



Engineering and Technical
Teaching Equipment

Heat Pump, Refrigeration and Air Conditioning Unit (two condensers (water and air) and two evaporators (water and air))

THAR22B

www.edibon.com

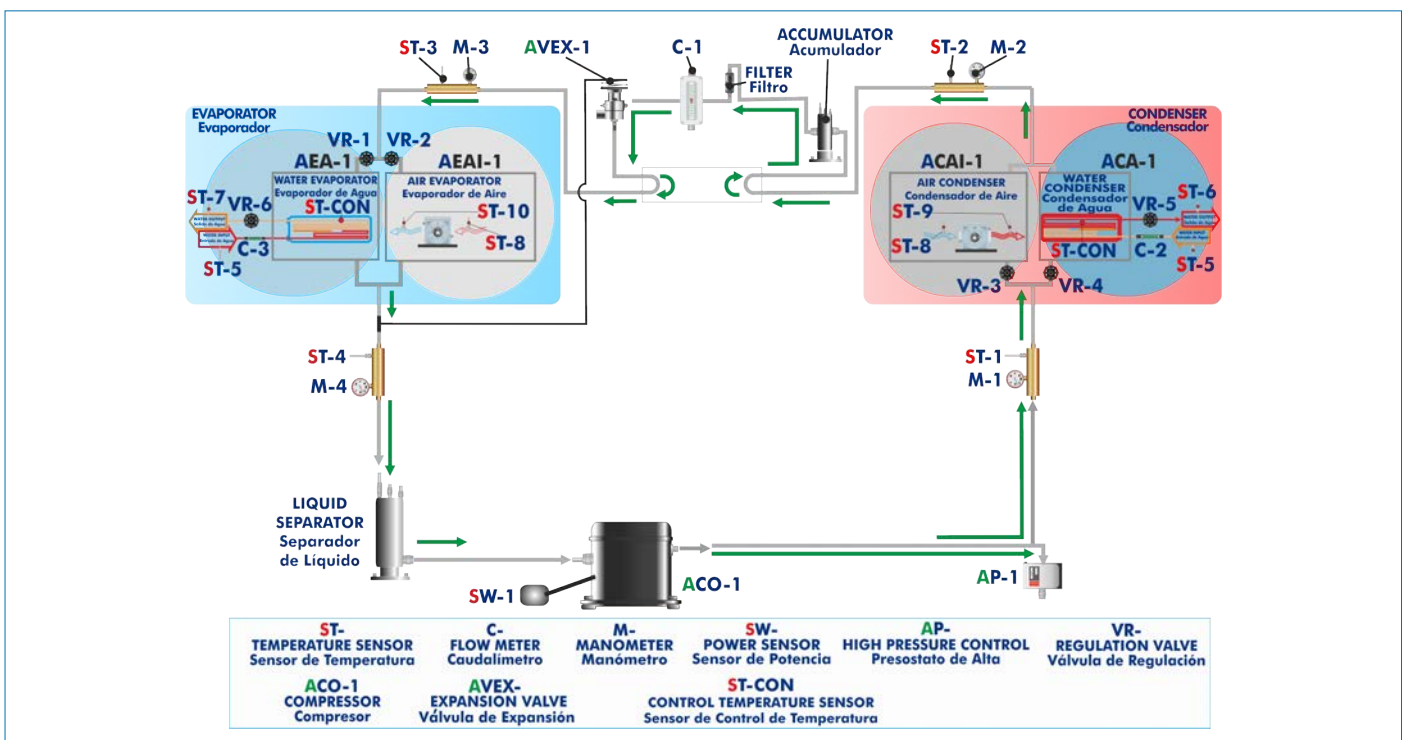
PRODUCTS

90.- THERMODYNAMICS
& THERMOTECHNICS



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)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

Main metallic elements made of stainless steel.

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

Cooling compressor.

Air condenser.

Water condenser.

High pressure control.

Coolant accumulation tank.

Cooling filter.

Expansion valve.

Water evaporator.

Air evaporator.

Coolant division tank.

Four manometers.

Ten temperature sensors (four sensors measure the cooling temperature, three sensors measure the water temperature, three sensors measure the air temperature):

- Temperature sensor, "J" type (compressor outlet).

- Temperature sensor, "J" type (condenser outlet/evaporator inlet).

- Temperature sensor, "J" type (evaporator inlet/condenser outlet).

- Temperature sensor, "J" type (compressor inlet).

- Temperature sensor, "J" type (water inlet).

- Temperature sensor, "J" type (condenser outlet/evaporator).

- Temperature sensor, "J" type (evaporator outlet/condenser).

- Temperature sensor, "J" type (room air).

- Temperature sensor, "J" type (condenser outlet/evaporator).

- Temperature sensor, "J" type (evaporator outlet/condenser).

