

## LHP 103 THERMOTRONICS



The LHP-103 laboratory covers all areas, theoretical and practical, concerning the installation, operation and maintenance of **Refrigeration, Cooling, Automotive Climate Control** and **Air-Conditioning systems**.

The laboratory consists of a set of simulators, trainers and equipment listed on the right of this page.

The laboratory deals with the refrigerating cycle with absorption/diffusion and with liquefiable gas evaporation/compression, the study of several industrial refrigerators and cold stores for food cooling and freezing, the domestic air-conditioning systems, the different spaces air-conditioning and mixed air-conditioning systems, the thermodynamic conversion and the car air-conditioning and climate control.

The laboratory includes all educational equipment and sub-units for the study of Thermotronics applied to domestic and industrial installations.

The laboratory equipment is accompanied by the appropriate software to run interactively with PC workstations, wherever this is applicable.

The software is organized in subjects corresponding to the simulations and the experimental exercises with scope:

- ◆ A series of aims for the specific experiment and the level of knowledge that must be obtained.
- ◆ Theoretical background relevant to the lesson as well as practical examples of use.
- ◆ Tests/Questions for the students and fault testing.

The simulators are accompanied by relevant software to enable the student to follow step-by-step the theory and the exercise. The whole exercise procedure is carried out on the simulators. All systems are accompanied by technical manuals for theory and exercises.

### PT-RF1

Refrigeration Cycle:  
An Introduction To The Cooling Systems

### PT-AC2

Training Unit For The Introduction To Professional Cooling Systems

### PT-AC3

Training Unit For The Introduction To The Complex Air Conditioning Systems

### PTS-3950

Refrigeration Training System

### PTS-3951

Basic Refrigeration Modules

### PTS-3953

Industrial Refrigeration Modules

### PTS-3950

Air Conditioning Training System

### PTS-3952

Basic Air Conditioning Modules

### PTS-3954

Professional Air Conditioning Module

### PTS-3974

Heat Pump & Thermodynamics Theory

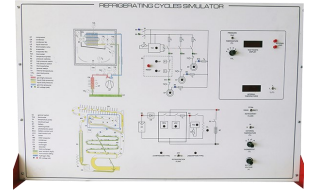
### PTS-3975

Industrial Refrigeration

### PTS-3574

Car Air Conditioning & Climate Control

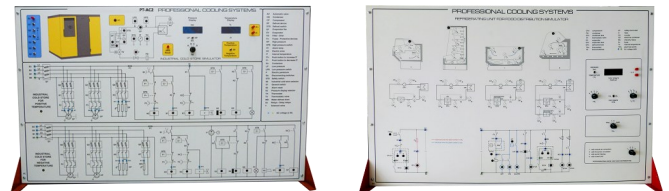
## PT-RF1 Simulator Refrigeration Cycle



The PT-RF1 simulator depicts the Refrigerating Cycle and covers the simulation process in the following topics:

- Thermostat operation;
- Refrigerating cycle on the enthalpic diagram;
- Real COP and comparison with the ideal COP according to the Carnot cycle;
- Intervention of the pressure switch;
- Real COP reduction after the increase of the external temperature under the same test conditions;
- Use of different refrigerating fluids;
- Fault detection.

## PT-AC2 Simulator Professional Cooling Systems



The PT-AC2 simulator is a training unit for the introduction to Professional Cooling Systems. It is 2-sided designed for the study of several industrial refrigerators and cold stores for food cooling and freezing.

**Side A** panel simulates four types of industrial refrigerators:

- Frozen food.
- Natural air circulation.
- Mixed cooling.
- 5 levels forced circulation.

**Side B** panel simulates two types of industrial cold stores:

- Positive temperature store for food refrigeration and preservation.
- Cold store for the preservation of frozen food.

