Heating System Training Unit

THST

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⤷PRODUCTS
⤷90.- THERMODYNAMICS
& THERMOTECHNICS

edibon

Engineering and Technical
Teaching Equipment

C- FLOWMETER Caudalímetro   T- BIMETALLIC DIAL THERMOMETER Termómetro Bimetálico   VP- AUTOMATIC AIR VENT VALVE Válvula Purgador de Aire Automática   VR- REGULATION VALVE Válvula de Regulación   VRT- THERMOSTATIC REGULATION VALVE Válvula de Regulación Termostática

INTRODUCTION

Heating refers to the method or system used to supply heat to a person or a space with the aim of keeping or raising its temperature.

Applied to buildings, heating covers the group of devices and accessories installed to reach and keep thermal comfort conditions during cold seasons, so it is part of air-conditioning systems.

There are two types of heating systems, according to their extension: central heating and space heating. In the first case, heat is generated in one place and it is distributed through pipes to the rooms to be heated. In the second case, only one apparatus generates and emits heat in a room.

Current central heating systems are more efficient than individual systems. This is due to the fact that a more efficient system can be afforded, since output increases with the size of the system, divided consumption causes less stops and starts of the boiler and use is more intensive, so the investment is recovered soon.

GENERAL DESCRIPTION

The Heating System Training Unit, "THST", has been designed to study central heating systems.

The unit simulates a central heating system. For that purpose, it is made up of four radiators with a thermostatic valve each. This valve controls the temperature and closes the flow of water when a specific temperature is reached. This temperature is selected in the head of the valve. To guarantee the circulation of water towards the radiators, the unit includes a circulation pump. Rotameters are used to measure the flow. A digital control device is included to keep the temperature of the room constant. And a four-way mixing valve is used to adjust the temperature of the feed and return flow of the boiler.

Pressure is balanced by a differential pressure overflow valve.

There are two cold water connections to dissipate the generated heat. Bimetallic thermometers are used to measure the temperature in the pipes.

SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

The unit includes wheels to facilitate its mobility.

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

Heating system:

    Circulation pump:

        Maximum flow rate: 3600 l/h.

        Maximum head: 4 m.

    Four-ways mixing valve:

        Nominal diameter: 20 mm.

        Nominal pressure: 10 bar.

        Working temperature: -10 – 110 °C.

Heating controller with feedback of the feed flow temperature with input for two temperature sensors.

Five automatic air vents.

Overflow valve.

Four radiators:

    Heat exchanger with eight plates.

    Four thermostatic valves to control the temperature of the radiators.

Five bimetallic thermometers, range: 0 – 100 °C.

Seven rotameters:

    Four of them with a range from 0 – 400 l/h.

    Two of them with a range from 150 – 1600 l/h.

    One of them with a range from 0 – 1000 l/h.

Four water connections:

    Two DN 15 cold water connections with quick-release fittings.

    Two DN 15 boiler water connections with quick-release fittings.

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

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Familiarization with the most common components of a heating installation.

2.- Study of the operation of a central heating system and its components.

3.- Study of a circulation pump.

4.- Study of the operation of a thermostatic valve.

5.- Understanding a four-ways mixing valve to adjust the temperature of the feed and return water of the boiler.

6.- Study of the operation of a heating controller.

REQUIRED SERVICES

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

- Hot and cold water supply.

- Drain.

DIMENSIONS AND WEIGHTS

THST:

    -Dimensions: 1700 x 700 x 1700 mm approx.

        (66.92 x 27.55 x 66.92 inches approx.)

    -Weight: 90 Kg approx.

        (198.41 pounds approx.)

THST/ICAI. Interactive Computer Aided Instruction Software System:
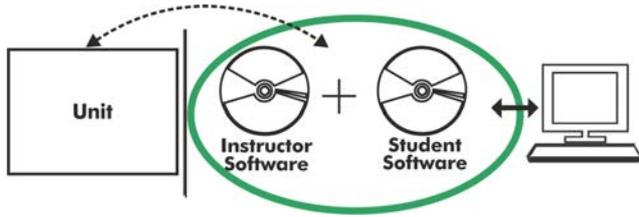
With no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment 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
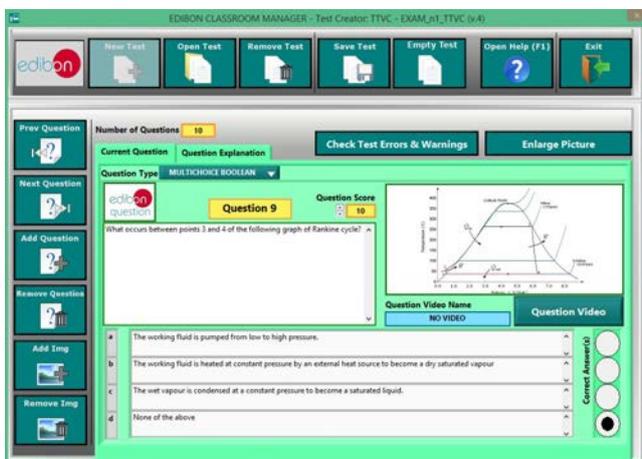
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

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
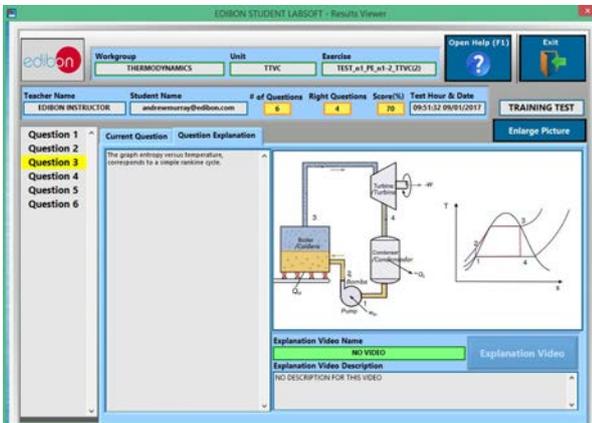
ERS. EDIBON Results & Statistics Program Package - Question Explanation
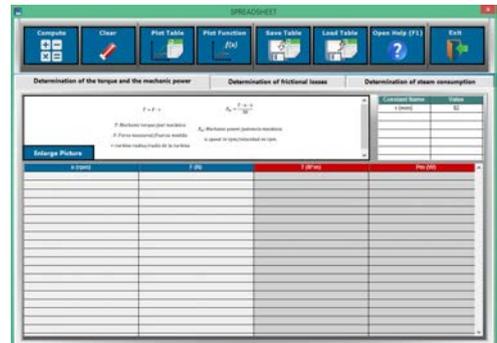
ECAL. EDIBON Calculations Program Package Main Screen

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

REPRESENTATIVE:

C/ Julio Cervera, 10-12-14. Móstoles Tecnológico.
28935 MÓSTOLES. (Madrid). ESPAÑA - SPAIN.
Tel.: 34-91-6199363   Fax: 34-91-6198647
E-mail: edibon@edibon.com   Web: **www.edibon.com**

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