

MULTIPLE COMPRESSOR TRAINER

Mod. TCCM/EV

Mod. TCCM-C/EV (computerized vers.)



mod. TCCM-C/EV

INTRODUCTION

The trainer, properly designed for educational purposes, allows to study the combined operation of compressors in a refrigeration system controlled via a regulator (mod. TCCM/EV) or via a control unit/PC (mod. TCCM-C/EV) that switch on and off each compressor depending on the required cooling power. It includes a closed water circuit and a heater to apply a thermal load to the evaporator of the system.

TRAINING PROGRAM

- Study of the combined operation of compressors
- Study of the operation of a compressor pack controller (mod. TCCM/EV)
- Use of the $p - h$ diagram of a refrigerant gas
- Collection of the operating data and calculation of the heat balances and system efficiency
- Electric power consumption measurement depending on the number of active compressors
- Effect of the airflow rate on the condenser performance
- Data acquisition, system supervision and fault insertion via PC (mod. TCCM-C/EV)

TECHNICAL SPECIFICATIONS

- Steel structure mounted on wheels, painted and treated in the oven
- Colour silk-screen-printed schematic diagram of the hydraulic circuit with warning LEDs
- 3 hermetic compressors (2,0 kW refrigeration capacity, temperature: $-10 + 35^{\circ}\text{C}$)
- Variable flow air cooled condenser
- Oil separators, liquid separators, liquid receiver
- Check valves
- Sight glasses, drying filter
- Thermostatic expansion valve
- Water evaporator
- Valve for plant vacuum, refrigerant charging and recovering
- Pipes connecting the various components painted with different colours
- High and low pressure gauges
- Double pressure switch
- Water closed circuit, including 3-speed pump, storage tank, 1.500 W heater, thermostat, pressure gauge
- Mod. TCCM/EV only: compressor pack controller with high pressure sensor for condenser fan speed regulation and low pressure sensor for compressors management
- Mod. TCCM/EV only: complete set of instruments including:
 - 4 digital thermometers with Pt100 probes to be inserted in many temperature test points along the hydraulic circuits
 - Water flowmeter
 - Digital multimeter
- Mod. TCCM-C/EV only: control unit with the following characteristics:
 - Autonomous operation or Remote Control (via PC, not included in the equipment)
 - USB interface for connection with PC
 - Graphic LCD display for visualizing values and trend in time of input signals such as temperature, pressure, water flow
 - Electronic board and converters for input signals
 - Numerical keyboard
 - Application software developed in NI LabVIEW
 - Fault insertion included
- Mod. TCCM-C/EV only: complete set of sensors including:
 - 6 Pt100 temperature probes
 - 1 water flow sensor
 - 2 pressure sensors
 - 1 electric power converter
- Thermomagnetic - earth leakage control button
- Emergency button
- Refrigerant: CFC free

Power supply: 230 Vca 50 Hz single-phase - 3600 VA
(Other voltage and frequency on request)

Dimensions: 130 x 80 x 180 cm

Net weight: 221 kg

SPECIAL VERSION ON DEMAND only for mod. TCCM/EV:

Besides offering the characteristics of standard version, this version also includes:

- Fault simulator using switches,
or
- Fault simulator operating with control unit



REQUIRED

PERSONAL COMPUTER
(for mod. TCCM-C/EV only)
- NOT INCLUDED -



SUPPLIED WITH

EXPERIMENTAL HANDBOOK