## PT-AC3 Simulator Central Air Conditioning Systems



The PT-AC3 simulator is a training unit for the introduction to the Complex Air Conditioning Systems which consists of two sided desktop unit designed to train student in:

- ♦ Public place - Conference Central air-conditioning and mixed type air-conditioning systems using **Side A** panel.
- ♦ Domestic air-conditioning systems using **Side B** panel.

### PTS-3950-51-53 Trainer Refrigeration Training System



The Refrigeration training system contains 3 modules:

- **PTS-3950** Main Platform Unit
- **PTS-3951** Basic Refrigeration
- **PTS-3953** Industrial Refrigeration

The system is modular and enables intergrading the PTS-3951 or PTS-3953 with the Main Platform unit PTS-3950 in real operation along with all the measurement instrumentation, valves etc.

### PTS-3950-52-54 Trainer Air-Conditioning Training System

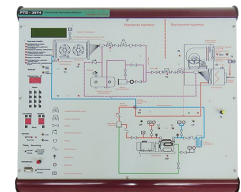


The Air-Conditioning refrigeration training systems contain 3 modules:

- **PTS-3950** Main Platform Unit
- **PTS-3952** Basic Air-Conditioning
- **PTS-3954** Professional Air-Conditioning

The system is modular and enables intergrading the PTS-3952 (Basic Air-conditioning) and the PTS-3954 (Professional Air-conditioning) with the Main Platform unit PTS-3950. The trainer base includes all the components of refrigeration system in real operation along with all the measurement instrumentation, valves etc.

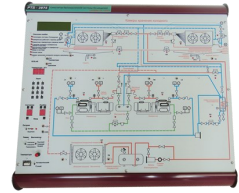
### PTS-3974 Simulator Heat Pump & Thermodynamics Theory



The PTS-3974 Heat Pump & Thermodynamics simulator enables the student to perform several experiments and covers various topics:

- Introduction of Heat pump;
- Simulating the Thermodynamic conversion of heating;
- Simulating the Thermodynamic conversion of cooling and dehumidification;
- Results obtained from the variations in temperature, capacity and circuit pressures;
- Simulating the Thermodynamic cycles of Freon after the changes of external/internal conditions and of the thermal load;
- Troubleshooting and fault simulation.

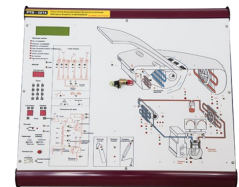
### PTS-3975 Simulator Industrial Refrigeration



This PTS-3975 Industrial Refrigeration Simulator enables the student to perform several experiments and covers various topics:

- Introduction of industrial refrigeration installation;
- Simulate the thermodynamic behavior of air during its passage through exchangers;
- Knowledge of individual components consisted in the system;
- Verification of various modes of installations operation and management;
- Simulate basic techniques for maintenance of refrigeration installations;
- Simulate programming techniques for the adjustment and control of the refrigeration installation techniques in the buildings;
- Troubleshooting and fault simulation.

### PTS-3574 Simulator Car Air- Conditioning & Climate Control



The PTS-3574 Car Air-Conditioning & Climate Control simulator enables the student to perform experiments and covers the following topics:

- Refrigeration circuit components;
- Temperature and pressure characteristics;
- Cooling circuit gas pressure control;
- Condenser fan control;
- Electronic temperature regulation;
- Air distribution control with vacuum valves;
- Air distribution control with stepper motors;
- Fan speed control with electronic switching regulation;
- Climate control automatic and manual operation in relation to external, mixed and internal temperature analysis;
- Various operating conditions and their effect on the climate control system;
- Automatic operation of the system in relation to external, mixed and internal temperature as well as analysis of Manual operation with setting of internal temperature and speed of electric fan;
- Checking the operating conditions: with cold start of air recirculation, the direction of air in relation to the position of distribution opening;
- Connecting and disconnecting conditions of the electric fan on the condenser and of the simulated compressor;
- Choosing of air recirculation, un-fogging function and economic cycle;
- Troubleshooting and maintenance.