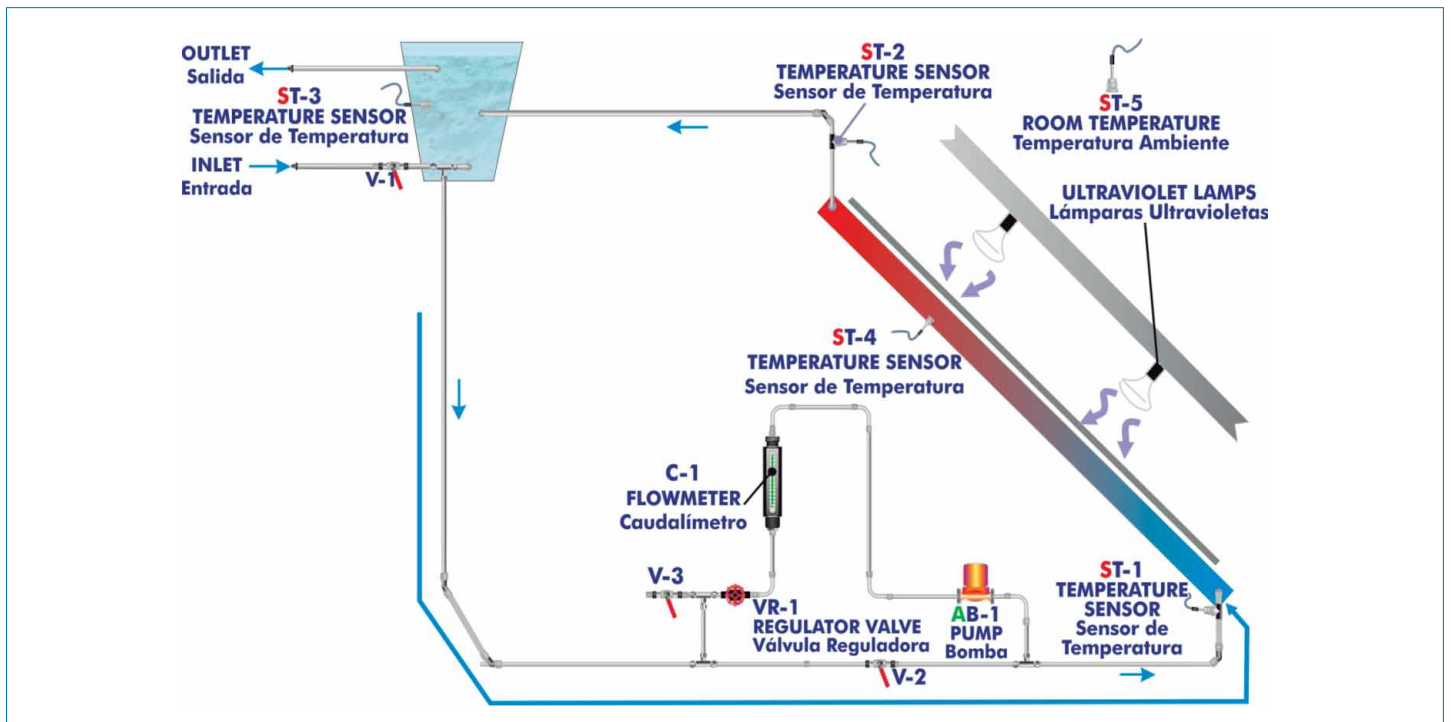




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PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9000: Quality Management
 (for Design, Manufacturing,
 Commercialization and After-sales service)



European Union Certificate
 (total safety)



Certificates ISO 14000 and
 ECO-Management and Audit Scheme
 (environmental management)



Certificado
 "Worlddidac Quality Charter"
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INTRODUCTION

The sun provides us a wide spectrum of solar energy. Except for the light that we see around us every day, all of the other types of solar energy are invisible. The other parts of the spectrum consist of cosmic rays, gamma rays, x-rays, infrared, heat and ultraviolet energy.

