

# GAS TURBINE SIMULATOR

## Mod. STG/EV

### INTRODUCTION

Many of the electric energy production plants adopt the turbogas technology. The simplest type of gas turbine system is a single shaft line and consists of multistage compressor (extracted air from the outside is compressed), combustion chamber (combustion of fuel added to the compressed air) and turbine (expansion of the gas coming from the combustor occurs).

The power developed in the expander is partly absorbed by the compressor and the remaining part it is supplied to the coaxial electric generator.

A considerable amount of heat is dissipated in the environment; therefore often the solution is adopted with regenerative heat exchanger for the recovery of heat from the gas leaving the turbine, which go to preheat the combustion air entering the liner of the combustion chamber.

The STG/EV simulator properly studies the type of system just described.

### TRAINING PROGRAM

The simulator is proposed to facilitate the understanding of the operation of cycles based on the use of gas turbines. It will be possible to study:

- Electrical parameters:
  - Power absorbed by the Compressor
  - Power supplied by the turbine
  - Power balances' computation
  - Active power and reactive power required by users in OFF design phases
- Thermodynamics conditions:
  - Construction of plant scheme
  - Efficiency calculations
  - Real-time visualization of temperature and pressure in different points of the cycle
  - Exhaust gases recovery example

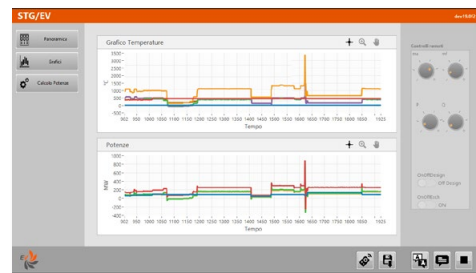
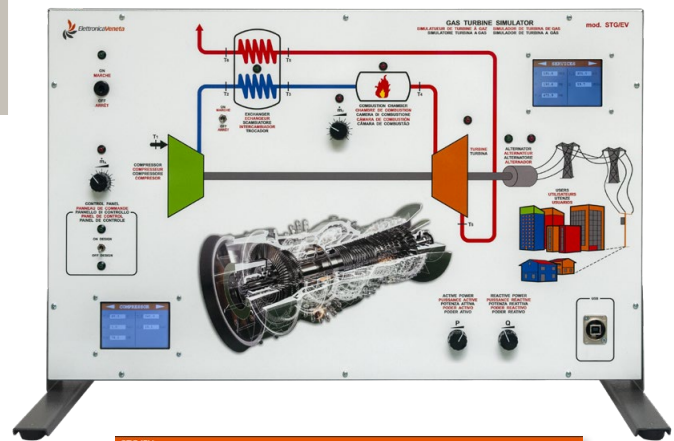
### TECHNICAL SPECIFICATIONS

The simulator consists of:

- Desktop vertical panel that works together with a PC (not included)
- Color screen-printed plate reproducing the cross section of a gas turbine and the layout of the different components that forms the thermodynamic cycle

#### Hardware-set parameters

- Potentiometers to vary:
  - Air mass flow rate
  - Fuel mass flow rate
  - Services (active power and reactive power)



- Switches to set:
  - On/Off design
  - Regenerative Exchanger
- Signalling LEDs
- Touchscreen display for visualization of process parameters

#### Software-set parameters

- Age of plant
- Fuel type
- Compression ratio
- Exchange efficiency
- Monitoring of:
  - Numerical quantities
  - Trends with time
  - Phasor representation of required power
  - Warnings (turbine overload, alternator overload, too high temperature)

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

**Dimensions:** 650 x 400 x 120 (h) mm (panel)

**Net weight:** 6 kg

### REQUIRED

**PERSONAL COMPUTER**  
- NOT INCLUDED -



### SUPPLIED WITH

**THEORETICAL - EXPERIMENTAL HANDBOOK**

