PCB050

SINGLE STAGE COMPRESSOR STUDY UNIT

Experimental capabilities

- **Study of a two-stage air compressor**
- **Calculation of power, efficiency, performance**
- **Study of air-water exchangers**
- **Representation of the compression on a T-S diagram, determining the polytropic coefficient of compression and of isentropic efficiency of the compressor**
- **Measurement of flow rates and pressures**
- **Flow rate-pressure ratio**

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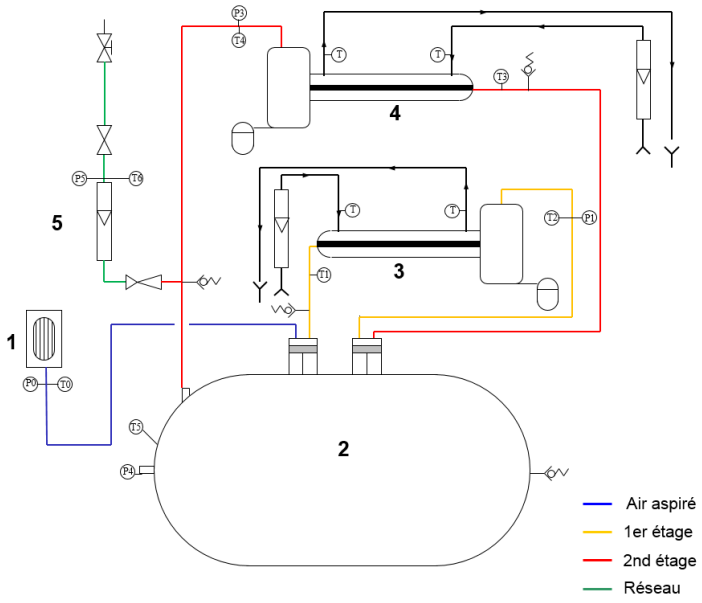
version : FT-PCB050-STD-B

PCB050

Operating principle

The PCB100 bench allows to study the operating principle of a two-stage air compressor.
The ambient air is drawn at the level of a filter is found allowing to measure of pressure and temperature.
The air passes successively through two air-water exchangers (1st stage and 2nd stage) connected to the water network of the institution.
At the output of second exchanger, the air returns in the tank then at the level of a pressure reducer connected to an output of air flowmeter. The robust design of this equipment makes it suitable for use in schools.
Anodized aluminum structure on multidirectional wheels with brakes gives it a very robust as well as a high flexible integration into your premises.The manufacturing of this equipment meets European machine directive

Illustrations



Technical details

1. **Air filter**

2. **Air compressor**
   - Compressor with two-stage piston
   - Construction according to CE standards
   - Volume sucked to treat 41 m3/h
   - Maximum pressure : 11 bars
   - Electric engine by belt transmission
   - Power : 4 kW
   - Tank capacity : 270L

3. **Exchanger air-water first stage**
   - Tubular exchanger cooled by water (exchange counter-current or co-current)
   - Water separator with automatic drainer at the output

4. **Air exchanger - water second stage**
   - Identical to the 1st stage

5. **Flow rate measurement by diaphragms**
   - Automatic pressure reducer for the output pressure control (3 bar)
   - Float flowmeter
   - Control valve at the output and exhaust silencer

6. **Instrumentation**
   - Eleven air temperature sensors and water at different points of the installation with a digital screen
   - Five sensors pressure (at the suction and discharge of each stage, for example)
   - Three safety valves
   - An air float flowmeter
   - Two cooling water numeric flowmeters
   - A wattmeter
   -

Services required

- Electrical supply : 400 Vac – 50 Hz – 20 A
- Electrical network : 3 phases + Neutral + Earth.
- Water supply : 15 L/min – 3 bars
- Water drain : on the floor
- Dimensions: (LxWxH mm): 2500 x 800 x 2000
- weight (Kg) : 280

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
- Software of supervision
- Certificate of conformity CE

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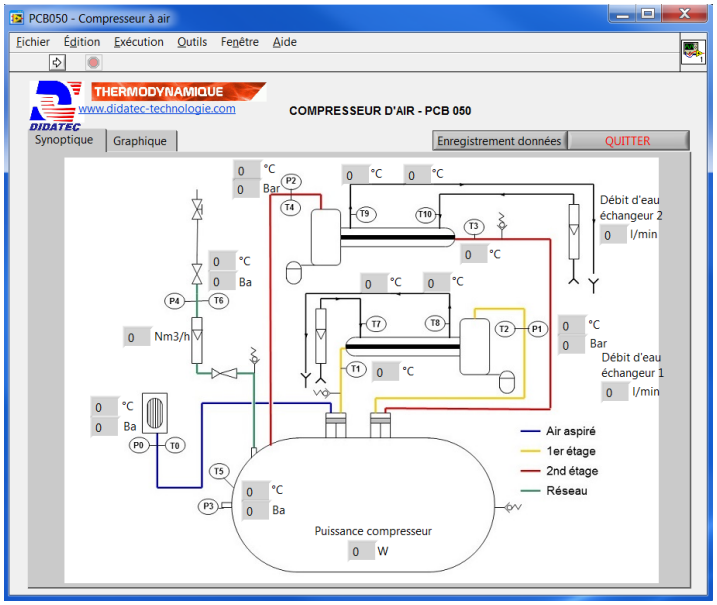
Monitoring: Parameter setting, Plot of curve

The bench is also equipped as standard with a monitoring and configuration software. The connection towards the PC is made via a standard USB port. The software is divided into two parts:

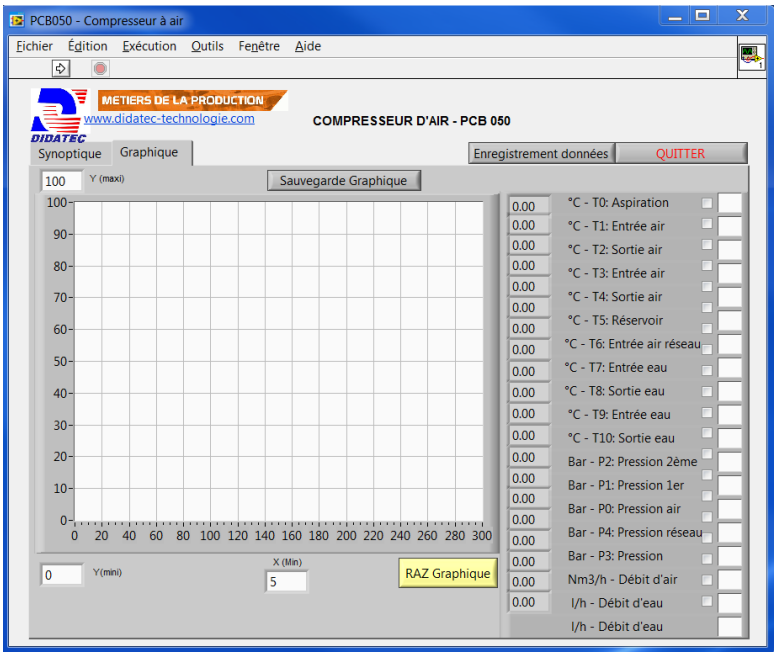
BLOCK DIAGRAM :



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

GRAPHICS :

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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