

NATURAL CONVECTION AND RADIATION STUDY UNIT



Experimental capabilities

- Calculation of exchanges by radiation and convection
- Draw the warm-up and cooling curves of the two bodies
- Draw the absorption and emission curves of the two bodies under vacuum

Operating principle

The PTC 040 bench includes two enclosures, a heated enclosure and cooled enclosure. The goal is to study the effect of the convection and of the radiation on a circular element introduced in the enclosures.

For this we will study the evolution of the temperature during the transition from an enclosure to another.

The study was conducted on two types of sample (grey and black) and in two different conditions (under atmosphere and vacuum).

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

Its anodized aluminum structure on wheels 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

Technical details



Electrical box including:

- A white light for voltage presence
- A temperature controller
- A voltmeter and an ammeter
- Digital display of temperatures / pressure (x4)
- A button of M/A of the electrical resistance
- A main power disconnect switch
- A push button allowing to read the voltage and current

- Float flowmeter 0,3 – 3 L/min**
Allowing to measure the cooling water flow rate
- Thermocouple of type T**
Allowing to measure the water outlet temperature
- Multi-turn control valve**
Allows adjustment of the cooling water flow rate
- Thermocouple of type T**
Allowing to measure the water inlet temperature
- Vacuum pump**
Allows to remove the air contained in the enclosure
- Fitting (x2)**
Allows to connect the supply and discharge of cooling water
- Filter regulator 0-10 bars**
Allows to adjust the pressure of the compressed air
- Test enclosure**
Heated enclosure and cooled for testing
- Grey test element**
Allows to test the radiation and convection on an element of $\varnothing=15\text{mm}$
- Black test element**
Allows to test the radiation and convection on an element of $\varnothing=15\text{mm}$

Services required

Documentation

- Power supply: 230 V mono – 50 Hz – 16 A
- Water supply: 0,4 L/min – 2 bars
- Dimensions: (LxWxH mm): 800 x 600 x 700
- weight (Kg): 45

- 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