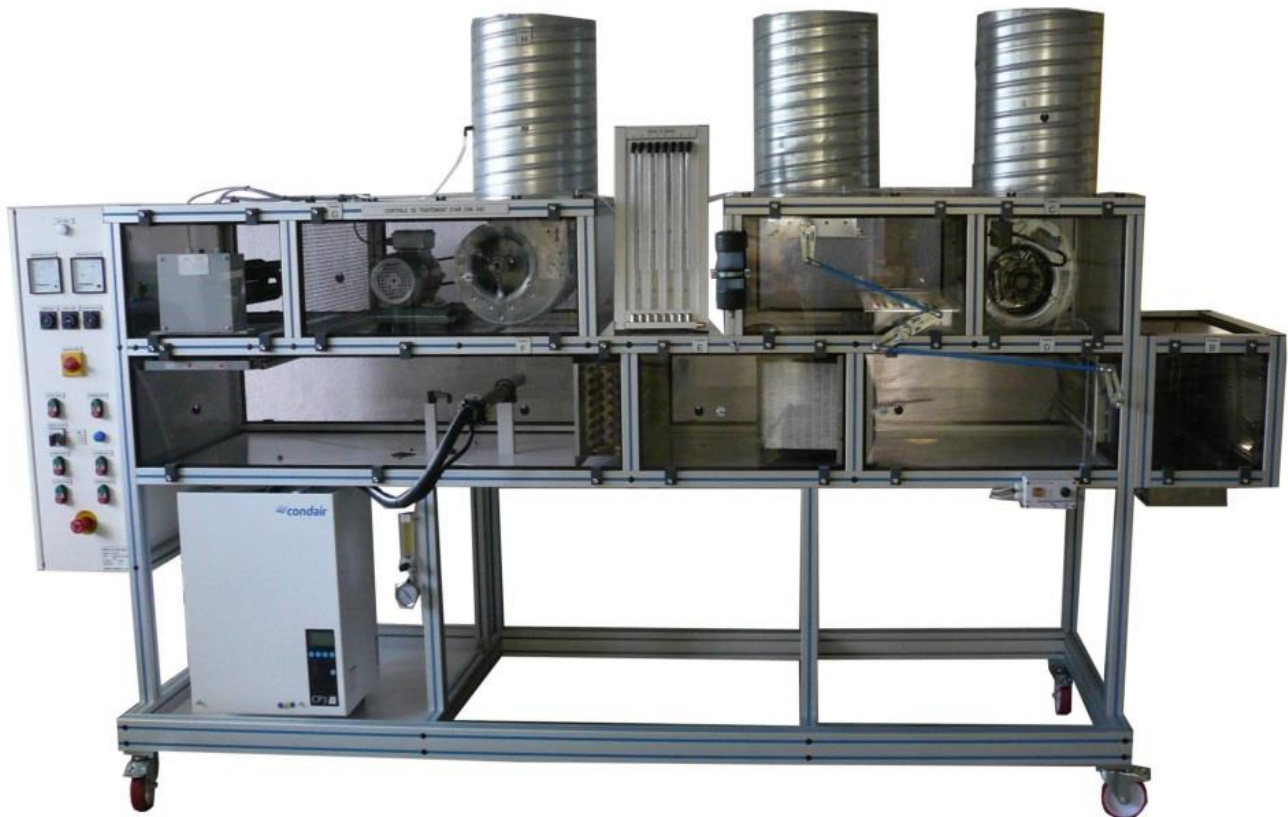


## AIR HANDLING UNIT



### Experimental capabilities

- Identification of the components of an air handling unit dual-flow and a chilled water production unit.
- Commissioning and operating control of a plant.
- Measurement of the operating parameters (air temperature, air humidity, air speed, differential pressure).
- Study of heat exchange and transformation of air (electric heating coil, chilled water cooling coil, humidifier).
- Drawing of air cycle on a psychrometric diagram.
- Drawing of the characteristic curves of the air blower (pressure according to flow rate)
- Air filter maintenance (measurement of pressure losses, replacement operation of the filter)
- Maintenance of the droplet separator (removal, cleaning, mounting)
- Maintenance of the air blowing unit (removal of the belt, fitting a new belt, adjustment of alignment and of the tension)

## Operating principle

The CRA542 bench allows the study of an industrial air handling unit dual-flow type (two fans). It includes the classical elements of a network of air treatment, namely: filters, a cooling coil, humidifier, electrical heating coil, an air blower, exhaust blower and mixing dampers.

Students will initially identify the components of the plant and the direction of airflow.

They will then turn on the system under the conditions prescribed by the teacher (cooling mode or heating mode).

When the operating mode is established, they should measure the operating parameters (temperature, humidity, air flow rate) with portable devices provided.

The following work is to analyze the measurements by drawing the air cycle on a psychrometric chart and calculating powers exchanged.

