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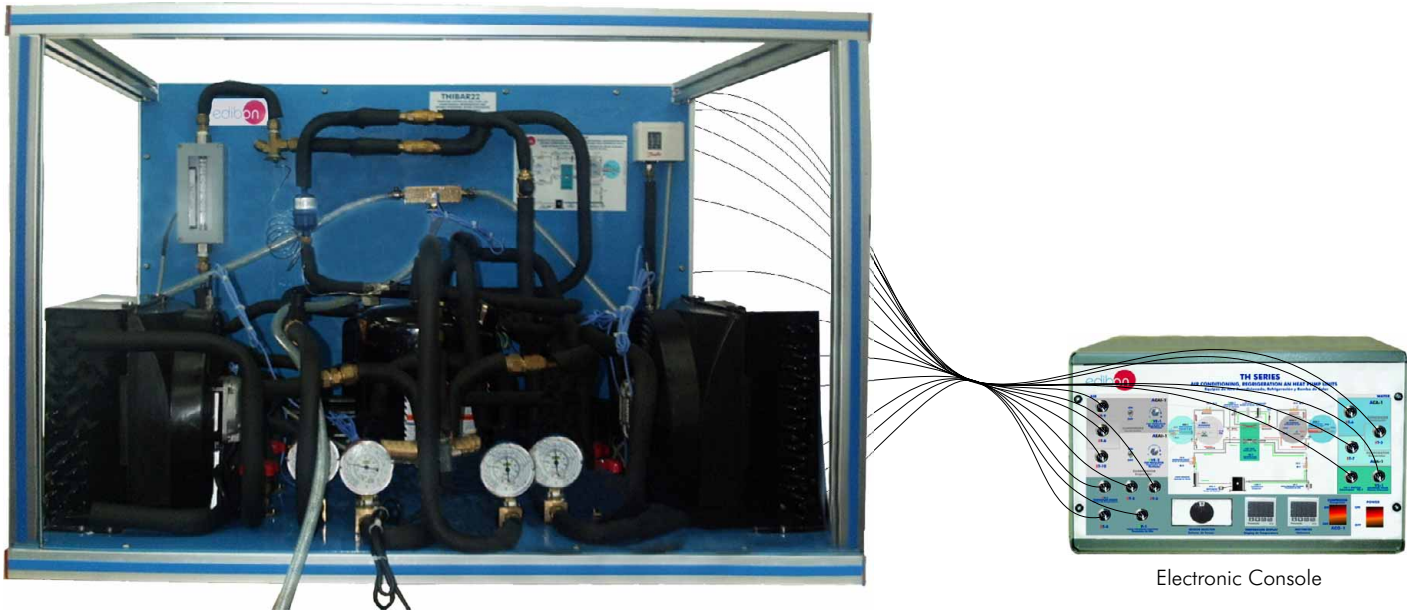
Technical Teaching Equipment

Heat Pump+ Air Conditioning + Refrigeration Unit with Cycle Inversion Valve

THIBAR22B



Electronic Console

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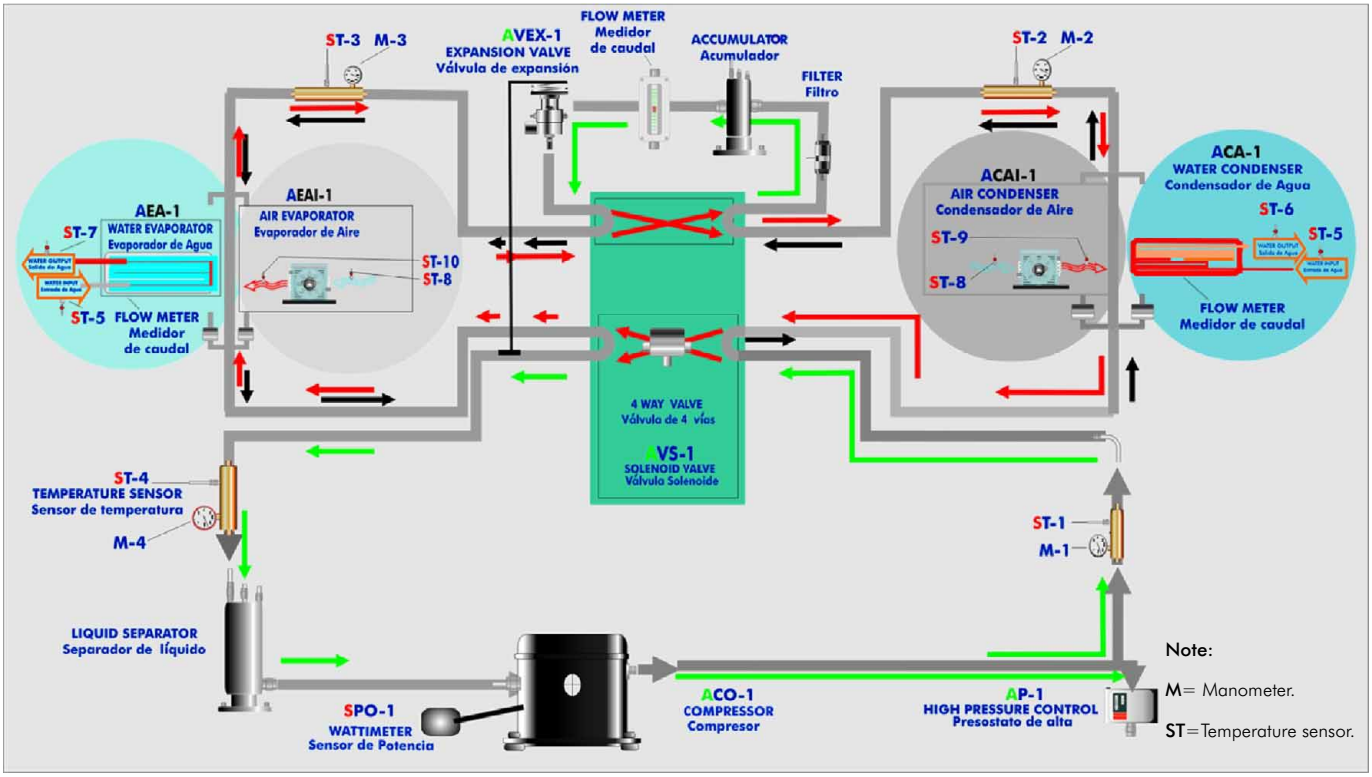
Products
Products range
Units
9.-Thermodynamics & Thermotechnics

