edibon

Engineering and Technical
Teaching Equipment

TCPT

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION
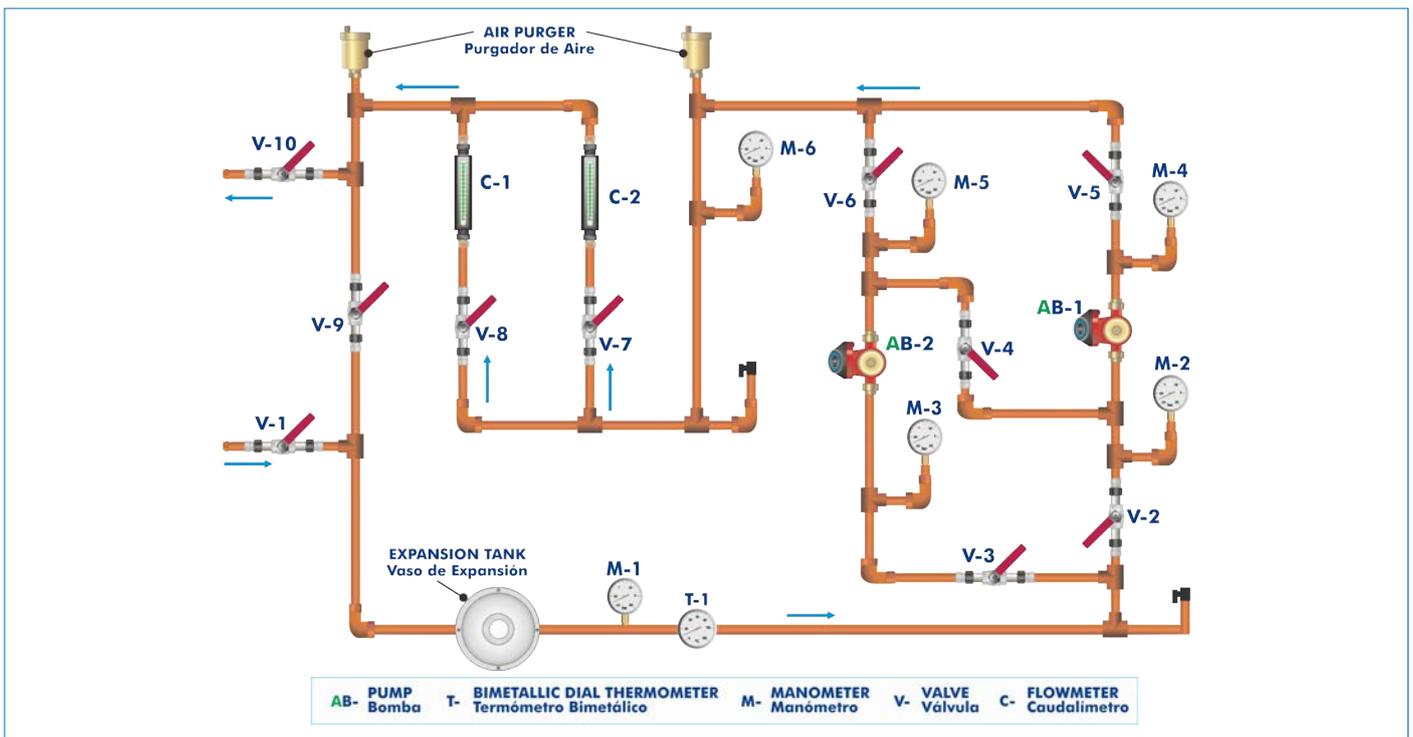
AIR PURGER
Purgador de Aire

V-10

C-1   C-2

M-6

V-6   M-5   V-5   M-4

V-9   V-8   V-7

AB-1

AB-2   V-4   M-2

V-1   M-3

V-2

EXPANSION TANK
Vaso de Expansión

M-1   V-3

T-1

AB-	**PUMP** Bomba	T-	**BIMETALLIC DIAL THERMOMETER** Termómetro Bimetálico	M-	**MANOMETER** Manómetro	V-	**VALVE** Válvula	C-	**FLOWMETER** Caudalímetro

INTRODUCTION

A pump is a device capable of transferring energy to a fluid that drives it, which means transforming the mechanical energy of an impeller into kinetic energy or pressure of a fluid.

In all heating installations, a recirculation pump is necessary, which ensures the movement of water throughout the circuit. In some cases, depending on the installation conditions, more than one pump is required to help drive the fluid throughout the circuit.

When more than one pump is installed in a heating circuit, they can work both in series and in parallel, so that the performance of the fluid will be different in each case.

GENERAL DESCRIPTION

The Circulation Pumps Training Unit, "TCPT", is a unit of experimentation of sanitary and heating techniques that allows studying the operation of circulating pumps, both connected in series and in parallel.

It consists of a pipe circuit with two circulation pumps, which can work in series or in parallel depending on the arrangement of ball valves.

The unit represents a simple installation of heating that includes real elements, such as air bleeders, flowmeters of different measuring range, manometers in different representative point of the installation, bimetallic thermometer to know the working temperature and an expansion vessel that allows working in a closed circuit.

