

perSolar *TLC-1000*

The smart High-Performance Solar Collector System

Worldwide Innovation

Low Cost – Efficient – Durable
Simple – Sustainable – Stand-Alone

A Product of perSolar GmbH



The main advantages versus flat-plate collectors and tube collectors

Up to 40% higher energy yield via integrated solar tracking sensor

Due to an integrated smart sun tracking sensor, the perSolar solar trough *TLC-1000* collects up to 40% more solar energy.

High temperatures and efficiency with short warm-up

The concave shape of the reflector surface of the perSolar solar trough *TLC-1000* concentrates sun rays directly on the thin absorber tube with maximum heating efficiency. The heat-carrying medium can be used immediately and efficiently.

Maximized thermal isolation

Maximized thermal isolation due to a highly effective air insulating layer in the hermetically sealed shell unit. Even extremely cold outside temperatures result in negligible energy loss, comparable to a thermos bottle effect.

Problem solution for "misted front protection glass"

The smart solar trough offers an individual pressure-compensating system, preventing misting of the protection glass front due to condensed water inside the shell.

Automatic overheating protection

The smart solar trough contains a temperature control sensor, which automatically turns the solar thermal collector out of the sun as soon as the target temperature is reached – without impairments to the overall energy circuit system.

Easy assembly

The smart solar trough is easily assembled in a "do it yourself" manner without professional staff and can easily be mounted to an already fully functional pipe setup without impairing the closed system. Any plumber can install the pipe infrastructure required for the perSolar thermal collector system, completely composed of worldwide customary "off-the-shelf" parts.

Self-adjusting

Upon start-up, the integrated smart process controller autonomously and individually aligns each solar trough. The system is instantly operational and requires no further adjustments.

Wireless, power-independent system

The perSolar smart solar trough is completely self-sufficient. No external power supply is required. The process control system as well as the sun-tracking motor run solely on solar energy.

Programming and statistics optimization

Each solar trough is individually programmable (e.g. temperature limit). Process statistics of multiple parameters are automatically transmitted in order to allow a broad range of operational analysis. Thus the whole system can be efficiently adapted to individual local conditions.

Lightweight construction

The solar trough *TLC-1000* consists of a lightweight static construction. Therefore the strain on underlying pipe and roof infrastructures is minimal.

Low-cost

Simplicity is the basis of the innovative overall concept. As a result, the overall production and operational costs of the solar trough *TLC-1000* are substantially below market rates of conventionally available energy systems.

Long durability and maintenance-free

Optimally fine-tuned and verifiably wear-free components result in extreme durability of the solar trough *TLC-1000*. All movable component parts of the closed modular design are practically isolated in a dry cleanroom capsule. And therefore completely protected from environmental conditions. The maintenance-free construction of the solar trough results in considerable reductions in energy plant operating costs.

Minimal failure risk

The breakdown and/or replacement of a single solar trough will not result in downtime of the overall system, as this action does not require shutdown or physical opening of the piping system in operation – again resulting in considerably positive impact in the continuous operational costs.

Automatic dirt protection

At night the solar trough automatically turns in a downward protective position. This automatism considerably reduces the substantial nightly dirt contamination on the front protection glass. Main positive effects include sustainable optimization of the sun ray transparency of the front glass as well as drastic enormous minimization of cleaning intervals.

Storm-safe

The integrated vibration sensor of the solar trough *TLC-1000* reacts to strong vibrations and impacts, such as caused by strong wind conditions. In this case the solar trough automatically turns out of the danger zone in the position, which best reduces the wind pressure.

Technical Specifications

Gross area of the trough	~ 1 m ²
Pipe connection	28 mm ø
Aperture area	0.995 m ²
Dimensions	Length 2.05 m Width 0.5 m Depth 0.4 m
Weight	10 kg
Optical efficiency	~ 70%
CSP	11-fold (at ø 28 mm)
Power connection	not required
Temperature adjustable	40°C – 200°C (100°F - 400°F)
Materials	single-pane safety glass Polymer

Significant differences of the large solar trough for power plants include:

Achievable Temperature	450°C (850°F)
Ceramic bearings	
Aperture area	24 m²
Dimensions	4 m x 6 m

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