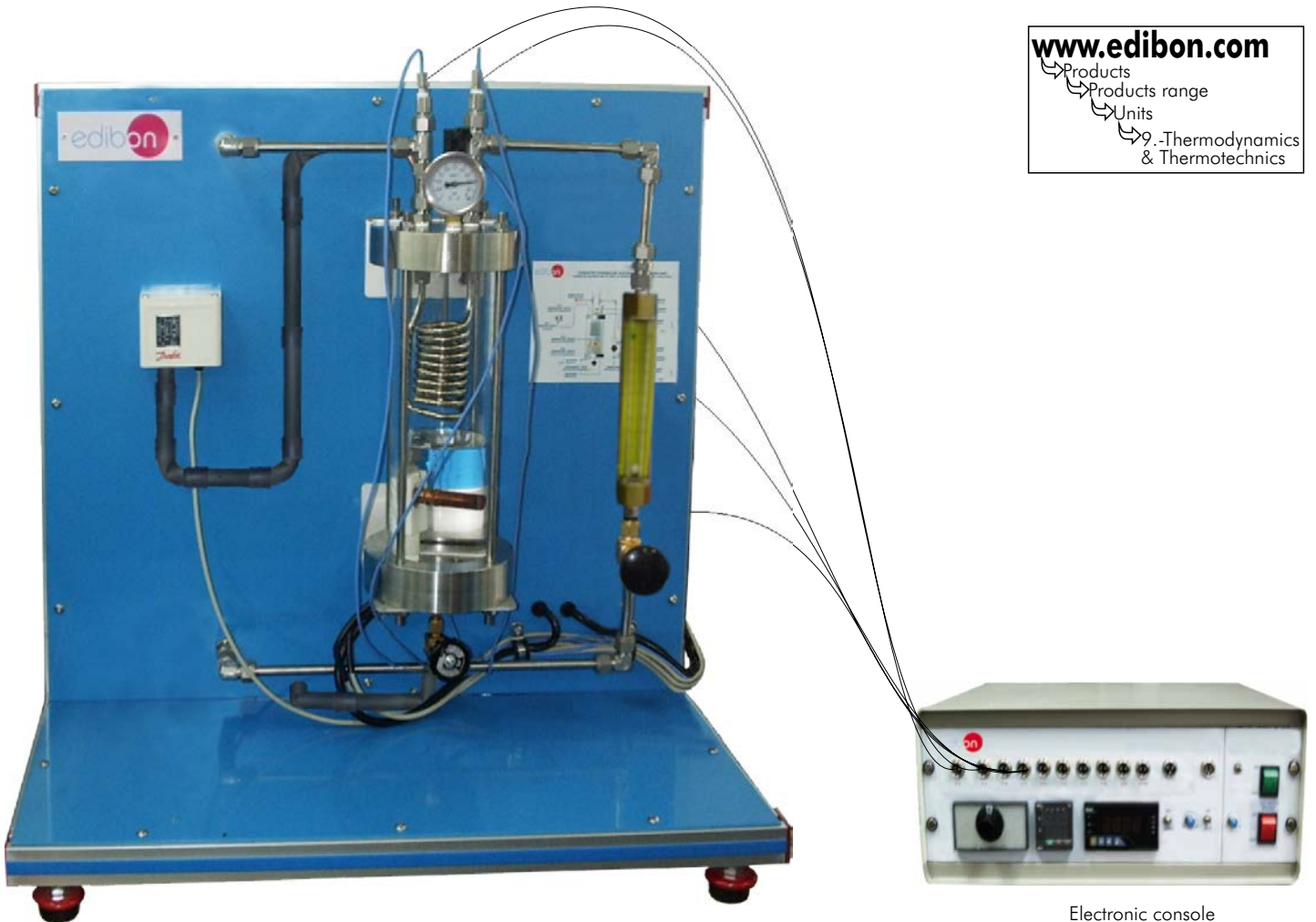


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 Products  
 Products range  
 Units  
 9.-Thermodynamics & Thermotechnics



Electronic console

## DESCRIPTION

Boiling is the one of most important processes in the transfer of heat and it is used in many industrial applications.

Students can investigate the modes of boiling and can make qualitative and quantitative studies and assessments of convective, nucleate and film boiling.

This unit allows the student to see the processes taking place inside a transparent cylinder and measure temperatures and heat flux under steady state conditions. Wide range of conditions can be investigated.

The unit is supplied with the suitable sensors and instrumentation for the most representative parameters measurements and controls (electronic console).



**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)

## SPECIFICATIONS

Bench-top unit, designed to employ the coolant SES-36.

Anodized aluminium structure and panels in painted steel.

Main metallic elements in stainless steel.

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

Chamber: cylinder of boron silicate of high resistance; internal diameter: 90 mm., external diameter: 100mm. and length: 300 mm.

Heating resistance of 690 W, stuffed in a copper cylinder of internal diameter: 12.7 mm., external diameter: 16mm. and length 50 mm.

Serpentine condenser: a copper tube plated with a surface of 0.043 m<sup>2</sup>.

Load valve placed in the bottom part of the cylinder and it is used for charging and discharging of the unit.

Water flow control valve located in the conduction line of water. It regulates the water flow that inputs the serpentine.

Purge and safety valve.

5 Temperature sensors ("J" type):

Temperature sensor to measure the temperature of the hot surface.

Temperature sensor to measure the temperature of the coolant.

Temperature sensor at the water inlet.

Temperature sensor at the water outlet.

Temperature sensor to determine the temperature of the saturated vapour.

Pressure meter.

Wattmeter.

Flow meter.

Temperature circuit breaker.

High-pressure cut-out.

Electronic console:

Metallic box.

Heating resistance controller.

Temperature sensors connections.

Digital display for the temperature sensors.

Selector for the temperature sensors.

Wattmeter display.

High pressure control connection.

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

### Some Practical Possibilities of the Unit:

- 1.-Visual demonstration of the three boiling modalities (convective, nucleate and film boiling).
- 2.-Determination of the thermal flow and the superficial heat transfer coefficient.
- 3.-Effect of the pressure on the critical thermal flow.
- 4.-Film condensation.
- 5.-Demonstration of the liquid dragging for the vapour.
- 6.-Relationship between the pressure and the temperature.

7.-Air effect in an installation.

Additional practical possibilities:

8.-Gauge pressure/Enthalpy.

9.-Properties of the SES-36.

## REQUIRED SERVICES

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

## DIMENSIONS & WEIGHTS

TCEB:

- Unit: -Dimensions: 700 x 700 x 720 mm. approx.  
-Weight: 70 Kg. approx.
- Electronic console: -Dimensions: 490 x 330 x 310 mm. approx.  
-Weight: 15 Kg. approx.

## AVAILABLE VERSIONS

Offered in this catalogue:

- TCEB . **Boiling Heat Transfer Unit.**

Offered in other catalogue:

- TCEC. **Computer Controlled Boiling Heat Transfer Unit..**

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



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