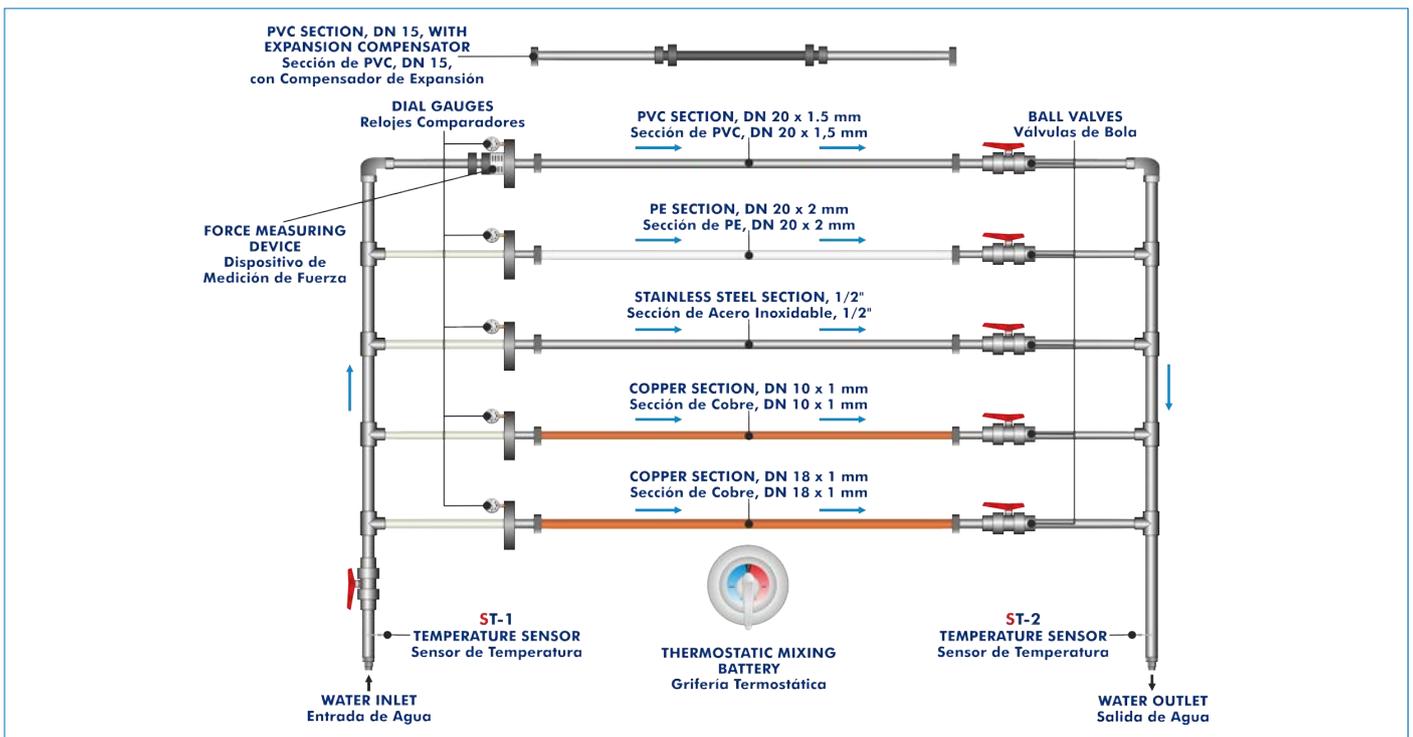




Electronic console

## PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



Certificate and Worlddidac Member

## INTRODUCTION

Most solid materials expand upon heating and contract when cooled. Materials generally change their size when subjected to a temperature change while the pressure is constant. In the case of solid materials, the pressure does not appreciably affect the size of a solid. Thermal expansion is a material property that indicative the tendency of the material to change in volume in response to a change in temperature. Different materials expand by different amounts.

