

Off-grid solar container three-phase protocol for agricultural irrigation





Overview

An algorithm to optimise the number of solar panels and battery size to meet the water demands of an installation has been developed. The algorithm adjusts for seasonal changes in energy use and production.

What is a solar-powered pumping irrigation system?

A solar-powered pumping irrigation system utilizes solar photovoltaic (PV) technology to convert solar energy into electrical power, which drives pumps for water lifting and irrigation. This system does not rely on fossil fuels and avoids environmental pollution.

What is off-grid solar photovoltaic irrigation?

The aim is to make this technology equitable and environmentally sustainable. Worldwide, off-grid solar photovoltaic irrigation is currently being developed with the expectation that it will help secure water access to increase food production, reduce fuel-based carbon emissions and energy costs, and increase human resilience to climate change.

Can a solar-powered irrigation system be used to renovate a traditional irrigation system?

This paper presents a methodology for designing a solar-powered irrigation system and demonstrates its practical application in the renovation of a traditional irrigation system at a demonstration farmland. The system design begins by calculating the required water flow rate for the pump based on the farm's crop irrigation needs.

What are the components of a solar-powered irrigation system?

A typical solar-powered pumping irrigation system comprises several components, including PV modules, controllers, inverters, electric motors, water pumps, storage tanks, pipelines, etc. The system's working principle is depicted in Fig. 1.



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