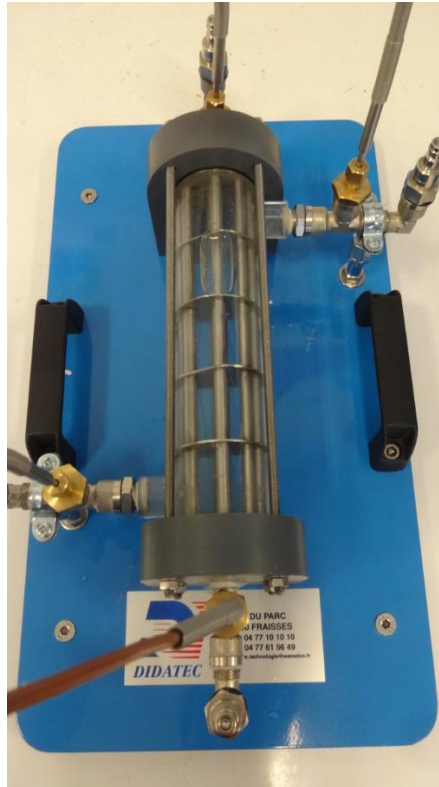


SHELL AND TUBE HEAT EXCHANGER



Experimental capabilities

In conjunction with BET 011 supply unit:

- function and behaviour during operation of shell and tube heat exchanger
- plotting temperature curves
- in cross parallel flow operation
- in cross counterflow operation
- calculation of mean heat transfer coefficient
- comparison with other heat exchanger types

Operating principle

The BET 014 is part of a series of units enabling experiments to be performed on different heat exchanger types. In conjunction with the BET 011 supply unit, which has a hot and cold water circuit and all of the necessary connections, the experimental unit is ideally suited for investigating the functioning and behaviour of a shell and tube heat exchanger in operation.

The BET 014 is connected to the BET 011 using quick-release couplings. The shell and tube heat exchanger consists of seven tubes, surrounded by a transparent outer shell. The hot water flows through the tube space and the cold water through the space in the shell. Part of the thermal energy of the hot water is transferred to the cold water. Baffle plates are used to deflect the flow in the shell in such a way as to create greater turbulence and thus a more intensive transfer of heat. The media flows continuously in a crossflow. Valves on the supply unit are used to adjust the flow rates of hot and cold water. The supply hose can be reconnected using quick-release couplings, allowing the flow direction to be reversed. This allows cross parallel flow and cross counterflow operation. Temperature sensors for measuring the inlet and outlet temperature are located at the supply connections on the BET 011.

The robust design of this device makes it suitable for use in schools.

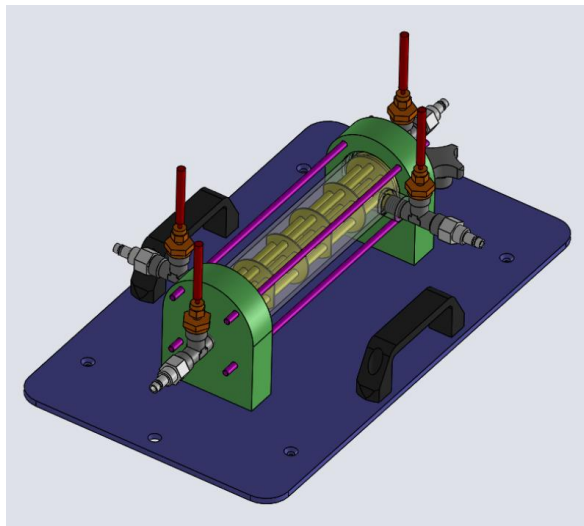
The equipment is set up on an steel coated frame. The frame is also equipped with adjustable feet with rubber to avoid vibrations.

This gives it great strength and a flexibility of integration into your laboratory.

The manufacture of this equipment complies with the European standard for machinery manufacturing.

Illustrations

Technical details



Shell and tube heat exchanger for connection to BET 011

Tube bundle,

- material : stainless steel
- outer diameter : 6 mm
- inside diameter : 4 mm
- wall thickness : 1 mm minimum
- Heat transfer area : 244 cm²

Outer tube

- shell, transparent (PMMA)
- outer diameter: 50 mm
- inside diameter : 44 mm
- wall thickness: 3mm

Transparent shell, visible tube bundle

Tube bundle consisting of 7 tubes and 4 baffle plates

Cross parallel flow and cross counterflow operation possible

Hot and cold water supply from BET 011

Measurement of temperature with BET 011

- temperature: 4 thermocouple
- 4 sensors : inlet and outlet
- Thermocouple type T

Recording of temperature using BET 011

Services required

Documentation

- Hot water supply : BET 011
- Cold water supply : BET 011 with characteristics 2 L/min – 3 bars
- Dimensions : (L x W x H mm) : 400 x 230 x 150
- weight (Kg): 3

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

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