Flow meters: two water flow meters, range: 0.2 – 2 l/min.

Cooling flow meter, range: 5 – 60 l/h.

Wattmeter.

Enthalpy diagram of the refrigerant R134a.

Electronic console:

- Metallic box.

- Temperature sensors connections.

- Selector for temperature sensors.

- Digital display for temperature sensors.

- Wattmeter display.

- High pressure control connection.

- Fans speed regulators.

- Compressor ON/OFF switch.

- Electronic console ON/OFF 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

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| <ol style="list-style-type: none"> 1.- Determination of the inlet power, heat produced and performance coefficient. Water as heat source. (Water-water heat pump). 2.- Determination of the inlet power, produced heat and performance coefficient. Air as heat source. (Water-air heat pump). 3.- Determination of the inlet power, produced heat and performance coefficient. Air as heat source. (Air-air heat pump). 4.- Determination of the inlet power, heat produced and performance coefficient. Water as heat source. (Air- water heat pump). 5.- Preparation of performance curves of the unit at different inlet and outlet temperatures. Water as heat source. (Water-water heat pump). 6.- Preparation of performance curves of the unit at different inlet and outlet temperatures. Air as heat source. (Water-air heat pump). 7.- Preparation of performance curves of the unit at different inlet and outlet temperatures. Water as heat source. (Air-water heat pump). 8.- Preparation of the performance curves of the unit at different inlet and outlet temperatures. Air as heat source. (Air-air heat pump). 9.- Lay out of the steam compression cycle in a diagram P-H and comparison with the ideal cycle. Water as heat source. (Water-water heat pump). 10.-Lay out of the steam compression cycle in a diagram P-H and comparison with the ideal cycle. Air as heat source. (Water-air heat pump). | <ol style="list-style-type: none"> 11.-Lay out of the steam compression cycle in a diagram P-H and comparison with the ideal cycle. Water as heat source. (Air-water heat pump). 12.-Lay out of the steam compression cycle in a diagram P-H and comparison with the ideal cycle. Air as heat source. (Air-air heat pump). 13.-Preparation of the performance curves of the unit based on the properties of the refrigerant and at different condensation and evaporation temperatures. Water as heat source. (Water-water heat pump). 14.-Preparation of the performance curves of the unit based on the properties of the refrigerant and at different condensation and evaporation temperatures. Air as heat source. (Water-air heat pump). 15.-Preparation of the performance curves of the unit based on the properties of the refrigerant and at different condensation and evaporation temperatures. Water as heat source. (Air-water heat pump). 16.-Preparation of the performance curves of the unit based on the properties of the refrigerant and at different condensation and evaporation temperatures. Air as heat source. (Air- air heat pump). |
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REQUIRED SERVICES

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

RECOMMENDED ACCESSORIES (Not included)

- For refilling R134a refrigerant and maintenance, we recommend:
- T/KIT1. Maintenance Kit, containing: vacuum pump, hoses and manometers.
 - T/KIT2. Maintenance Kit, containing: leakage detector.
 - R134a refrigerant (to be acquired by the customer locally).

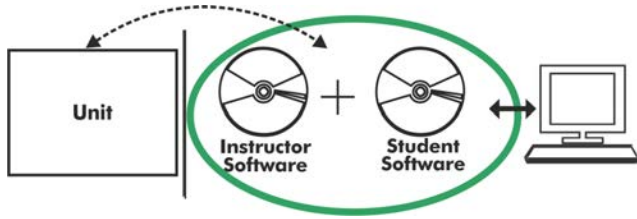
DIMENSIONS AND WEIGHTS

- THAR22B:
Unit:
- Dimensions: 900 x 600 x 500 mm approx.
(35.43 x 23.62 x 19.68 inches approx.)
 - Weight: 100 Kg approx.
(220.46 pounds approx.)
- Electronic console:
- Dimensions: 490 x 330 x 310 mm approx.
(19.29 x 12.99 x 12.20 inches approx.)
 - Weight: 15 Kg approx.
(33 pounds approx.)