The air handling bench is also made to perform maintenance operations:

-verification that the filters are clean (with differential pressure measurement) and replacement operation

-verification of the air blower operation (measuring the manometric height generated based on speed)

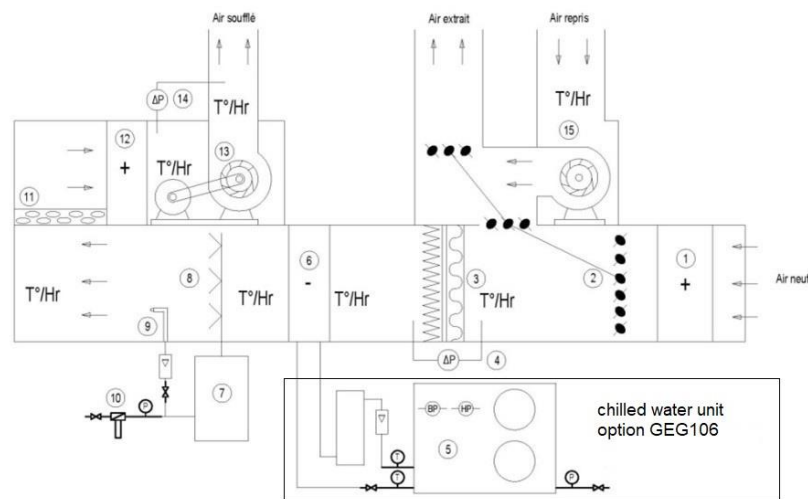
-cleaning droplets separator (with disassembly and reassembly operation)

-replacement of the air blower belt with disassembly operation, reassembly and adjustment of alignment and of the tension

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

Its anodized aluminum structure on feet gives it great robustness as well as great flexibility of integration into your premises. The manufacturing of this equipment meets the European machine directive.

## Illustrations



## Technical specifications

1. Heating coil for fresh air simulation
  - Electric coil with safety thermostat
  - Three power stages: 2.5KW or 7.5KW or 5KW
2. Mixing air dampers between the fresh air and the recycled air
  - system of three dampers (fresh air, mixed air, exhaust air)
  - manual adjustment of the position
  - dampers linked by a hinge linkage
3. Air filters
  - system consisting of two filters (opacimetric and gravimetric)
  - the filters are removable
4. Measurement points for pressure losses of the filters (connection points of the portable device supplied)
5. Chilled water production unit (option)
6. Water cooling coil adapted to the power of the water chiller (5)
7. Humidifier with adjustable flow rate 0-100%
  - steam production: 5kg /h
  - automatic filling and drain
8. Steam injector made of stainless steel with condensate drainage.
9. Air washer nozzle with the flow rate control valve and float flowmeter (1.2-12L /h)
10. Water supply comprising a stop valve, a 25 $\mu$  filter and a pressure manometer (0-6bars)
11. Droplet separator made of stainless steel, removable
12. Heating coil for air handling
  - electric coil with safety thermostat
  - power adjustable from 0 to 100% (0 to 6.5KW)
13. Supply air blower
  - motor and blower coupling by pulley-belt system
  - motor with power 1.1KW mounted on a plate with tensioner
  - centrifugal blower (70mmH<sub>2</sub>O-2900m<sup>3</sup> /h)
14. Measurement points for the head of the fan
15. Return air blower
  - direct coupling between motor and blower
  - variable speed motor with power 0.75KW
  - centrifugal blower

## Additional technical specifications

### Electrical box of the installation:

The machine has an electrical box compliant with European standards. It contains at least:

- a general power disconnect
- a 30mA differential circuit breaker
- the necessary circuit breakers and relay circuitry for the operation
- the pushbuttons and indicator lights necessary for the operation
- an emergency stop button
- a speed controller for air supply fan
- two dimmers for the handling coil
- an ammeter and voltmeter for measurement of the supply to the water chiller.
- three potentiometers graduated from 0 to 100% for the control of:
  - the air blower
  - humidifier
  - the handling heating coil
- a four positions commutator for the selection of the power of fresh air coil (2.5KW, 7.5KW or 5KW)

### Instrumentation provided:

The machine comes with the following portable instruments:

- a portable digital anemometer
  - a portable digital thermo-hygrometer
  - a portable digital thermometer with two wire thermocouple probes
  - a digital differential pressure manometer
- Each unit is supplied in a briefcase with instructions for its use

The bench also includes a water column manometer indicating the pressure losses in the network. It consists of 8 measurements tubes (0-250mm) and a water reserve.

## Services required

- Power supply : 400 Vac – 50 Hz – 40 A
- Power supply Type: 3 phase(s) + Neutral + Earth.
- Water supply : 3 L/min – 2 bars
- Water disposal: at ground level
- Dimensions: (LxWxH mm): 3595 x 960 x 1650 (2110 with the chimney)
- weight (Kg): 390

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
- Fluidic diagram
- Aeraulic diagram
- Certificate of conformity CE

## Recommended equipment

- Chilled water unit
- Ref : GEG106