Thermal solar systems convert solar energy into usable thermal energy.

Thermal Solar Energy Basic Unit "MINI-EEST" allows to demonstrate solar thermal heating of domestic water in an illustrative manner.

GENERAL DESCRIPTION

This unit is a system that transforms solar energy into usable thermal energy.

This unit uses the thermosiphon system to heat water or the traditional pumping system. In both cases, the absorbed thermal energy is given by the simulated solar radiation; in our case, it is done using panel with powerful luminous sources.

The unit basically is formed by:

- Thermal solar panel.

- Tank.

- Solar simulator.

- Lamps.

- Pumping system.

- Temperature sensors.

- Flowmeter.

- Valves set to work in thermosiphon mode or pumping mode.

The solar panel is made of polycarbonate. It is mounted on a metallic structure with a conduct for the thermal fluid. It has been developed taking into account the geometrical shape of the absorbing surface in order to obtain the highest output levels possible.

The tank satisfies the established technical standards, both in its construction and in its equipment. The hot water outlet is through an overflow placed at the top of the tank.

The lamps present radiation features that are similar to those of the sun.

This unit makes it possible to simulate two different functioning modes: the thermosiphon mode, the water runs due to the temperature differences, that is to say, without pump; and the pumping mode.

5 Temperature sensors allow to know the temperature at different points of the unit.

A flowmeter allows to know the water flow that is running through the pump and, therefore, through the collector.

The unit has every pipe and connection for an optimal operation.

SPECIFICATIONS

Unit mounted on a metallic structure with wheels for its mobility.

Main metallic elements of steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Solar panel (thermal solar collector):

- Metallic structure.

- Solar panel, is made of polycarbonate, with polypropylene pipes.

- Pipes (already set) to connect the panel and the tank.

- Temperature sensors, "J" type.

Tank of 30 l.

Solar simulator:

- Aluminum structure with adjustable height.

- 2 Solar spectrum lamps of 300W each one.

Pumping system:

- Pump, range: 0-2 l./min.

- Flowmeter.

5 Temperature sensors, "J" type, at different points of the unit.

The unit includes two "Venetian" type blinds to reduce a direct visual contact with the lamps and to reduce the direct contact with the solar panel when the unit is working.

Electronic console:

- Metallic box.

- Connections for the temperature sensors.

- Digital display for the temperature sensors.

- Selector for the temperature sensors.

- Pump switch.

- Lamps switch.

Cables and Accessories, for normal operation.

Manuals:

- This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Study of the thermosiphon operation.
- 2.- Study of the luminosity profile of the lamps.
- 3.- Study of the efficiency of the solar panel.
- 4.- Study of the influence of the inclination angle of the lamp panel on the unit efficiency.
- 5.- Study of the relation between the flow and the temperature.
- 6.- Study of the energy balance of the solar collector.
- 7.- Experimental efficiency determination.

REQUIRED SERVICES

- Electrical supply: single-phase, 220V./50 Hz or 110V/60 Hz.
- Water supply.

DIMENSIONS & WEIGHTS

MINI-EESTC:	
Unit:	-Dimensions: 1300 x 800 x 1500mm. approx. (51.18 x 31.49 x 59.05 inches approx.)
	-Weight: 70 Kg. approx. (154 pounds approx.)
Electronic console:	-Dimensions: 490 x 330 x 310 mm. approx. (19.29 x 12.99 x 12.20 inches approx.)
	-Weight: 10 Kg. approx. (22 pounds approx.)

AVAILABLE VERSIONS

Offered in this catalogue:

-MINI-EEST. Thermal Solar Energy Basic Unit.

Offered in other catalogues:

-MINI-EESTC. Computer Controlled Thermal Solar Energy Basic Unit.

-EESTC. Computer Controlled Thermal Solar Energy Unit.

-EEST. Thermal Solar Energy Unit.

*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



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