Thermal Solar Energy Basic Unit

MINI-EEST

Technical Teaching Equipment

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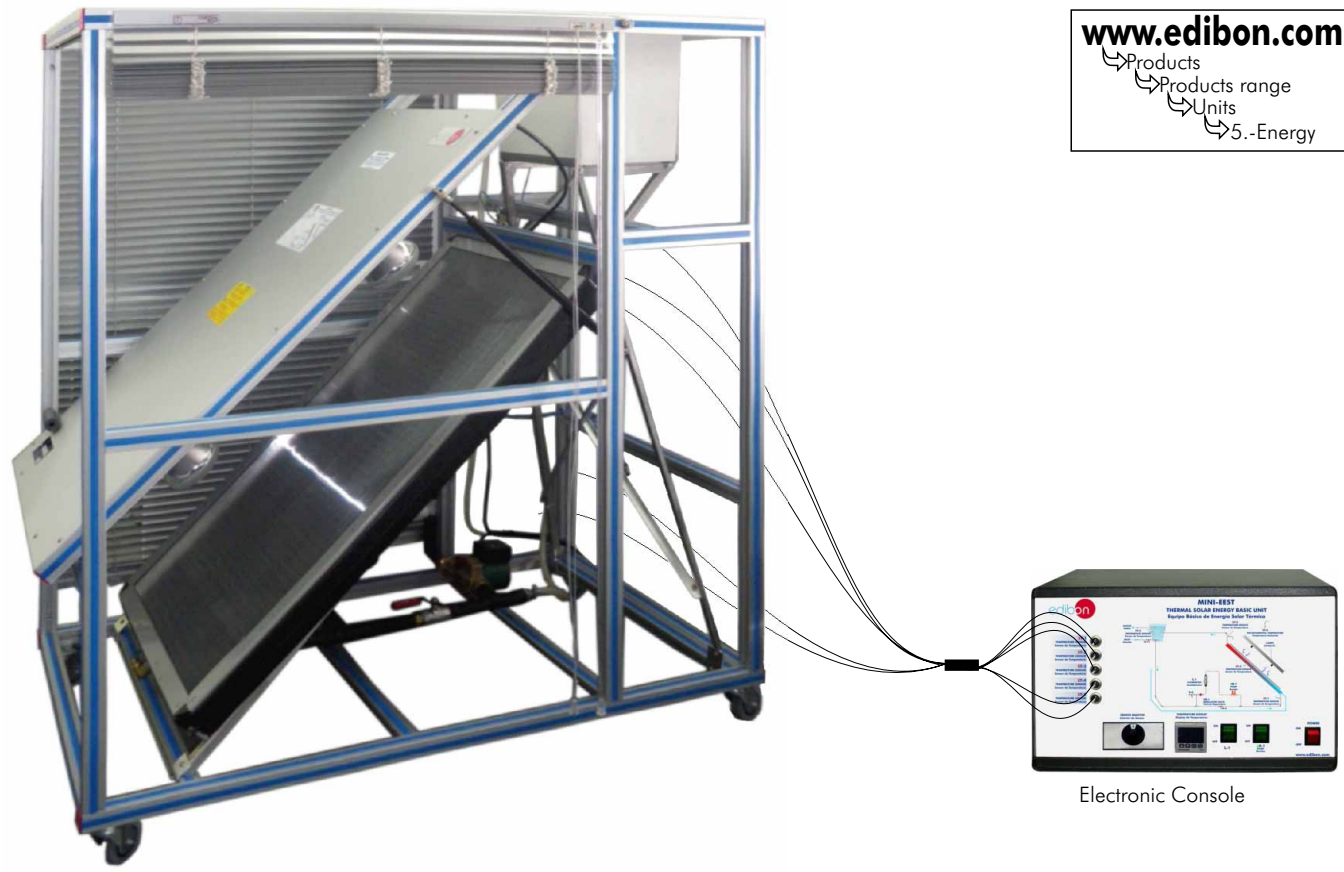
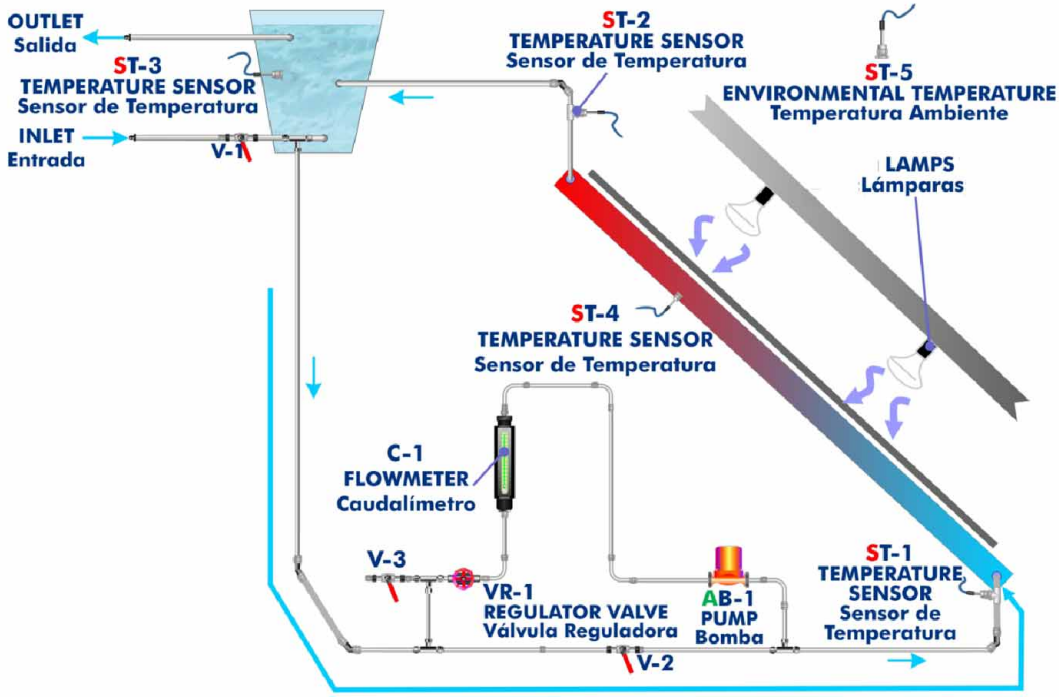