SPECIFICATIONS

Anodized aluminum frame and panels in 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.

Two circulating pumps:

    Power consumption: 77 W.

    Max. flow rate: 60 l/min.

    Max. head: 6 m.

Expansion vessel.

Five Bourdon manometers, range: 0 – 3 bar.

Ball valves that allows the circuit to work in series or in parallel.

Two bleed valves.

Two flowmeters:

    Range: 2.5 – 28 l/min.

    Range: 6.5 – 68 l/min.

Bimetallic thermometer, range: 0 – 100 °C.

Control panel:

    Pump connections.

    Pump switchs.

    Pump controllers.

    Main 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.- Variation of the circuit depending on the connection of the pumps in series or in parallel.

2.- Study of the characteristic curves of the service points and the pipe circuit.

3.- Representation of the characteristic curves of the pump as a function of number of revolution.
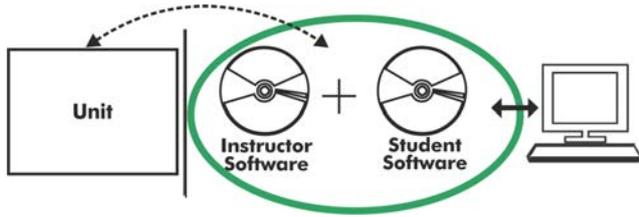
REQUIRED SERVICES

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

DIMENSIONS AND WEIGHTS

TCPT:
- Dimensions: 1700 x 650 x 1700 mm approx.
  (66.92 x 25.59 x 66.92 inches approx.)
- Weight: 80 Kg approx.
  (176 pounds approx.)

TCPT/ICAI. Interactive Computer Aided Instruction Software System:

With no physical connection between unit and computer, **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.
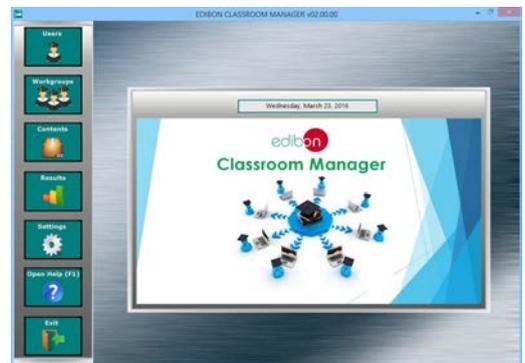
<u>Instructor Software</u>

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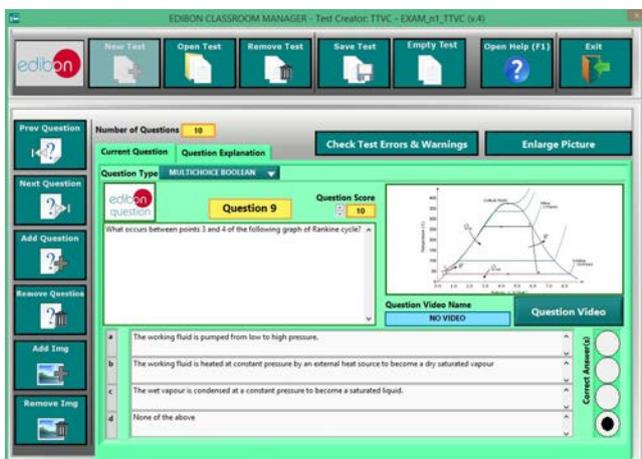
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

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

- 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:
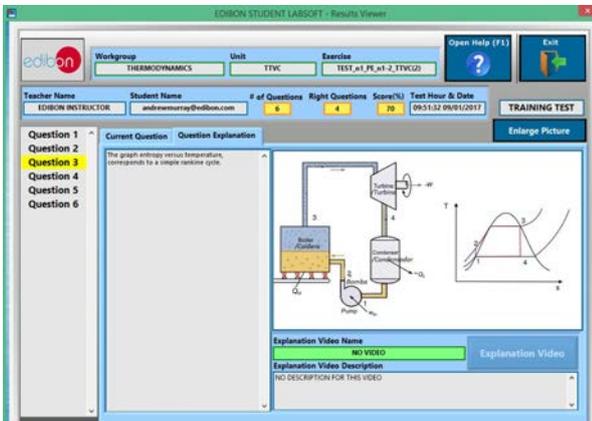
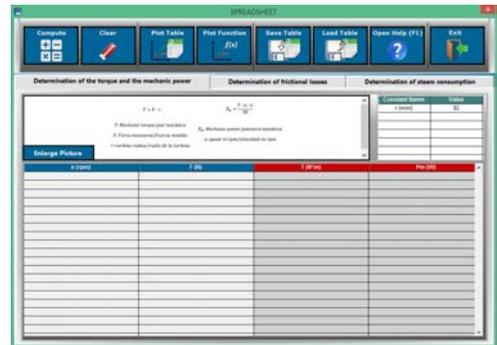www.edibon.com/en/files/expansion/ICAI/catalog

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.

REPRESENTATIVE: