

## FOTO-ISSIQLIK-TERMOELEKTRIK GENERATORLAR

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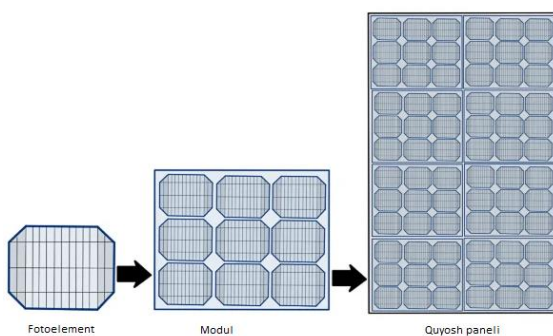
**Annotatsiya:** Mazkur ishda foto-issiqlik-termoelektrik generatorni tashkil etuvchi qurilmalar, quyosh batareyasi, quyosh paneli - fotoelektrik o'zgartirgichlarning birlashtirilgan to'plami - quyosh energiyasini to'g'ridan-to'g'ri elektr tokiga aylantiradigan yarim o'tkazgichli qurilmalar batafsil ko'rib chiqilgan.

**Kalit so'zlar:** foto-issiqlik-termoelektrik generator, quyosh paneli, fotoelement, termoelektrik generator.

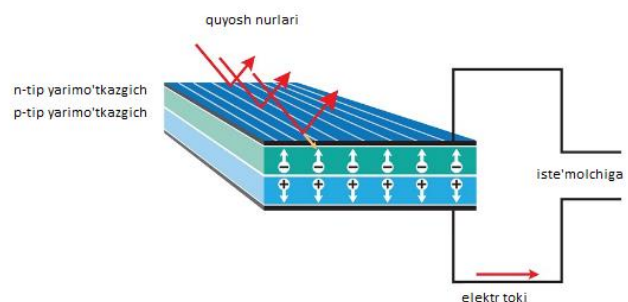
Foto-issiqlik-termoelektrik generator asosan uchta qismdan fotoelement, termoelektrik generator va quyosh havo isitgich kollektorining birlashtirilganidan iborat[1]. Foto-issiqlik-termoelektrik generator bir vaqtning o'zida quyosh energiyasini ham elektr energiyasi ham issiqlik energiyasiga aylantiradi. Ma'lumki fotoelement va termoelektrik generator elektr energiyasi ishlab chiqaradi. Quyosh havo isitgich kollektori esa quyosh energiyasini issiqlik energiyasiga aylantiradi.

Quyida foto-issiqlik-termoelektrik generatorni tashkil etuvchi qurilmalarni batafsil ko'rib chiqamiz.

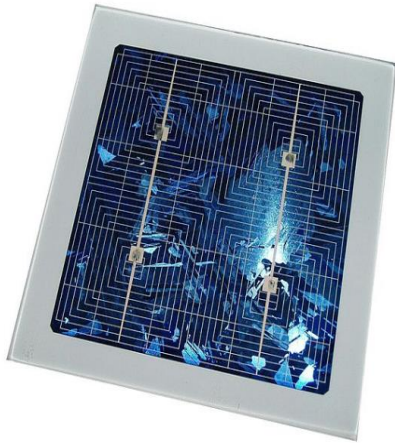
Quyosh batareyasi, quyosh paneli - fotoelektrik o'zgartirgich (fotoelement) larning birlashtirilgan to'plami - quyosh energiyasini to'g'ridan-to'g'ri elektr tokiga aylantiradigan yarim o'tkazgichli qurilma (1-rasm)[2]. Fotoelementning ish tamoyili 2-rasmda keltirilgan [3]. Fotoelement va quyosh panelining umumiy ko'rinishi 3 va 4-rasmda ko'rsatilgan [4,5].



1-rasm. Fotoelement, quyosh batareyasi va quyosh paneli.



2-rasm. Fotoelementning ish tamoyili



3-rasm. Fotoelement.



4-rasm. Qoyosh paneli

Termoelektrik generator (Pelte elementi) ning umumiy ko'rinishi 5-rasmda ko'rsatilgan[6]. Ish tamoyili esa 6-rasmda keltirilgan [7].

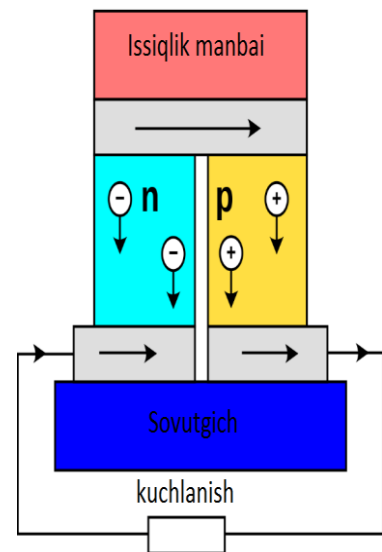


a)

5-rasm. Pelte modullariining umumiy ko'rinishi



b)

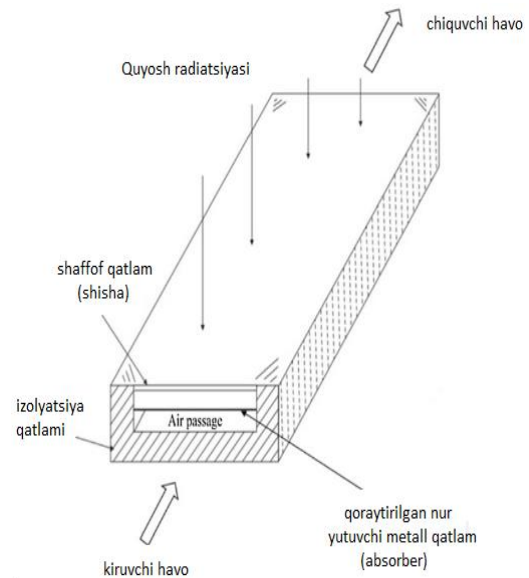


6-rasm. Termoelektrik generatori (Pelte elementlari asosida) har xil Zeebek koeffitsientiga ega bo'lgan materiallardan iborat (p- va n-yarim o'tkazgichlar). Yuk (kuchlanish) olib tashlanganda, oqim to'xtaydi va sxema termojuft vazifasini bajaradi.

Quyosh kollektorining umumiy ko'rinishi 7-rasmda ko'rsatilgan [8], ish tamoyili esa 8-rasmda ko'rsatilgan[9].



7-rasm. Quyosh havo isitgich kollektorining umumiy ko'rinishi



8-rasm. Quyosh havo isitgich kollektorining ish tamoyili sxemasi

Foto-issiqlik-termoelektrik generatorning matematik modeli ni ishlab chiqish va hisoblashlar o'tkazish uchun [13] da keltirilgan ma'lumotlardan foydalanildi.

**Ekologik tahlil.** Quyosh qurilmalaridan foydalanganda atrof-muhitga chiqariladigan zaharli gazlarning miqdori kamayadi. Zaharli gazlardan biri bu  $CO_2$  ya'ni karbonat angidrit gazi hisoblanadi. Zaharli gazlarning atrof-muhitga chiqishining kamayishi quyidagi ifoda orqali aniqlanadi [14]

$$M_{CO_2} = \frac{Q_f}{\chi \cdot \eta} K_{CO_2} \frac{44}{12} \quad (22)$$

bunda  $\Delta M_{CO_2}$  - quyosh qurilmalaridan foydalanganda atrof-muhitga chiqariladigan zaharli gazlar miqdorining kamayish massasi, kg;  $Q_f$  - quyosh qurilmasidan foydalanish natijasida olingan foydali energiya, J;  $\chi$  - an'anaviy yoqilg'ining solishtirma yonish issiqligi, J/kg;  $\eta$  - issiqlik manbaining foydali ish koeffitsiyenti;  $K_{CO_2}$  - turli energiya manbalari uchun uglerod emissiyasi koeffitsiyenti.

**FOYDALANILGAN ADABIYOTLAR**

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