BET104

3 THERMAL EXCHANGERS STUDY UNIT-COMPUTERIZED

Experimental capabilities

- **Provide opportunities for students to experimentally compare the performance of several types exchangers that can be found in industrial plants.**
- **Comparative study of three exchangers technologies: plates, stainless steel tube bundle with glass grille, air-water unit heater.**
- **Comparison of a co-current circulation and of a counter-current**
- **Calculation of thermal power**
- **Calculation of exchange coefficient**
- **Study of the influence of water flow rates**

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version : FT-BET104-STD-A

BET104

Operating principle

The bench BET100 allows the study of three industrial type heat exchangers.
The bench comprises a reserve bin with a resistor which produces the hot water. Cold water comes from the establishment network.
The students will first need to select the exchanger to study and connect the inputs and outputs of water using hose equipped with self-sealing couplings. The flow rates are adjusted using multi-turn valves with handle.

After a stabilization period, students must identify the operating parameters (temperature, flow rate) in order to calculate the different values required for the practical exercises
The robust design of this equipment makes it suitable for use in schools.
The bench is constructed around an anodized aluminum profiles structure (dimensions 45x45 mm and 90x90 mm) on multidirectional wheels (100mm diameter) with brakes which gives it great strength as well as great flexibility of integration into your premises. The manufacturing of this equipment meets the European machine directive

Illustrations

The set allows in particular:

The comparison a co-current operation and counter-current on all the exchangers
- The comparison of different technologies of exchangers
- Calculation of powers exchanged and of the conductances

Technical details

1. Flowmeters of cold water with needle adjusting valve and selection valve of the flowmeter used. Scales: 15-150L/h and 100-1000 L/h

2. Stainless exchanger plates, surface equal to 0.5m² minimum. Equipped with four temperature measurement at the input and output of cold water and hot water, circulation mode selection using self-sealing quick couplings

3. Stainless Exchanger with stainless tubular beam, surface equal to 0.5m² minimum. Grille glass with drain valve at the lower part. Equipped with four temperature measurement at the input and output of cold water and hot water, circulation mode selection using self-sealing quick couplings

4. Hot water tank in stainless steel and with lid. Effective volume: 100L. Heating resistors: 15KW. Low level sensor and built-in safety thermostat

5. Electrical supply box. Including: safety system, protections (circuit breakers ..) power supply switch, button to switch on, multi lane indicator for temperature probes of the exchangers and tank temperature indicator with thermostat

6. Flowmeters of hot water with needle adjustment valve and valve selection of the flowmeter used. Scales: 15-150L/h and 100-1000L/h

7. Air-water unit heater exchanger made of galvanized steel with a capacity of 13.7 kilowatts with a maximum air flow rate of 1750 m3/h. It is equipped with four input temperature measurement and the output of the air and hot water selection of circulation mode using self-sealing quick couplings. Measuring the electrical power of the fan.

8. Pump for circulating the hot water in stainless steel. Max pressure: 2.3bars. Max flow rate: 3000L/H. Maximum temperature of the pumped water: 100°C

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Services required

- Power supply: 400 VAC – 50 Hz – 32 A
- Power supply type: 3 phases + Neutral + Earth.
- Water supply: network 20 L/min – 2 bars
- Water drain: at ground level
- Water Capacity: 100 L
- Dimensions: (LxWxH mm): 1800 x 800 x 1825
- weight (Kg): 180

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

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