



## COLD ROOM



**DL DKF011**

With this system, students can study and analyze the phenomena of the industrial refrigeration.

This system integrates all the main components that can be found in a cold room facility.

This system is composed of modular components and can reach freezing temperatures as low as  $-30^{\circ}\text{C}$ .

### TRAINING OBJECTIVES

With this equipment, students can perform several experiments in the following knowledge areas:

- Heat transfer and thermal insulation.
- Refrigeration cycles of vapor compression.
- Refrigerant fluids.
- Calculation of thermal loads.
- Psychrometric processes (low temperature).
- Cold stores and industrial refrigeration.
- Automatic control and instrumentation.

Approximate dimensions and weight:

- Length: 1000 mm
- Maximum height: 1000 mm
- Width: 1300 mm
- Weight: 87kg

Control panel

The control panel includes:

- Selectors to set all modes of operation.
- Cooling temperature control with LCD display.
- Control unit of the electronic valve.

### TECHNICAL DESCRIPTION

The test bench consists of: a refrigeration chamber with a forced flow evaporator fed by thermostatic expansion valve, a 250W condenser unit and a transparent heated access panel.

The refrigerator circuit is equipped with:

- Flow display.
- Heat exchanger with solenoid valve.
- Electric defrost system.
- Control system via PLC and programmable timing functions.
- Drier filter and liquid storage tank.

The use of separate controls allows the simulation of different malfunctions.

The anti water hammer protection in the compressor system ensures reliable operation under extreme conditions. The steam overheated can be regulated by the thermostat valve settings.

### Requirements:

- Power supply: single phase 230V/50Hz.
- Drain for defrosted water.



## TECHNICAL DATA

### Cold room

- Polyurethane insulation: thickness 50 mm.
- Dimensions: 570x580x760mm

### Evaporator

- Cold room evaporator with fan.

### Condenser

- Hermetic reciprocating compressor for low temperature.
- Rated power: 3/8 hp.

### Defrost system

The equipment includes two defrosting systems:

- By electric resistances in the evaporator positioned inside the chamber.
- By refrigerator gas regulated by a solenoid valve.

### Expansion valve

Two different in-parallel expansion valves, to study and compare the difference in the operation of both types:

- Mechanical expansion valve.
- Electronic expansion valve.

### Pressure switches:

- 2 independent pressure switches for high and low pressure.

### Sight glass:

- To control the conditions of the refrigerant in the liquid phase, the regularity of the flow and the absence of moisture in the circuit. It is possible also to check the oil return to the compressor sump.