

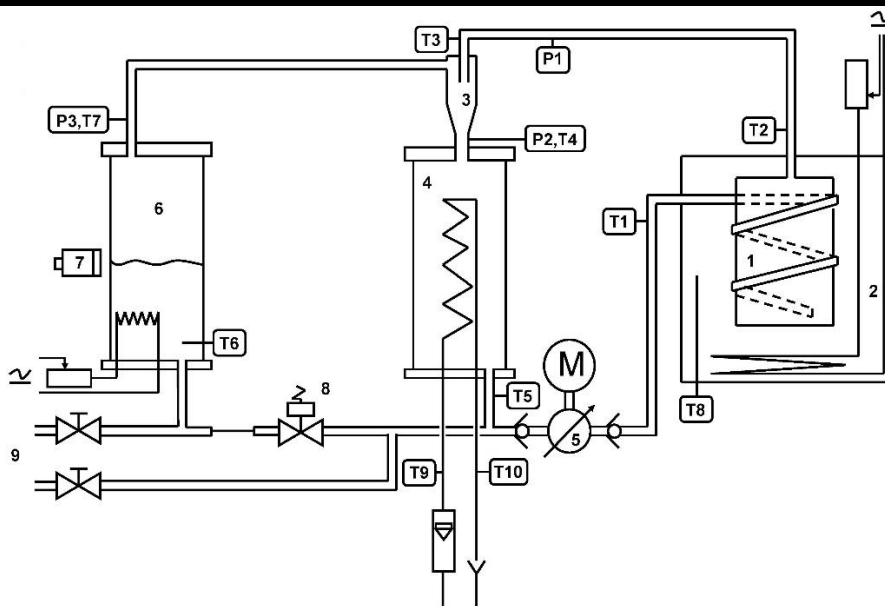
COMBINED RANKINE AND VAPOUR COMPRESSION REFRIGERATION CYCLE



Experimental capabilities

- To understand and trace thermodynamic cycles experimentally.
- Study of the Rankine cycle.
- Plot of combined cycles on enthalpic diagram.
- Calculation of the cooling capacities at the evaporator, at the condenser at the ejecto-compressor, as well as at the steam generator.
- Calculate the heat balances at the exchangers and the operating efficiencies.
- Calculation of the efficiencies.

Illustrations



Technical details

1. Boiler

Volume 0,68 l
Liquid pre-heater, copper coil 1/4"

2. Immersion circulator

Volume of the tank : 5 l
Heat transfer fluid: Oil
Heating power : 2 kW

3. Ejector-compressor

Suction and compression of the refrigerant steam

4. Condenser

Glass casing - Copper exchanger
Cooled by water

5. A metering pump with variable flow rate

Equipped with nonreturn valves at the suction and discharge
Maximum pressure: 10 bar
Maximum flow rate: 20 l/h

6. Evaporator

Glass casing
Cartridge heater with adjustable power
Heating power : 200W

7. Evaporator low level detector

ON/OFF level regulation and safety switch for heating cartridge

8. Solenoid valve

Regulation of the fluid level in the evaporator

9. Machine service valves

The trainer is installed on an aluminum profile structure.

It has an electrical box with a main power disconnect switch and a 30mA differential circuit breaker.

Instrumentation

Three measures of pressure
Ten temperature measurements by thermocouple T type
Evaporator heating cartridge power measurement
Touch screen (7") for displaying the temperatures and the electrical power of the heating cartridge with a synoptic of the installation.
Variable area flowmeter and regulating valve on the condenser water circuit.

Services required

- Electrical supply : 230 Vac – 50 Hz – 20 A
- Electrical network : 3 phase(s) + Neutral + Earth.
- Water supply : 4 L/min – 1bars
- Water drain : on the floor
- Dimensions: (LxWxH mm): 1000 x 670 x 650
- weight (Kg): 80

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
- Wiring diagram
- Fluidic diagram
- Software : data acquisition system
- Certificate of conformity CE

Data acquisition system

The trainer is supplied with data acquisition software for recording data to an Excel-type file. The connection between the Computer and the trainer is WIFI type