Electronic Console

PROCESS DIAGRAM AND ELEMENTS ALLOCATION



Note:
ST= Temperature sensor.
C= Flowmeter.
AB= Pump.
VR= Regulation Valve.
V= Valve.

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)

Worlddidac Quality Charter Certificate
(Worlddidac Member)

DESCRIPCIÓN

This unit is a system that transforms solar energy into calorific energy.

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

Basically the unit is formed by:

- Thermal solar panel.
- Tank.
- Solar simulator.
- Lamps.
- Pump.
- Temperature sensors.
- Flowmeter.
- Valves set to work in thermosiphon mode or pumping mode.

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

The tank satisfies the set standards both in its construction and its equipment. The hot water outlet is through an overflow placed at the top of the tank. Its capacity is 30 litres.

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

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

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

The flowmeter allows to know the water that is running through the pump and the colector.

The unit has every pipes and connections for its optimal function.

SPECIFICATIONS

Unit mounted on an anodized aluminium structure.
Main metallic elements in 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 prepared) to connect the panel and the accumulator.**
- **Temperature sensors, type "J ".**

Accumulator tank of 30 l.
Solar simulator:
- **Aluminium structure with adjustable height.**
- **2 Solar spectrum lamps of 300W each one.**
- **Feed wire.**

Pumping equipment:
- **Impulse pump, range: 0 - 2 l./min.**
- **Flowmeter, range: 0 - 2 l./min.**

5 Temperature sensors, type "J", in different points of the unit.
Protection curtains.
This unit has wheels for its mobility.
Electronic Console:
- **Metallic box.**
- **Connections for temperature sensors.**
- **Digital display for temperature sensors.**
- **Selector for 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, Maintenanc & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

Some Practical Possibilities of the Unit

1.-Study of how the thermosiphon works.

2.-Study of the lamp illumination profile.

3.-Study of the solar collector efficiency.

4.-Study of the influence of the inclination angle of the lamp panel on the unit efficiency.

5.-Relationship between the flow and the temperature.

6.-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-EEST:

Unit: -Dimensions: 1300 x 800 x 1500 mm. approx.
-Weight: 70 Kg. approx.

Electronic Console: -Dimensions: 490 x 330 x 310 mm. approx.
-Weight: 10 Kg. 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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Issue: ED01/11
Date: June/2011

REPRESENTATIVE: