e. (1000±100) W / m2 (which requires 1000W of light energy per meter of surface), the average temperature of the panel (25±2)°C, and the spectral composition of the light would have to be AM 1.5[2.5].

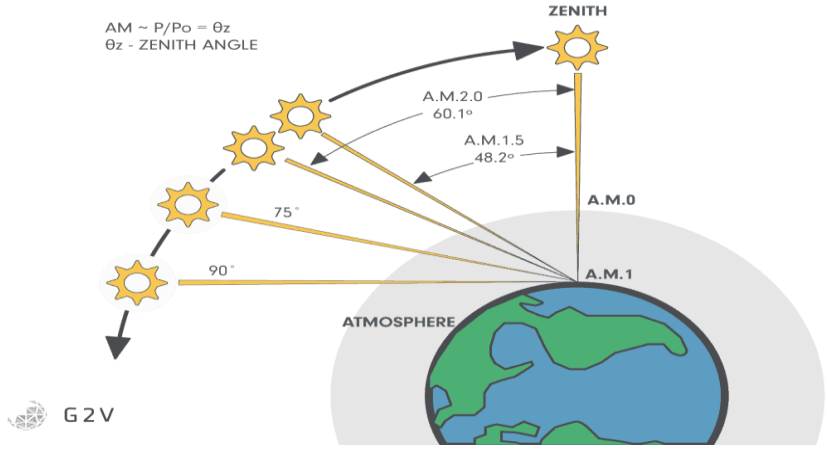

Figure 1. At different altitudes relative to the horizon, the atmospheric transition distance of solar radiation is AM.

By testing the volt-Ampere property, we make it possible to determine the current, voltage, power and as well as the useful work coefficient that emits photoelectric panels at the expense of the absorbed energy. After the Test control test, we will be able to determine whether our photoelectric panel is suitable for use or not by comparing all the obtained values with the magnitude values indicated on the sun photoelectric panel marker.

One of the requirements for another solar photovoltaic panel is its insulation resistance. From the requirement put in this, the purpose is checked for the isolation of the voltage or current generated in the photoelectric panels from passing through the body part or outside of the photoelectric panel. Of course solar photovoltaic panels are divided into different classes depending on their characteristics. For photoelectric panels with a working surface less than 0.1 m2, the insulation resistance will be no less than 400mω,for photoelectric panels with a working surface greater than 0.1 m2, 40mω*m2 i.e. if we have a solar photoelectric panel with a surface of 2 m2, the resistance of its insulation will be no less than 80mω[4.5].

Due to the fact that Uzbekistan has more high-temperature days mainly during the year, solar photovoltaic panels entering our country will definitely have to be tested for high temperature and high humidity resistance. According to IEC 61215-2:2016, a Test Test should be carried out, according to which photoelectric panels are carried out in special temperature-controlled chambers, and the temperature inside it should be (85±2)°C and humidity (85±5)%, this process is carried out for an average of 200 hours[5].

Figure 2. Automatic temperature control climate camera

With this camera, it allows you to fulfill several climatic requirements imposed on the above-mentioned photovoltaic panels.

Conclusion

In accordance with the decisions of our president, many international agreements and agreements are being implemented in cooperation with his foreign countries. Development of the base and conceptual design of the laboratory for testing photovoltaic modules, equipping them with more than ten modern measuring devices based on the requirements of international standards. By establishing the solar photovoltaic panel certification system, we would have prevented the entry of the aforementioned poor quality photovoltaic panels.

References

1. O‘zbekiston Respublikasi Prezidentining “2023-yilda qayta tiklanuvchi energiya manbalarini va energiya tejovchi texnologiyalarni joriy etishni jadallashtirish chora-tadbirlari to‘g‘risida” 2023-yil 16-fevraldagi PQ-57-son qarori.
2. K.K. Zainutdinova Solar Energy Marketing in Uzbekistan. Monograph. Publishing house "Fan" of the Academy of Sciences of Uzbekistan. P.-186
3. I.A. Yuldoshev, K.K. Tashmatov, E.B. Saitov, Bernd Wurl. Introduction and operation of the solar photovoltaic station integrated with the local electrical network // Geliotekhnika, 2017, No. 4. P. 59-62.
4. ГОСТ IEC 61730-2:2016 Межгосударственный Стандарт
5. ГОСТ IEC 61215-2:2016 Межгосударственный Стандарт
6. O‘zbekiston Respublikasi Vazirlar Mahkamasining, 08.01.2024 yildagi 13-son qarori.