

# Solar Thermal Heating Training System

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01009



## Overview

This educational trainer has been designed to provide practical experience in harvesting solar energy from the sun for generating thermal energy through control panel to determine set points and to show variables like temperature, flow, etc.

The system is based on direct solar thermal energy system that uses the solar energy for heating water directly by an adjustable flat plate solar thermal collector, pump and manual valves for controlling the process and double jacket water storage tank.

## Hardware

- Flat plate solar collector consists of copper pipes used to absorb the radiant energy from sun light and transmit this energy to water for increasing its temperature. The absorption surface is coated with selective coating with high absorption coefficient, low radiation coefficient and can withstand temperature till 250 degrees.
- Solar thermal flat collector with selectively absorbing coating, surface: 2 m<sup>2</sup>
- Solar circulation station with pump, expansion vessel and safety valve
- Hot water circuit with buffer tank, pump and plate heat exchanger 3kW
- Tank: 70L
- Four bimetallic thermometers

- Solar controller with temperature, flow and illuminance sensors
- Data logger with USB interface
- Mobile Trolley with wheels

## Courseware

- Conversion of solar energy into heat
- Explore the functions of the flat collector and the solar circuit
- Calculating the net power and collector efficiency
- Influence of flow and net power
- Relationship between temperature difference (collector/environment) and collector efficiency