AVAILABLE VERSIONS

- Offered in this catalog:
- THAR22B. Heat Pump, Refrigeration and Air Conditioning Unit (two condensers (water and air) and two evaporators (water and air)).
- Offered in other catalogs:
- THAR22C. Computer Controlled Heat Pump, Refrigeration and Air Conditioning Unit (two condensers (water and air) and two evaporators (water and air)).
 - THAR2LC. Computer Controlled Refrigeration and Air Conditioning Unit (two condensers (water and air) and one evaporator (water)).
 - THAR2LB. Refrigeration and Air Conditioning Unit (two condensers (water and air) and one evaporator (water)).
 - THARL2C. Computer Controlled Refrigeration and Air Conditioning Unit (one condenser (water) and two evaporators (water and air)).
 - THARL2B. Refrigeration and Air Conditioning Unit (one condenser (water) and two evaporators (water and air)).
 - THARA2C. Computer Controlled Refrigeration and Air Conditioning Unit (one condenser (air) and two evaporators (water and air)).
 - THARA2B. Refrigeration and Air Conditioning Unit (one condenser (air) and two evaporators (water and air)).
 - THARALC. Computer Controlled Refrigeration and Air Conditioning Unit (one condenser (air) and one evaporator (water)).
 - THARALB. Refrigeration and Air Conditioning Unit (one condenser (air) and one evaporator (water)).
 - THARLLC. Computer Controlled Refrigeration and Air Conditioning Unit (one condenser (water) and one evaporator (water)).
 - THARLLB. Refrigeration and Air Conditioning Unit (one condenser (water) and one evaporator (water)).

THAR22B/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.

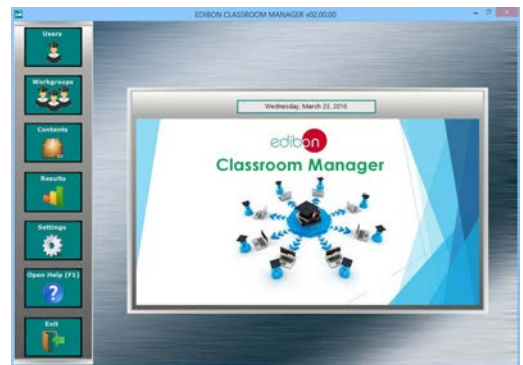
Instructor Software

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

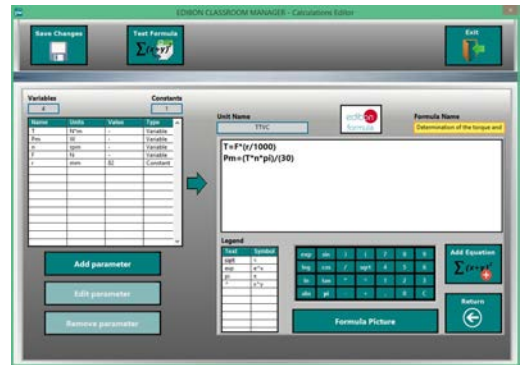
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

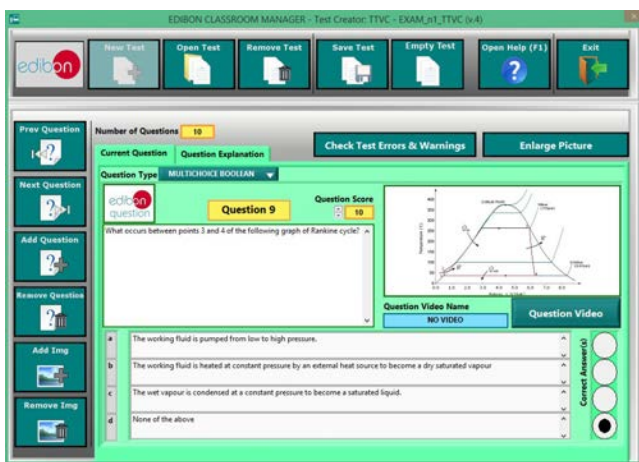
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

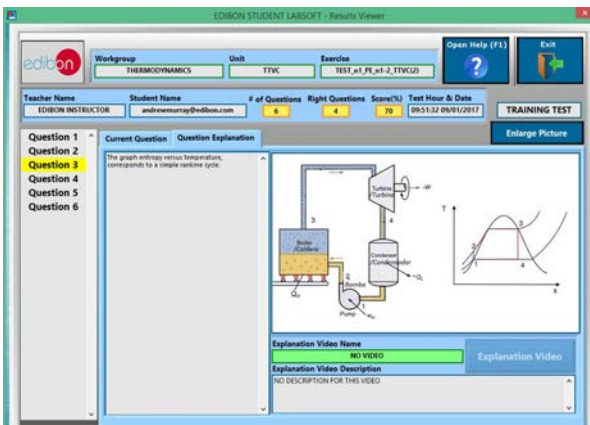
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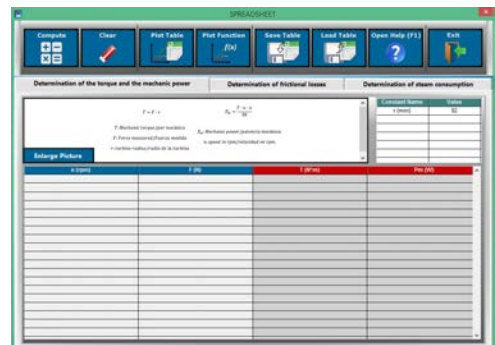
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



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:

