

CONDITIONING AND REFRIGERATION

T108/1D - Demonstrative Refrigeration Study Unit - Code 953841



1. Generality

The T108/1D is an extremely easy-to use and functional unit able to clearly visualize all the determinant phases of a compression frigorific cycle, particularly the condensation and evaporation phenomena.

A front panel with mimic diagram and instrumentation allows to keep the most significant thermodynamic quantities under control, so facilitating the students' understanding and the teacher's task.

The unit is supplied with manuals which describe the components, the installation and utilization procedures as well as many exercises with experimental results.

2. Composition

The unit includes:

- hermetic motor/compressor unit, piston type
- water/R134 evaporator
- water/R134 condenser

- manual isenthalpic expansion valve
- dehydrator filter
- flow meter with control valve of the H₂O delivery at the condenser
- flow meter with control valve of the H₂O delivery at the evaporator
- pressure gauge for condensation pressure
- pressure gauge for evaporation pressure
- maximum pressure switch
- N. 2 temperature digital indicators
- N. 2 temperature selectors
- N. 8 temperature probes type Pt100
- Magnetothermic differential switch, manual controls, signaling lamps and protection fuses.

3. Description

The main characteristic of the unit is that to enable the student to observe the effect of the cooling fluid on the condenser and the evaporator, being glass realized.

A piston type hermetic compressor provides the compression work. The cooling fluid is R134, which combines good thermodynamic characteristics with a high safety degree, while the evaporating and condensing fluid is network water. The cooling gas isenthalpic expansion is realized by a manual micrometrical valve in order to allow the student to verify the influence of the expansion on the thermal balance of the cycle.

The instrumentation is inserted into the actual cycle and allows to constantly check all the main parameters: two digital instantaneous thermometers with switches visualize one the inlet temperatures and the other the outlet temperatures, two flowmeters visualize the evaporation and condensation water flow rates and two pressure gauges visualize the condensation and evaporation pressures. The instrumentation comes with a complete synoptic panel allowing the immediate understanding of the frigorific cycle.

4. Technical features

- compressor power 270 W, capacity 538 kcal/h with evaporation -40°C
- condenser capacity 1200 cm³ approx.
- evaporator capacity 1200 cm³ approx.
- water consumption 200 l/h approx.

5. Experiences

- study of the compression frigorific cycle
- study and visualization of condensation and evaporation
- heat balance of the evaporator and the condenser
- theoretic and real efficiency of frigorific cycle
- study of expansion effect on frigorific cycle
- construction of frigorific cycle on a state diagram lg(p) vs h

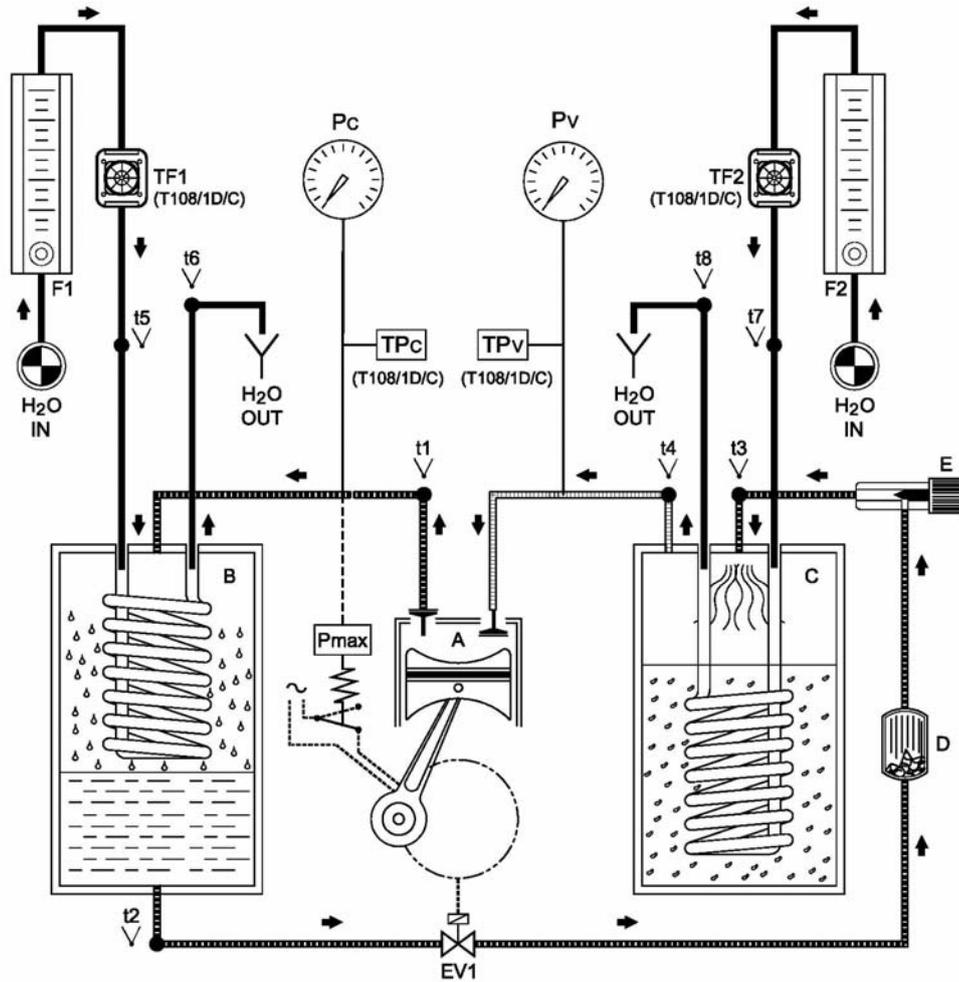
6. Services required

- Electric supply: 220V single-phase, 50Hz
- Water supply: net water, maximum pressure 3 bar

7. Weight and dimensions

- Dimensions: 600 x 600 x 1530 h mm
- Net weight: 110 kg

8. Synoptic



Keys:

- A. hermetic motor/compressor unit, piston type
- B. water/R134 condenser
- C. water/R134 evaporator
- D. dehydrator filter
- E. manual isenthalpic expansion valve
- EV1. safety solenoid valve for the R134 circuit
- t1. temperature sensor: condenser coolant inlet
- t2. temperature sensor: condenser coolant outlet
- t3. temperature sensor: evaporator coolant inlet
- t4. temperature sensor: evaporator coolant outlet
- t5. temperature sensor: condenser water inlet
- t6. temperature sensor: condenser water outlet
- t7. temperature sensor: evaporator water inlet
- t8. temperature sensor: evaporator water outlet
- F1. flow meter with control valve of the condenser H₂O flow rate
- TF1. flow transducer for the condenser H₂O flow rate (on T108/1D/C only)
- F2. flow meter with control valve of the evaporator H₂O flow rate
- TF2. flow transducer for the evaporator H₂O flow rate (on T108/1D/C only)
- Pc. pressure gauge for condensation pressure
- TPc. pressure transducer for condensation pressure (on T108/1D/C only)
- Pv. pressure gauge for condensation pressure
- TPv. pressure transducer for evaporation pressure (on T108/1D/C only)
- Pmax. maximum pressure switch.

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In any time and without notice, Didacta Italia can carry out any appropriate modification on the product details, always maintaining their main features, according to the designing and teaching necessity.