



Steam Turbine Plant (SMT-SPP-01)

This system is Ideal for students to gain insight into the first and second laws of thermodynamics. It introduces students to industry-standard methods of analyzing steam plant performance.

This System Contains A bench top steam turbine with electric fired boiler, throttle valve, impulse turbine, and boiler feed pump. Instrumentation to record all relevant temperatures, pressures, cooling water and gas flows, turbine speed and turbine brake load.

Safety to include high pressure cut out switches and relief valves on boiler, 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. The measurements are read off digital displays and can simultaneously be transmitted directly to a PC via USB and analyzed there using then ESOLS Real Time DAQ software.



TECHNICAL SPECIFICATIONS

Specifications:

- **Energy Converter:**
 - **Steam Turbine.**
 - **Type:** Single stage, steam turbine made from Stainless Steel/Super Alloy.
 - **Max. Output:** 2 KW
- **Working Fluid:**
 - Water/Steam
- **Steam Generator:**
 - Boiler (with Electric heater) with safety valves and water Level gauge and instrumentation (Temp/pressure).
 - Maximum experiment pressure approximately 350 kPa to 800 kPa (set by 1000 kPa by adjustable pressure relief safety valve).
- **Dynamometer:**
 - For measurement of brake power with digital torque and speed display.
- **Instrumentation:**
 - Digital display.
- **Assembly:**
 - All the components are bench mounted.
- **Water Tank:**
 - For storing and circulation of water
- **Instrumentation and measurement:**
 - Dynamometer and display unit for motor speed and power measurement.
 - Pressure gauges for boiler and engine (motor) inlet pressures, including electronic transducers for connection to LCD.
 - Thermocouples display for steam temperatures.
 - Power meter for heater power input, including an output.
- **Control Panel:**
 - Digital display screen (Temperature, Pressure, RPM, steam flow rate, electric power)
- **Screen Monitoring:**
 - LCD/LED Touchscreen (Temperature, Pressure, Turbine RPM, steam flow rate, electric power)
- **Safety Features:**
 - Emergency stop, overpressure relief valve, temperature cut-off
- **Temperature Range:**
 - 50°C to 200°C
- **Pressure Range:**
 - 1 bar to 6 bar
- **Electrical Input:**
 - 380V (3P), 50Hz