PROCESS DIAGRAM AND ELEMENTS ALLOCATION

9 UNITS IN ONE

6 of them Heat Pump + Air Conditioning + Refrigeration and 3 of them Heat Pump + Air Conditioning.

All these units are included in the unit THIBAR22B, as it has 2 EVAPORATORS, 2 CONDENSERS and CYCLE INVERSION VALVE.



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.
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.
Cooling compressor.
Air condenser. Water condenser.
High pressure control.
Coolant accumulation tank.
Cooling filter.
Expansion valve.
Water evaporator. Air evaporator.
Tank of division of the cooling liquid.
4 Manometers.
10 Temperature sensors (4 sensors measure the cooling temperature, 3 sensors measure the water temperature, 3 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).

2 Water flow meters.
1 Cooling flow meter.
Wattmeter.
Cycle Inversion Valve.
Enthalpy diagram of the refrigerant R134a.
Electronic Console:
- Metallic box.
- Temperature sensors connections. Selector for temperature sensors. Digital display for temperature sensors.
- High pressure control connection.
- Fans speed regulators.
- Cycle inversion valve connection.
- Cycle inversion valve switch.
- Wattmeter display.
- Compressor ON/OFF switch.
- Electronic Console ON/OFF switch.

Cables and Accessories, for normal operation.
Manuals: This unit **is supplied whit the following manuals:** Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

Some Practical Possibilities of the Unit:

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 heat pump with different inlet and outlet temperatures. Water as heat source. (Water-water heat pump).
6.- Preparation of performance curves of the heat pump at different inlet and outlet temperatures. Air as a heat source. (Water-air heat pump).
7.- Preparation of performance curves of the heat pump with different inlet and outlet temperatures. Water as heat source. (Air-water heat pump).
8.- Preparation of the performance curves of the heat pump with 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).
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 heat pump 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 heat pump 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 heat pump 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 heat pump based on the properties of the refrigerant and at different condensation and evaporation temperatures. Air as heat source. (Air- air heat pump).
17.- Practices with cycle inversion.

REQUIRED SERVICES

Electrical supply: 220V. ,1-phase + neutral + ground , 50 Hz.; or 110V., 1-phase+ neutral + ground, 60Hz.; and 1 CV max.

Water supply and drainage.

DIMENSIONS & WEIGHTS

THIBAR22B:

Unit:	-Dimensions: 900 x 600 x 500 mm. approx.
	-Weight: 100 Kg. approx.
Electronic Console:	-Dimensions: 490 x 330 x 310 mm. approx.
	-Weight: 15 Kg. approx.

RECOMMENDED ACCESSORIES

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).

AVAILABLE VERSIONS

Offered in this catalogue:

- **THIBAR22B. Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve (two condensers (water and air) and two evaporators (water and air)).**

Offered in other catalogue:

- **THIBAR22C.** Computer Controlled **Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve (two condensers (water and air)and two evaporators (water and air)).**

Other available versions:

- **THIBAR44C.** Computer Controlled **Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve (four condensers (two of water and two of air) and four evaporators (two of water and two of air)).**

- **THIBAR44B. Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve (four condensers (two of water and two of air) and four evaporators (two of water and two of air)).**

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

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REPRESENTATIVE: