Trough type solar automatic tracking system

What is automatic solar tracking?

The main aim of any automatic STS is to maximize the amount of sunlightthat the solar concentrator or module will receive,resulting in the maximization of the overall energy outputs of the system. Solar tracking can be performed in two ways: single-axis tracking and double-axis tracking.

What is an automatic Solar Tracking System (STS)?

An automatic solar tracking system (STS) is an emerging technology that rotates a solar panel or solar concentrator to various positions throughout the day by monitoring the current position and path of the sun.

Are automatic solar trackers effective?

Currently, research into automatic solar trackers is on the rise, as solar energy is abundant in nature, but its use in a highly efficient way is still lacking. This paper provides a detailed literature review and highlights some key advancements and challenges associated with state-of-the-art automatic solar tracking systems.

Can astronomical tracking methods be used in high solar availability?

The study supports the application of astronomical tracking methods in environments with high solar availability, such as Malaysia, where the average irradiance exceeds 600 W/m 2, and reinforces the advantage of pre-programmed sun path-based tracking for reliable and low-energy-consumption systems. 2.3. On the Basis of Control Systems

The system demonstrated high tracking accuracy, adaptability to variable environmental conditions, and cost-effectiveness. This research presents a novel paradigm for parabolic trough ...

Solar tracking systems are classified as single-axis or dual-axis, depending on the type of solar collector technology used. Both electrical and thermal solar energy systems use tracking systems.

This study explores thermal performance enhancement in a parabolic trough solar collector (PTSC) equipped with an auto-tracking system using zinc oxide (ZnO) nanofluids. The main ...

This review provides a comprehensive and multidisciplinary overview of recent advancements in solar tracking systems (STSs) aimed at improving the efficiency and adaptability of ...

The proposed automatic solar tracking system offers a cost-effective and sustainable approach to optimizing solar energy utilization, with potential applications in residential, commercial, ...

With the effect of STS, solar radiation on the system increased by an average of 18.8 %, and drying efficiency improved by 47.2 %. The study"s originality is using air-fluid in the tube system, ...

Abstract A sun tracking system incorporated into a parabolic trough collector for precise control is presented in this study. The collector"s rotation axis is aligned with the east-west direction. ...

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Field experience shows that tracking algorithm act stable and reliable and suit for PTCs. A sun-tracking system for parabolic trough solar concentrators (PTCs) is a control system used to orient the ...

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