CRC125

REFRIGERATION TROUBLESHOOTING TRAINER 25 FAULTS

Experimental capabilities

- **Identification and mapping of a refrigeration system with semi-hermetic compressor**
- **Commissioning and verification of operation**
- **Study of the basic concept of a refrigeration system.**
- **Study of the thermodynamic cycle on enthalpic diagram.**
- **Simulation of failures on the refrigeration and electrical circuit and on the regulation. (25 failures)**
- **Study of the different modes of expansion.**
- **Study of the coupling of evaporators - parallel.**
- **Calculation of heat balances at the condenser, evaporator, theoretical and practical efficiencies.**
- **Construction of the refrigeration cycle on state diagram.**
- **Role and adjustment of constant pressure valves**
- **Study of the oil circuit**

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Operating principle

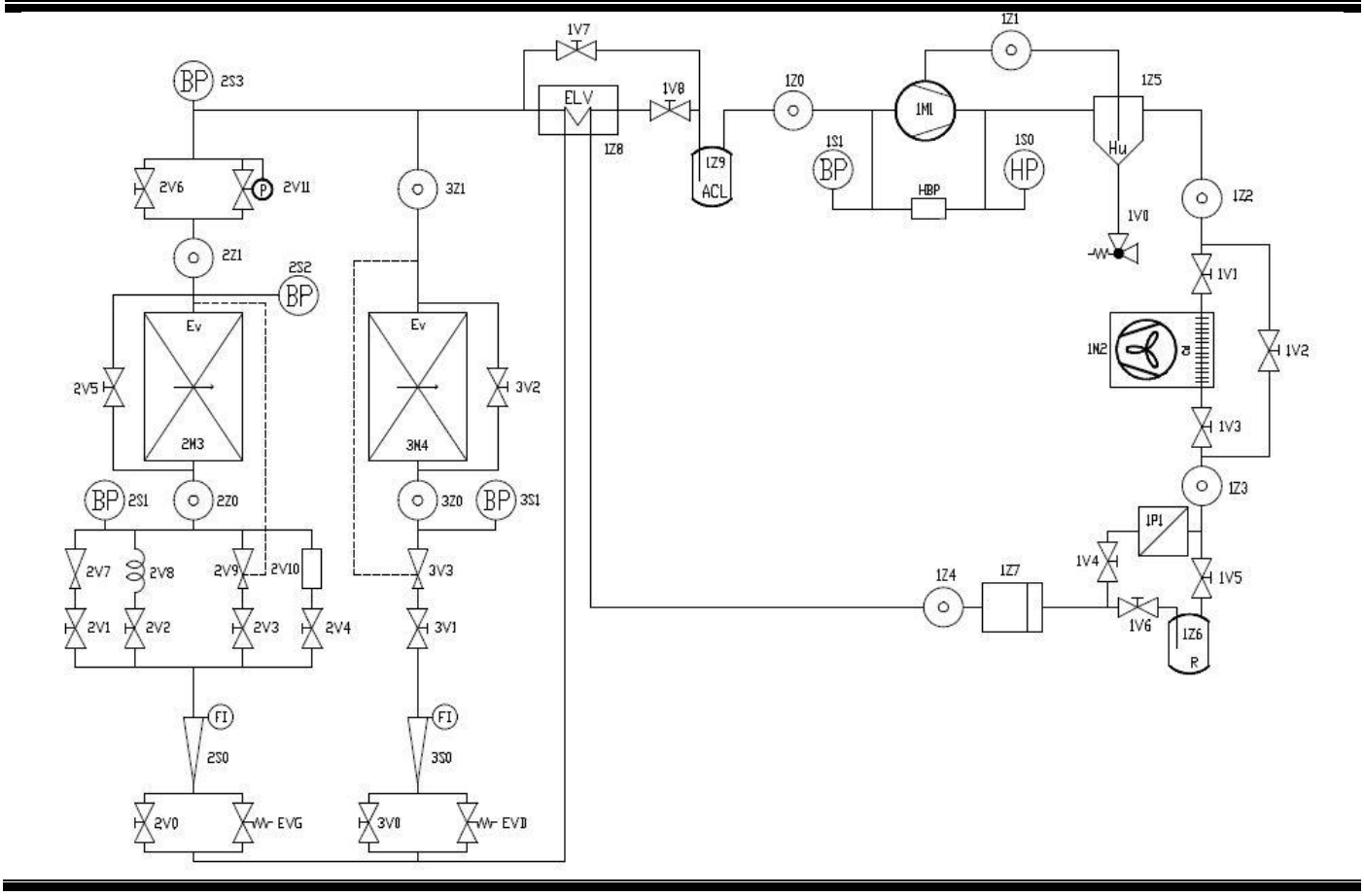
The CRC125 trainer allows the simulation of failures on a refrigeration circuit. It is based on a commercial refrigeration installation with two evaporators and a semi-hermetic condensing unit. Students will begin by identifying the components of the circuit and understanding how the system works. They will then be able to put it into operation and check the operation using fixed instrumentation (pressure gauges and flow meters) and portable instrumentation (thermometer).

