PCB100

TWO-STAGE AIR COMPRESSOR AND ORIFICE PLATES TRAINER

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**
- **Study of pressure losses in the diaphragms (suction and discharge)**
- **Measurement of flow rates and pressures**
- **Flow rate-pressure ratio**

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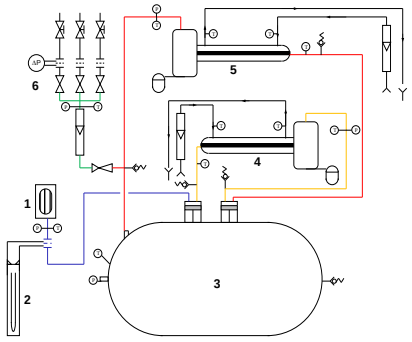
version : FT-PCB100-STD-F

PCB100

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 where a diaphragm is found allowing to measure the incoming air flow by means of a manometer column.
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 as well as three diaphragms connected to a differential pressure sensor allowing to measure the air outlet flow rate.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

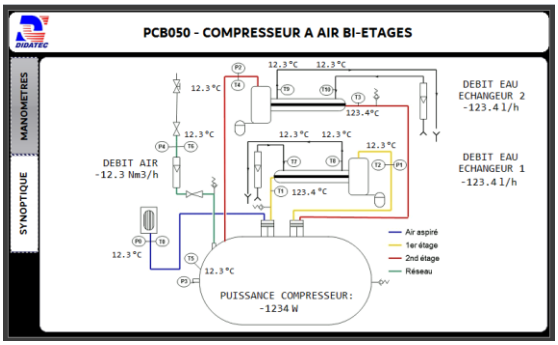
Illustrations

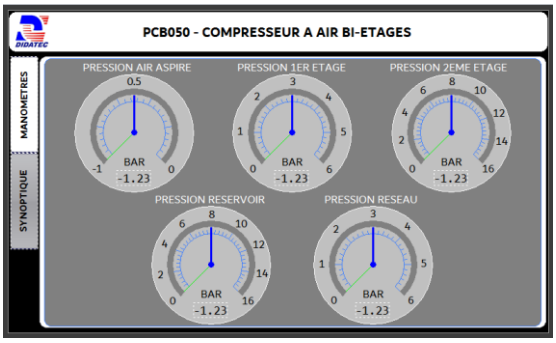


1. **Air filter**
2. **Measure of the incoming air flow with orifice plate and water column manometer**
3. **Air compressor**
   - Reciprocating Compressor with two stages
   - Manufacturing according to CE standards
   - Max incoming Air flow 41 m3/h
   - Maximum pressure: 10 bar
   - Electric motor with belt transmission
   - Power: 4 KW
   - Volume of the tank : 270L
4. **Exchanger air-water first stage**
   - Tubular exchanger cooled by water (exchange counter-current or co-current)
   - Water separator with automatic drainer at the outlet
5. **Air exchanger - water second stage**
   - Same as the 1st stage
6. **Flow rate measurement by orifice plates**
   - Automatic pressure reducer for the outlet pressure control (3 bar)
   - Float flowmeter
   - 3 orifice plates
   - Control valve at the outlet and exhaust silencer

Technical details

7. **Instrumentation**
   - 11 air temperature sensors and water temperature sensors at different points of the installation.
   - 5 pressure sensors (at the suction and discharge of each stage)
   - 3 safety valves
   - 1 U-tube manometer
   - Four orifice plates (x1 air inlet and x3 air outlet)
   - 1 flowmeter (air)
   - 2 flowmeters (water)
   - An electrical power meter
   - 1 differential pressure sensor
   - 7" touch screen to display the datas





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Services required

- Electrical supply : 400 Vac – 50 Hz – 20 A
- Electrical network : 3phase(s) + Neutral + Earth.
- Water supply : 15 L/min – XX bars
- Water drain : on the floor
- Dimensions: (LxWxH mm): 2100 x 800 x 2000
- weight (Kg): 300

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
- Wiring diagram
- Pneumatic diagram
- Certificate of conformity CE

Options

- Data acquisition system
- Ref : PCB101

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