

CONCENTRIC TUBES HEAT EXCHANGER STUDY UNIT



Experimental capabilities

- Study of a concentric tubes exchanger
- Comparison of a co-current circulation or counter-current
- Temperatures and flow rates measurements
- Thermal power calculation
- Calculation of the exchange coefficient
- Study of the influence of hot and cold water flow rates
- Demonstration of the laminar and turbulent regimes

Operating principle

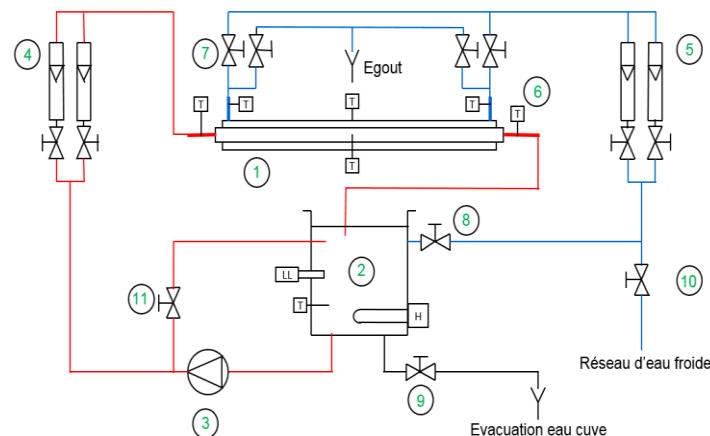
The BET 040 bench allows to study a concentric tubes exchanger system. The hot water produced in the stainless steel tank is heated by a heating resistor, it is then sent to the exchanger thanks to a centrifugal pump. Cold water comes from the water supply network. The instrumentation allows the user to follow what happens in the exchanger. They can measure the water flows and temperatures. All of the valves will allow to change the direction of the water inside the exchanger and allow operation in co-current or counter-current.

After a stabilization period, students must record the operating parameters (temperature, flow rate) in order to calculate the different values required in the practical works.

The robust design of this equipment makes it perfectly suited for use in schools.

Its anodized aluminum structure on multidirectional wheels with brakes makes it extremely robust as well as great flexibility of integration into your premises. The manufacturing of this equipment meets the European machine directive

Illustrations



Electrical box power supply. Including: protections (circuit breakers ...) power switch, switch-on button, digital indicators for temperature probes of the exchangers and indicator / tank temperature control with thermostat

Technical details

- 1. A heat exchanger with concentric tubes**
Equipped with several temperature measurements
- 2. Stainless steel tank of hot water**
Tank capacity 70 L
3 kW electrical resistance for heating water
Low level probe
Safety thermostat
Temperature probe, thermocouple of type T
- 3. Centrifugal pump with magnetic drive**
Maximum flow rate of 570 L/h
- 4. Hot water flowmeters with needle control valve and selector valve of the flowmeter used.** Scales: 0.2-3 L/min and 1-10 L/min
- 5. Cold water flowmeters with needle control valve and selector valve of the flowmeter used.** Scales: 0.2-3 L/min and 1-10 L/min
- 6. 6 thermocouples of type T** for measuring the temperature of the hot water and the cold water inlet, at the middle and at the outlet of the exchanger
- 7. 4 Selector valves of co-current mode or counter-current**
- 8. Filling valve of the hot water tank**
- 9. Drain valve of the hot water tank**
- 10. Inlet valve of cold water to connect to the network**
- 11. By-pass valve**

Services required

- Power supply: 230 VAC – 50 Hz – 32 A
- Power supply Type: 1-Phase + Neutral + Earth
- Cold Water supply: 20 L/min – 2 bars
- Cold water drainage: at ground level
- Volume hot water tank: 70 L
- Dimensions: (LxWxH mm): 1700 x 700 x 1600
- weight (Kg): 135

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
- Certificate of conformity CE