## GENERAL DESCRIPTION

The Thermal Expansion Training Unit, "TEDT", allows to study the thermal expansion of different pipe sections and the thermal expansion force.

It comprises original components as used in heating and sanitation systems.

This unit provides measurements for the determination of the thermal expansion of several pipe sections. The unit includes six pipe sections and one of these sections is fitted with an expansion compensator to compensate thermal stress in the pipe. These sections are made of different materials and diameters. Several dial gauges situated on the pipe sections inlet measure the elongation of the pipes and a force measuring device allows to determine the thermal expansion force. The pipe sections can be individually selected using the ball valves situated at the pipe section outlet. The cold and hot water connections made using quick-release couplings. The water inlet temperature can be adjusted by these connections and a mixing faucet. The inlet and outlet lines include two temperature sensors to measure the change of temperature.

## SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

The unit includes wheels to facilitate its mobility.

Main metallic elements made of stainless steel.

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

Six pipe sections:

- Length: 1000 mm, each one.

- Stainless steel pipe section with an external diameter of 1/2".

- Copper pipe section with an external diameter of 10 mm.

- Copper pipe section with an external diameter of 18 mm.

- PVC pipe section with an external diameter of 20 mm.

- PVC pipe section with an external diameter of 15 mm with an expansion compensator to compensate thermal stress in this section.

- PE pipe section with an external diameter of 20 mm.

Six ball valves:

- Five ball valves to select the pipe sections.

- A ball valve situated in the water inlet line.

A thermostatic mixing faucet to adjust the water inlet temperature.

Five dial gauges to measure the elongation of the pipe sections.

A force measuring device to determine the thermal expansion force.

Two "J" type temperature sensors situated in the water inlet and outlet lines.

Water connections made using quick-release couplings.

Electronic console:

- Metallic box.

- Temperature sensors connections.

- Selector for temperature sensors.

- Digital display for temperature sensors.

- ON/OFF main switch.

Cables and Accessories, for normal operation.

Manuals: This unit is supplied with the following manuals: Required services, Assembly and Installation, Starting-up, Security, Maintenance and Practices manual.

## EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Measurement of the pipe sections elongation.
- 2.- Determination of the thermal expansion of different materials such as stainless steel, copper, PVC and PE.
- 3.- Study of the effect of varying pipe diameter in the thermal expansion.
- 4.- Determination of the thermal expansion coefficients.
- 5.- Determination of the thermal expansion force.
- 6.- Study of the expansion compensator.

## REQUIRED SERVICES

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

## DIMENSIONS AND WEIGHTS

TEDT:

Unit:

-Dimensions: 1700 x 700 x 1800 mm approx.

(66.93 x 27.56 x 70.86 inches approx.)

-Weight: 100 Kg approx.

(220 pounds approx.)

Electronic console:

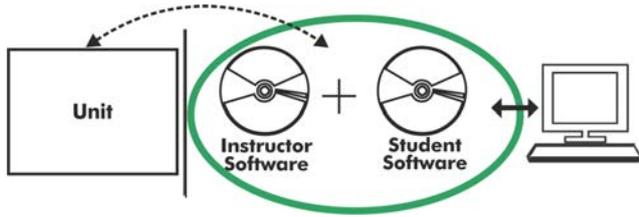
-Dimensions: 300 x 190 x 130 mm approx.

(11.81 x 7.48 x 5.11 inches approx.)

-Weight : 3 Kg approx.

(6.6 pounds approx.)

