SolarTech Power Solutions

# Trough solar intelligent tracking system

## Overview

What is a parabolic trough solar collector?

One of the most mature and internationally known technologies is the parabolic trough solar collector (PTSC), which has several applications, such as electricity generation, desalination, steam generation, and refrigeration systems, among others.

Does a parabolic trough concentrating collector receive direct solar radiation?

Therefore, for the purpose of optimizing the tracking mode of the parabolic trough concentrating collectors, the current work applied Hottel’s clear-day radiation model with an aim to study the amount of direct solar radiation received by the parabolic mirror within a year under different tracking modes in Shanghai.

What are the tracking modes of parabolic trough concentrating collectors?

Depending on the number of tracking axes, the tracking modes of parabolic trough concentrating collectors can be classified as dual-axis and single-axis solar tracking modes.

How does Mao compare trough collectors?

Mao studied the single-axis parabolic trough collectors [11, 12] and found the thermal output of the north-south tracking mode to be significantly higher than the east-west tracking mode in summer and the other way around in winter.

How does a parabolic trough concentrating collector work?

Parabolic trough concentrating collectors can only collect direct sunlight. When concentrating light, it needs an appropriate tracking mode to realize the maximum working efficiency.

What is a solar tracking system?

The solar tracking system is one of the active types with two axes containing photoresistive sensors, which are used to determine the solar position and electric actuators to correct the positioning of the gutter.

## Trough solar intelligent tracking system

### Design and implementation of a novel automated sun tracking system ...

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

### Pyramidal Sun Sensor: A Novel Sun Tracking System Solution ...

Jan 17, 2025 · A sun tracking system incorporated into a parabolic trough collector for precise control is presented in this study. The collector's rotation axis is

### Design and performance analysis of a solar tracking system ...

Apr 15, 2020 · Existing structural designs of various single-axis tracking systems have potentially limited energy


production. This paper presents the design and performance analysis of a ...

## (PDF) A Review and Comparative Analysis of Solar Tracking Systems

May 14, 2025 · This review provides a comprehensive and multidisciplinary overview of recent advancements in solar tracking systems (STSs) aimed at improving the efficiency and ...


## Microsoft Word

Jul 14, 2010 · Tracking is particularly important in solar energy collection systems that operate under concentrated sunlight. The aim of the research project is to test the solar-to-thermal ...

## Design and implementation of parabolic trough solar ...

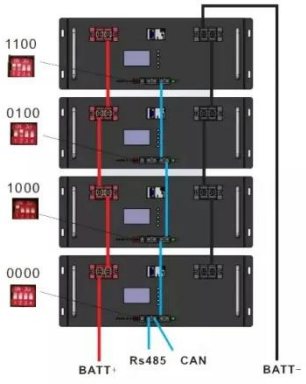
Jun 1, 2025 · Using SOLIDWORKS for 2D and 3D design and MATLAB for modelling the distribution and angles of solar radiation. The system has designed to track solar radiation ...

## Optimal design of the solar tracking system of parabolic trough

Sep 3, 2020 · Abstract The present work aimed to select the optimum solar tracking mode for parabolic trough concentrating collectors using numerical simulation. The current work ...

## AutCont2470118Rizvi

Jan 17, 2025 · 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 ...




## Designing and Performance Analysis of an active type ...

Mar 1, 2024 · ABSTRACT-An active type solar trekking system is developed for a novel modular sized parabolic trough. The system contains a pair of photo resistors that are connected into a ...

## A new two-axis solar tracker based on the online ...

Oct 1, 2023 · As an illustration, the photovoltaic system that works by solar tracker can receive 20% to 50% more solar energy [6] rather than systems set at a fixed angle. Therefore, solar ...


## Design and implementation of a novel automated sun tracking system ...

This study proposes a novel solar position tracking control system for parabolic trough collectors specifically designed for distributed heating applications, offering improved tracking accuracy, ...

## Optimal design of the solar tracking system of parabolic trough

Jan 6, 2024 · In this paper, a PLC-based sun-tracking system for parabolic trough solar concentrator which could track the sun along one axes was designed and implemented. In the ...

## Design for manufacture and assembly of an intelligent single axis solar

Jan 1, 2020 · Abstract Southern Africa and indeed Zimbabwe, which is in the center of this region, is endowed with a plethora of natural resources including abundant exposure to solar radiation ...

## Utilizing the multi-objective particle swarm

Oct 22, 2022 · The designed system consisted of a parabolic trough solar collector, organic Rankine cycle, lithium-bromide absorption refrigeration cycle, and proton exchange membrane ...

## Heat transfer analysis and

## numerical simulation of a ...

May 15, 2025 · This study comprehensively evaluates the performance and feasibility of a parabolic trough solar collector system under different physical conditions by performing ...

## Workbench for a Parabolic Trough Solar Collector with a Tracking System

Jul 5, 2022 · Novel low-cost parabolic trough solar collector with TPCT heat pipe and solar tracker: performance and comparing with commercial flat-plate and evacuated tube solar ...

## Microcontroller Based Single Axis Intelligent Control Sun Tracker ...

For this purpose microcontroller based real time sun tracker is designed which is controlled by an intelligent algorithm using shadow technique. The aim of the research project is to test the ...

## Trough type solar automatic light tracking

## system

What is automated solar tracking? In essence, this automated solar tracking system stands as a pioneering solution that unlocks the full potential of solar resources. Its ability to adapt and ...


## Development and application of novel sun-tracking control system ...

A distributed energy system with multi-source cooperative heating that relies primarily on trough solar thermal heating with high efficiency is designed due to low tracking accuracy in ...

## Efficient single and dual axis solar tracking system controllers based

Nov 1, 2020 · Artificial Intelligence is widely used in solar applications. Adaptive Neural Fuzzy Inference System (ANFIS) principle is one of the intelligent techniques that is sufficient to be ...

## Assessment of solar tracking systems: A

## comprehensive review

Aug 1, 2024 · An Intelligent Dual-Axis Solar Tracking System for Remote Weather Monitoring in the Agricultural Field Article Full-text available Aug 2023

## Solar tracking system - a review

Aug 23, 2023 · In this context solar tracking system is the best alternative to increase the eficiency of the photovoltaic panel. Solar trackers move the payload towards the sun throughout the ...

## Pyramidal Sun Sensor: A Novel Sun Tracking System Solution ...

Jan 17, 2025 · 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 ...

## Automatic Tracking for Parabolic Trough Solar Concentrator

Various solar tracking systems have been developed by various researches in the past decades. A tracking system is still required which can track the sun on real time basis without any ...

## Chronological development of innovations in reflector systems ...

Jul 1, 2021 · The parabolic trough collector (PTC) technology is the most mature and cost-effective of solar thermal technologies. Given its importance in the use of solar power for ...

## Trough type solar automatic light tracking system

Controlling the solar radiation concentrated collectors automatically tracking with the sun plays as the key factor to enhance the energy absorption. An automatic controlling device that can

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