PTC060

FREE AND FORCED CONVECTION TRAINER

Experimental capabilities

- **Free and forced convection experimental setup**
- **Determine average surface heat transfer coefficient for different shapes**
- **Heat transfer measurement in free or forced convection for the different shapes :**
  - **Flat vertical plate ;**
  - **Exchanger consists of several lines of cylinders**
  - **Exchanger consists of one cylinder**
  - **Exchanger with vertical thin plates (sheets)**

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version : FT-PTC060-STD-C

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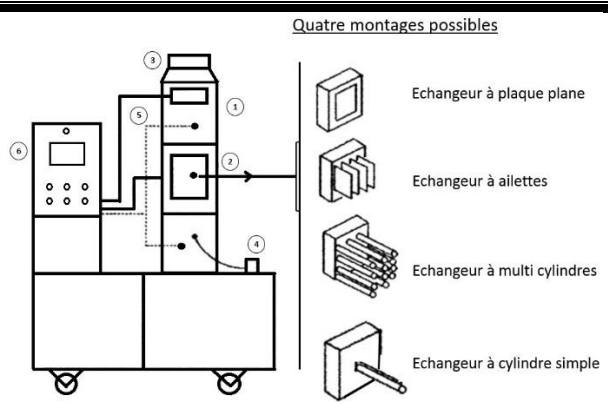
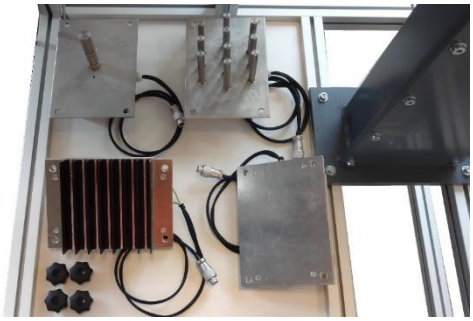
Operating principle

The PTC060 trainer allows the study of free or forced convection. The bench is composed of a vertical tower in which an opening has been made to place four types of exchangers to be tested (flat plate, multi-cylinder, single cylinder, fins). These are connected directly to the control cabinet via quick connectors. Free convection is done by simple draft, forced convection is done by an adjustable speed fan placed in the upper part of the tower.
The instrumentation makes it possible to measure the exchanges and set the parameters. The instrumentation consists of an anemometer, an air inlet temperature probe and an air outlet temperature probe and a surface temperature probe.
The user can choose the electrical power (and therefore the flow) sent to the element in place.

The robust design of this equipment makes it perfectly suited for use in schools.
Its anodized aluminum structure on wheels makes it extremely robust and a great flexibility of integration into your premises. The manufacturing of this equipment meets the European Directive machine.

Technical details





The bench is installed on an aluminum profile structure equipped with four directional braked casters.
It has an electrical box with a main power disconnect switch and a 30mA differential circuit breaker.

1. Rectangular air duct
Section: 100 x 150 mm
2. Test area with four fixtures
- Flat plate heat exchanger:
-surface: 0.0225m², power: 200 W
- Finned heat exchanger:
-surface: 0.0922m², power: 200 W
-Multi-cylinder heat exchanger:
-surface: 0.0349m², power: 200 W
-single cylinder heat exchanger
-surface: 0.0059m², power: 200 W

3. Variable speed fan
-Local speed controller
4. Hot wire anemometer
5. Temperature probes inlet and outlet of the duct
-type T thermocouple
6. Control box equipped with:
- Start buttons, emergency stop, main disconnect switch and indicator light
- differential protection and circuit breaker
-7 inch touch screen for displaying measurements and adjusting the heating power
-Quick connectors for the fan and resistors
- wifi module for connection to a PC

Services required

- Electrical supply : 230 VAC – 50 Hz – 10 A
- Electrical network : 1 phase + Neutral + Earth.
- PC not included
- Dimensions: (LxWxH mm): 1000 x 800 x 1800
- weight (Kg): 90

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
- Wiring diagram
- Lab exercises
- Certificate of conformity CE

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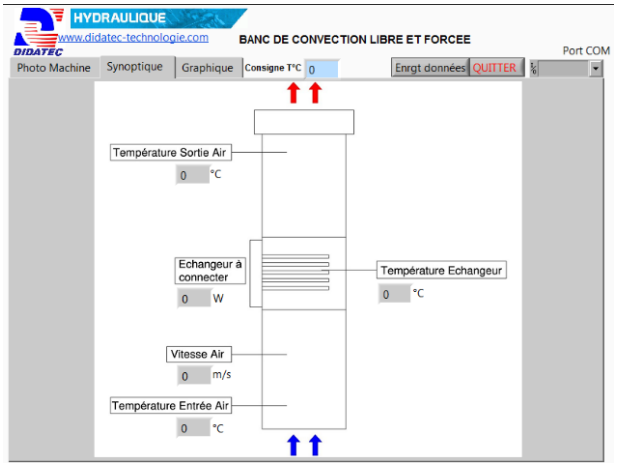
Data acquisition system

The trainer is also equipped as standard with a data acquisition system. The connection towards the PC is made with a WIFI connection. The software is divided into two parts:

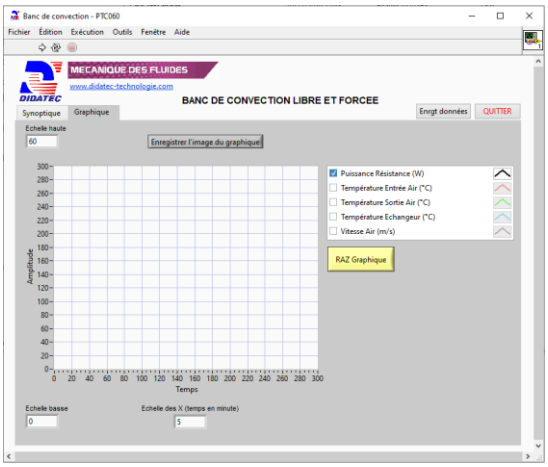
SYNOPTIC:

We find in this window the block diagram of the machine with the location of various measures of process and their values



GRAPH:

We find in this graph window, the possibility of drawing the measurement curves as a function of the time by selecting the desired quantities.



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