When the installation is in normal operation, the teacher can then cause electrical (through the screen) or fluidic (manual valves) failures. Students will then have to make a diagnosis using their findings and the instrumentation at their disposal.

In order to go further in the study of the installation, students will also be able to study the refrigeration cycle of the installation and calculate the powers involved.

The robust design of this equipment makes it perfectly suited for use in schools.
Its anodized aluminum structure on wheels gives it a very high robustness as well as a great flexibility of integration in your premises. The manufacture of this equipment meets the European Machinery Directive

Installation diagram



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Technical details

1. Semi-hermetic compressor, refrigeration capacity: around 2100 W equipped with anti-vibration piping and two service valves
2. Low pressure gauge with dual temperature/pressure scale at compressor suction
3. HLP dual pressure switch (LP regulation-HP safety)
4. High pressure gauge with dual temperature/pressure scale at compressor discharge
5. Safety valve
6. Oil separator with sight glass on the compressor return line
7. Air condenser
8. Pressostatic inverter for high pressure regulation
9. Condenser input and output liquid sight glasses
10. Steel liquid receiver with service valve volume 1.5L
11. Filter dehydrator and fluid sight glass on the liquid line
12. Mono tubular liquid/vapor exchanger
13. Evaporator line N°1 composed of:
    -A control solenoid valve
    -A refrigerant flow meter
    -A thermostatic expansion valve with internal pressure equalization
    -A low-pressure gauge with double temperature/pressure scale at the inlet of the evaporator
    -a fluid sight glass at the input of the evaporator
    -a forced ventilation evaporator (around 400W)
    -a fluid sight glass at the outlet of the evaporator
14. Evaporator line N°2 composed of:
    -A control solenoid valve
    -A refrigerant flow meter
    -A thermostatic expansion valve with internal pressure equalization
    -a capillary expansion valve
    -a constant pressure expansion valve
    -a faulty constant pressure expansion valve
    -A low-pressure gauge with double temperature/pressure scale at the inlet of the evaporator
    -a fluid sight glass at the inlet of the evaporator
    -a forced ventilation evaporator (around 400W)
    -a fluid sight glass at the outlet of the evaporator
    -a evaporator pressure regulator
    -a box simulating a cold room with thermostat
15. A suction accumulator (volume: 2.3L)
16. A low-pressure gauge with dual temperature/pressure scale at the outlet of the evaporators
17. A set of manual valves to create fluidic failures detailed in educational applications
18. An electrical power supply cabinet including:
    -mandatory protective elements (emergency stop, general disconnector, differential circuit breaker)
    - circuit breakers and relays necessary for operation
    -a touch screen for the simulation of failures
    -3 control modes (thermostatic, pressostatic and pump down)
19. The trainer is supplied with a portable thermometer, two thermocouple wired probes and a contact probe.
20. The trainer is supplied with a removable bin for condensate collection.

Services required

- Power supply : 230 Vac – 50 Hz – 10 A
- Power supply type: 1 phase(s) + Neutral + Earth.
- Dimensions: (LxWxH mm): 1700 x 650 x 1740
- weight (Kg): 220

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

Documentation

- User's manual
- Pedagogical manual
- Technical documentation of the components
- Lab exercises
- Fluidic diagram
- Wiring diagram
- Enthalpic diagram
- Certificate of conformity CE

Recommended equipment

- Data acquisition and real time enthalpic diagram box
- Ref : SUP 120

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