**TEDT/ICAI. Interactive Computer Aided Instruction Software System:**



With no physical connection between unit and computer (PC), this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

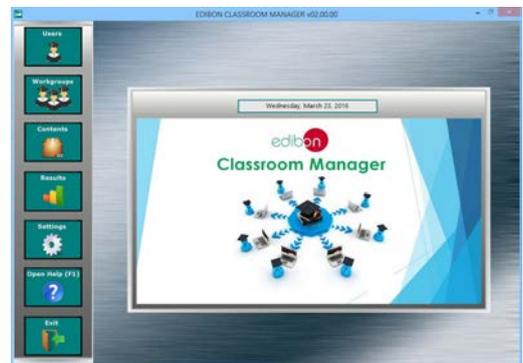
Instructor Software

**- ECM-SOF. EDIBON Classroom Manager (Instructor Software).**

ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

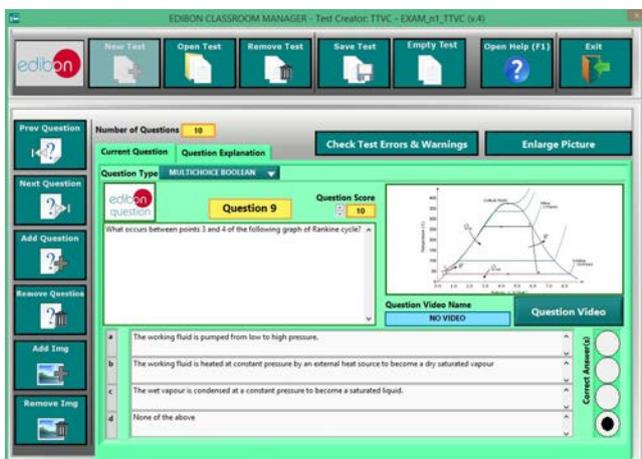
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



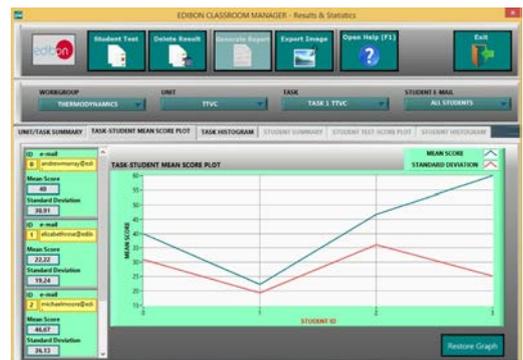
ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional  
Student Software

- ESL-SOF. EDIBON Student Labsoft (Student Software).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- Test self-correction.
- Calculations computing and plotting.
- Equation System Solver Engine.
- User Monitoring Learning & Printable Reports.
- Multimedia-Supported auxiliary resources.

For more information see ICAI catalogue. Click on the following link:

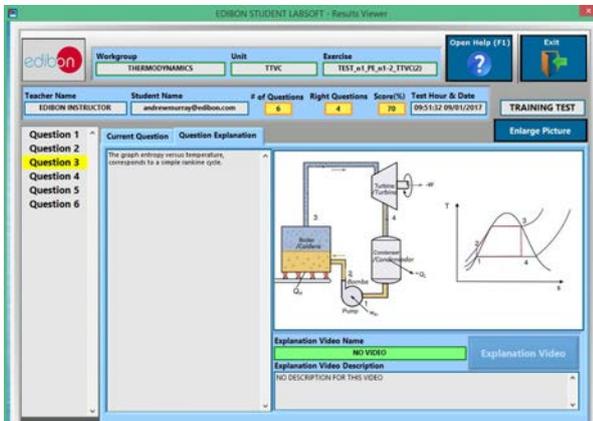
[www.edibon.com/en/files/expansion/ICAI/catalog](http://www.edibon.com/en/files/expansion/ICAI/catalog)



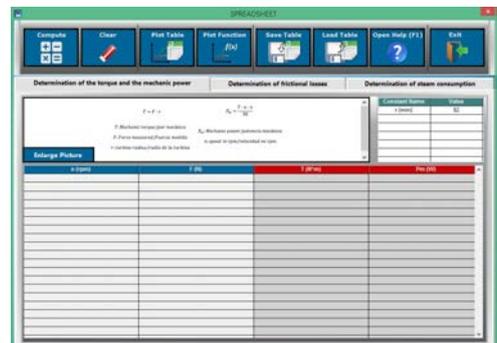
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

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



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REPRESENTATIVE:

