

## COLD ROOM



**DL DKF011**

### TRAINING OBJECTIVES

It is possible to 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 rooms and industrial refrigeration
- Automatic control and instrumentation

Approximate dimensions and weight:

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

The control panel includes:

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

This system has been designed for the analysis of the phenomena of the industrial refrigeration. It integrates all the main components that can be found in a cold room facility. The trainer is composed of modular components and it can reach freezing temperatures as low as  $-30^{\circ}\text{C}$ .

It consists of:

- a refrigeration chamber with a forced flow evaporator fed by a thermostatic expansion valve
- a 250W condenser unit
- a transparent heated access panel.

### TECHNICAL DESCRIPTION

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 slugging water hammer system in the compressor ensures reliable operation under extreme conditions. The overheated steam can be set by a thermostat valve.

#### Requirements:

- Power supply: single phase 230V/50Hz.
- Drain for defrosting (if necessary).



## 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:

- Electric: in the evaporator, by electric resistances positioned inside the chamber.
- Gas : by refrigerating gas regulated by a solenoid valve.

### Expansion valve

Two in-line expansion valves for studying and comparing 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 easily and quickly control the conditions of the refrigerant in the liquid phase,
- to check the regularity of the flow and the absence of moisture in the circuit.
- To allow the inspection of the oil when it returns to the compressor crankcase.