

EDUCATIONAL SYSTEM FOR THE STUDY OF HEATING SYSTEMS

Mod. CTR/EV

INTRODUCTION

This educational system can be used for technical and professional exercises on plants descriptions, operation and control. The equipment represents a heating system for civil applications including an oil burner powered boiler and radiators of different shape and material. Boiler, radiators, pipes, checking, control and measuring devices are mounted on a vertical panel that clearly shows position, connections and assembly of all the apparatuses. This system is equipped with castors and is prearranged for the connection with possible external users.

TRAINING PROGRAM

- Procedures for:
 - water filling and air bleeding from the system
 - draining and checking system tightness
 - starting the plant and checking the tripping of boiler safety and protection devices
- Protection and safety devices of a heating plant
- ON/OFF control: boiler thermostat, room thermostat, recirculation pump thermostat
- Modalities for counting and calculating the used thermal energy
- With optional item flue-gas analyzer:
 - evaluation of boiler combustion efficiency
 - variation of air and fuel flow rate to the burner and verification of the effects on the combustion efficiency
 - assessment of the quality of the coupling between burner and boiler

TECHNICAL SPECIFICATIONS

- Steel structure mounted on wheels, painted and treated in the oven
- Cast iron floor-installed boiler with forced draught oil burner:
 - completely automatic operation
 - equipped with safety and operation thermostats
 - flue-gas collection and exhaust system including thermometer
 - thermal power: 20 kW
 - provided with switchboard, pushbuttons and warning lights
- Metallic fuel tank
- Automatic water filling device
- Air separator, expansion vessel, automatic bleed valves, pressure gauge
- Anti-condensation by-pass circuit including recirculation pump, check valve, on-off valves, control thermostat
- Fuel shut off valve, safety pressure switch, safety valve
- Delivery and return manifolds
- Water circulation pump with insulation valves
- Four radiators of proper power: one of aluminium, one of cast iron and two of steel, provided with valves, lockshield valves, bleed valves; all these radiators are connected, operating and fixed onto the main panel; the accessories installed on each radiator enable the complete system control and balancing
- Flowmeters
- Room thermostat
- Switchboard with thermomagnetic - earth leakage control button



Power supply: 230 Vac 50 Hz single-phase - 300 VA
(Other voltage and frequency on request)

Dimensions: 180 x 73 x 195 cm

Net weight: 245 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water at 1 bar min.
- Chimney for flue gas exhaust ($\varnothing = 145$ mm)
- Water drain

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK



OPTIONAL (REF. ACCESS. AND INSTRUMENTS)

**FLUE-GAS ANALYZER
MOD. FGA-1**



**FLUE-GAS ANALYZER - BASIC VERS.
MOD. FGA-E**

As an alternative to mod. FGA-1