

## CASCADE BOILERS SYSTEM



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### Experimental capabilities

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- Identification of the components of a heating circuit with fuel boilers and control circuits.
- Commissioning of a heating system and verification of operation
- System setting and basic measurement readings (consumptions, temperatures, pressures, flow rates)
- Advanced measurements and calculation of the powers involved and consumptions
- Study of heat transfer
- Study and adjustment of a three way valve control system (boiler only)
- Study and adjustment of a cascade boiler control system
- Study of the combustion on a fuel burner

## Operating principle

The TCF130 bench allows the study of 2 boilers in cascade. It is composed of a production system (fuel boilers), a primary circuit, an expansion tank, 2 circuits with control on 3 way valve and 2 electrical box with digital heating controller.

The boiler heats the water to a high temperature and the 3 way mixing valve adjust the starting temperature according to the parameters set by the students (heating curve, outside temperature).

The students will first start the system (fill in water...) and then make basic measurements to validate the operation. They will then be able to make more complete study of the system with the help of the integrated instrumentation (thermal balance, study of the controller...) and optional modules proposed.

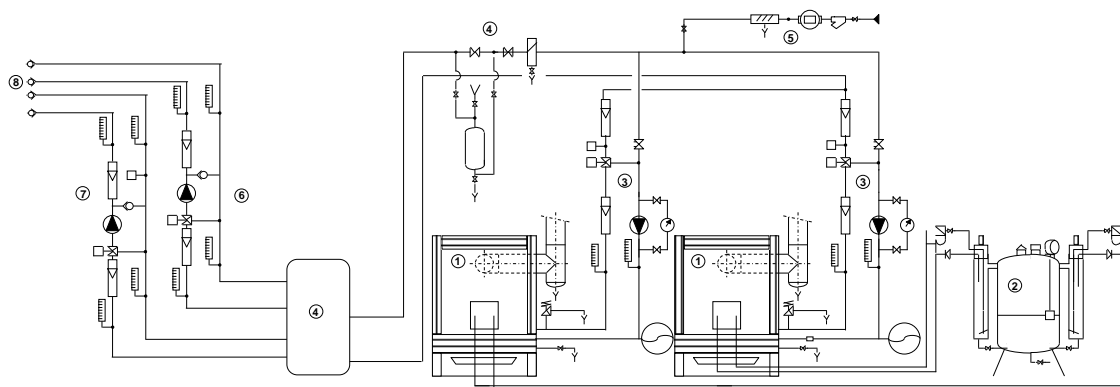
The robust design of this equipment makes it perfectly suited for school use.

Its anodized aluminum structure on wheels makes it very robust as well as a great flexibility of integration into your premises.

The manufacture of this equipment meets European machine directive

This equipment can be used alone or with other compatible devices in our range (see last section of this document).

## Illustrations



## Technical specifications

- 2 boilers with fuel burners 25KW approx. Boiler equipped with valve, trap, drain valve, burner, expansion tank and exhaust connection.
- 2 fuel tanks, capacity 30L, reference TAN030 brand DIDATEC
- A water circuit for each boiler including:  
A water pump type 25-60 with pressure gauge, two float flowmeters, a three way mixing valve with electric actuator, a temperature sensor linked to the controller, two dial thermometers and a balancing valve.
- A common primary circuit to both boilers including a 12l injection tank with valve set, a 100l heat insulated buffer tank with drain valve and air vent, and a dirt separator with air vent
- A water filling line including a stop valve, a volumetric meter, a filter and a backflow preventer
- A high temperature circuit including a 25-60 type water pump, two float flowmeters, a three way mixing valve with electric actuator, a temperature sensor linked to the controller, four dial thermometers and a balancing valve.
- A low temperature circuit including a 25-60 type water pump, two float flowmeters, a three way valve with electric servomotor four dial thermometers, a balancing valve and a control valve, surface mounted safety thermostat.
- Quick couplings for connection of optional modules
- Structure:  
Profile of anodized aluminium screwed  
Casters wheels with brake and no marking trade.

## Electrics Technicals specifications

1. Each boiler is equipped with an electrical box controlling the three way valve situated at the back of the boilers. A potentiometer simulates the outside temperature for testing. Each boiler can therefore operate independently as a single boiler.
2. The cascade control is integrated on the boilers. The cascade control module also controls the two regulated circuits at the outlet of the buffer tank.
3. The bench also includes a general box with all the necessary protections (differential circuit breaker, emergency stop, general disconnecter...)

## Services required

- Power supply: 220Vac - 50 Hz - 25 A
- Electrical supply Type: 1-Phase + Neutral + Earth.
- Water drain: at ground level
- Smoke exhaust: Diameter 125 mm
- Supply in Fuel: light fuel
- Dimensions: (LxWxH in mm): 3100 x 1820 x 1900
- weight (Kg): 550

## Documentation

- User's manual
- Pedagogical manual
- Technical documentation of the components
- Wiring and hydraulic diagrams
- 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

## Options

- Combustion Analyzer
- Smoke test pump
- Pressure measurement kit for fuel pump
- Ref : KIG100
- Ref : SMO001
- Ref : MPF001

## Additional compatible equipment

- Unit Heater
- Radiators bench
- Bench heating floor
- Hydraulics balancing unit
- TA balancing briefcase
- Fan convectors
- Ref : AER033
- Ref : TCF120
- Ref : TCF121
- Ref : TCF 122
- Ref : TCF 123
- Ref : TCF124