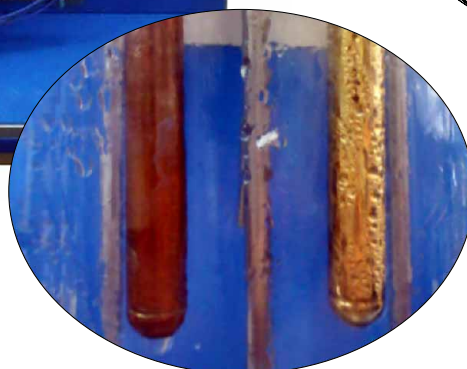




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Products  
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Units  
9.-Thermodynamics  
& Thermotechnics



Electronic console

### DESCRIPTION

The TCPGB unit has been specially designed for students use and to provide visual results and quantitative results related to heat transfer during condensation.

Self-contained unit, which has its own steam generator and air extraction system, as well as condensers to provide dropwise and filmwise condensation.



**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, which has its own steam generator and air extraction system, as well as condensers to provide dropwise and filmwise condensation.

Anodized aluminium structure and panels in painted steel (epoxy paint).

Main metallic elements in stainless steel.

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

Steam chamber: thick-walled glass cylinder with aluminium ends and P.T.F.E. seals. Capacity: approximately 0.5 - 1 Kg. of distilled water.

2 Water cooled condensers, mounted in the upper cylinder cover. Dimensions: 12.7 mm. external diameter and 90 mm. effective length. They are specially designed and manufactured of cooper, incorporating a heat exchanger in order to reduce the surface temperature variation to a minimum:

Dropwise condenser-gold plated.

Filmwise condenser-natural finish.

Each condenser is provided with three connected temperature sensors ("K" type) to measure the mean metal temperature, and two temperature sensors ("J" type) to measure the inlet and outlet water temperatures, respectively.

Electric heating element (3 KW. resistance) with thermal protection.

Air extraction system, composed by air cooler, separator and water jet vacuum pump with the necessary valves.

Pressure meter, to measure the chamber pressure.

Flow meters, to measure the water flow rate through the condensers.

Safety:

Pressure relief valve fitted to upper cylinder cover.

Pressure switch (fix to 2 bar).

Heater thermal protection (120°C thermostat).

All electrical elements/components are earthed and fused.

Electronic Console:

Metallic box.

Temperature sensors connections.

Selector for temperature sensors.

Digital display for temperature sensors.

Switch and regulator for the electric heating element (resistance).

Wattmeter display.

On/Off main switch.

Cables and Accessories, for normal operation.

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

## EXERCISES AND PRACTICAL POSSIBILITIES

### Some Practical Possibilities of the Unit:

- 1.- Investigation of the saturation pressure/temperature relationship for H<sub>2</sub>O between about 20° C and 100° C.
- 2.- Visual demonstration of filmwise and dropwise condensation, and of nucleate boiling.
- 3.- Measurement of heat flow and surface heat transfer coefficient in both filmwise and dropwise condensation at pressures up to atmospheric.
- 4.- Demonstration and investigation of the effect of air in condensers.
- 5.- Demonstration of Dalton's Law.

## REQUIRED SERVICES

- Electrical supply: 3 KW, single-phase, 220V./50Hz or 110V./60Hz.
- Water supply.

## DIMENSIONS & WEIGHTS

### TCPGB:

- Unit: -Dimensions: 700 x 570 x 770 mm. approx.  
-Weight: 60 Kg. approx.
- Electronic Console: -Dimensions: 490 x 330 x 310 mm. approx.  
-Weight: 10 Kg. approx.

## AVAILABLE VERSIONS

### Offered in this catalogue:

-TCPGB. **Film and Dropwise Condensation Unit.**

### Offered in other catalogue:

-TCPGC. **Computer Controlled Film and Dropwise Condensation Unit.**

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



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