

Steam Power Plant Turbine Apparatus (EDC-HT-034)

EXPERIMENTAL DATA:

- Steam plant performance and working, as well as the Rankine cycle analysis.
- Marcet boiler experiment on saturated steam (pressure temperature relationship).
- Pressure Measurements at different point in the Boiler Cycle.
- Temperature Measurement at different of Boiler Cycle.
- Flow measurements of Fuel, Condensate (Steam).
- Heat of Combustion in the Combustion Chamber (calculated).
- Heat given to steam by the fuel combustion.
- Boiler efficiency.
- Quality of steam using Calorimeters.



DESCRIPTION:

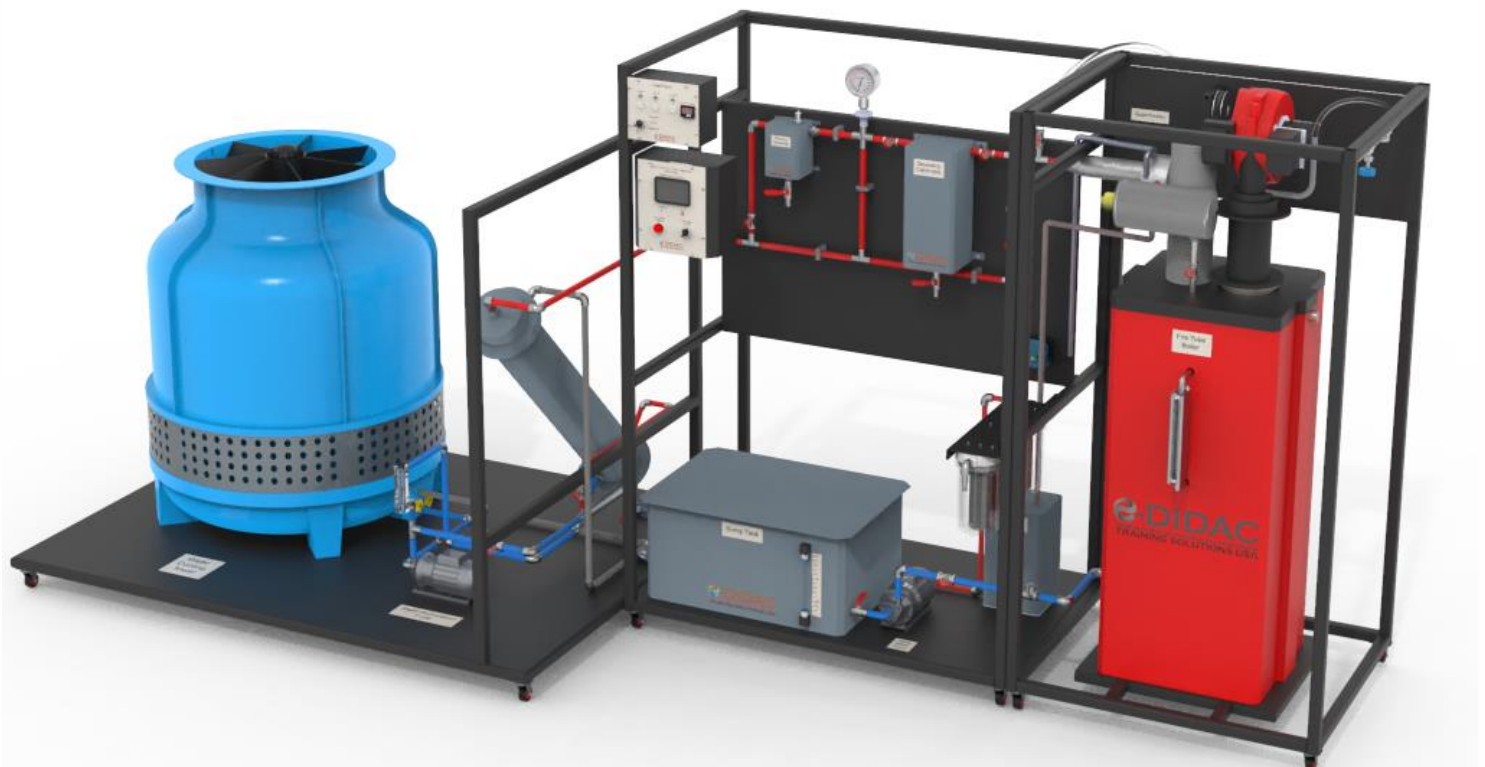
This system is Ideal for students to gain insight into the first of thermodynamics. It introduces students to industry-standard methods of analyzing steam plant performance, including Rankine Cycle Analysis.

This System Contains a Rankine cycle steam turbine, throttle valve, impulse turbine, sub-atmospheric water-cooled condenser and boiler feed pump. Instrumentation to record all relevant temperatures, pressures, cooling water and gas flows, turbine speed.

Safety to include high pressure cut out switches and relief valves on boiler and condenser, steam solenoid valve and electrical overload cut outs and earth leakage circuit breaker.

This system is Self-contained in a mobile frame that includes all instruments needed for experiments. This Allows students to copy the Marcet Boiler Experiment to prove the pressure-temperature relationship for saturated steam.

Optional Software is available for Data Acquisition and Control Function.



SPECIFICATIONS AND TECHNICAL DATA:

- **Steam Turbine/ Energy Converter:**
 - **Type:** Single stage, impulse turbine.
 - **Max. Output:** 50W.
 - **Maximum Speed:** Approx. 3500 RPM.
 - **Exhaust Pressure:** Atmospheric.
- **Boiler/ Steam Generator:**
 - Boiler with vertical, fire tube type.
 - Burner Type: On Off, Automatic.
 - Fuel: Petrol.
 - Feed Water System.
 - Temperature sensors with Digital Display.
- **Fuel System:**
 - Fuel Tank.
 - Fuel flow meter.
- **Condenser:**
 - Shell and Tube Accessories.
 - Separating and Throttling Calorimeter, Super Heater.
 - Water Cooling Tower (optional).
 - Water filter
- **Assembly:**
 - All of the components are mounted.
- **Throttling calorimeter:**
 - To check the quality of steam.
- **Instrumentation and measurement:**
 - Throttling calorimeter and thermocouple to measure the dryness fraction of the steam.
 - Thermocouples and temperature sensors display for steam and cooling water temperatures.
 - Digital Touch LCD display for Monitoring and control.
 - Calibrated vessel with stopwatch and thermometer for condensate (steam flow) measurement.

NOTE (Optional):

- The apparatus has optional:
 - Output: 100W, 200W, 500W, 1kW and 2kW.
 - Fuel Type: Diesel, Gasoline and Electrical Heater type.
 - Water cooling tower.
 - Water filter.
- Depending on the above options, the size and design of apparatus may change.

DIMENSIONS AND WEIGHT:

- L x W x H (mm): 4400 X 1600 X 2000 approx.
- Weight: 150 kg approx.

SCOPE OF DELIVERY:

- 1 x EDC-HT-034.
- 1 x Instructional Manual.
- 1 x Safety and Maintenance Manual.

