



DESCRIPTION

Steam turbine power plant trainer helps the students to understand the complete cycle of a thermal power plant. Many different experiments can be conducted on this equipment. Non-combustion heat sources such as solar power, nuclear power or geothermal energy may be used as alternative source of heat.

1. Heat energy converts water into steam
2. Steam pressure when moves turbine produces mechanical energy
3. Finally, mechanical energy is converted into electricity through alternator

RANGE OF EXPERIMENTS

- Boiler Performance
- Turbine & Generator Performance
- Condenser Performance
- Feed Water Pump Performance
- Cooling Tower Performance
- Power Plant Performance
- Steam Properties & Quality

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- Steam rates, Thermal efficiency, and plant efficiencies at various loads
- Determination of Brake power
- Demonstration of actual power generation

TECHNICAL SPECIFICATIONS

(A) Steam Turbine with Dynamometer

- Type: Single stage, impulse turbine
- Max. Output: 1000 Watt (1 Kwa)
- Alternator: 220V, 50Hz, 1Ph
- Nominal Power: 800 Watt
- Max. Speed: Approx. 1,800 to 3,000 rpm
- Exhaust Press.: Atmospheric
- Casing: Vertically Split
- Seals: 1 Carbon Ring on High Pressure side
- Bearing: Two for better load distribution
- Steam flow regulation by Globe Valve
- Steam at Inlet Point: 25~35 Kg/Hour / 10.5 Bar G / 190°C – 98% Dry
- Steam at Discharge End: 25~35 Kg/Hour / 1.0 Bar G / 120°C – Wet
- Thermal Efficiency of the Turbine: @47%
- Mechanical Efficiency of the Turbine: @33%
- Assumed mech. efficiency for the DC Generator: @84%
- Overall Efficiency of the Unit: @25%
- Inlet & Discharge Connections: 15 mm Globe valve & 75 mm Flange
- Speed sensor for turbine
- Temperature sensors for steam inlet and outlet
- The speed governor will be regulated by steam flow using appropriate valve
- Electrically operated superheater for steam is also provided



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(B) Boiler Steam Generator

- Boiler with vertical, fire tube type
- Burner Type: On/Off, automatic
- Fuel: Diesel Fired
- Feed Water System
- Rated heat output: @35 KW (53,900 kcal/h)
- Equivalent evaporation: @50 Kg/h steam
- Maximum working pressure: 10 kg/cm² (0.98 MPa)
- Measuring instruments: Pressure gauge for steam outlet
- Temperature sensors for feed water, boiler outlet, exhaust



(C) Fuel System

- Diesel Fuel Tank
- Fuel Level Indicator
- Fuel Air Lock release mechanism
- Fuel flow sensor
- Fuel Pressure Indicator



(D) Condenser

- Shell & Tube Type
- Separating Calorimeter
- Super Heater
- Cooling Tower

(E) Instrumentation and Measurements

- With throttling calorimeter to measure the dryness fraction of the steam
- With temperature sensors with display for steam and cooling water temperatures
- Parameters should be display in digital for monitoring and control

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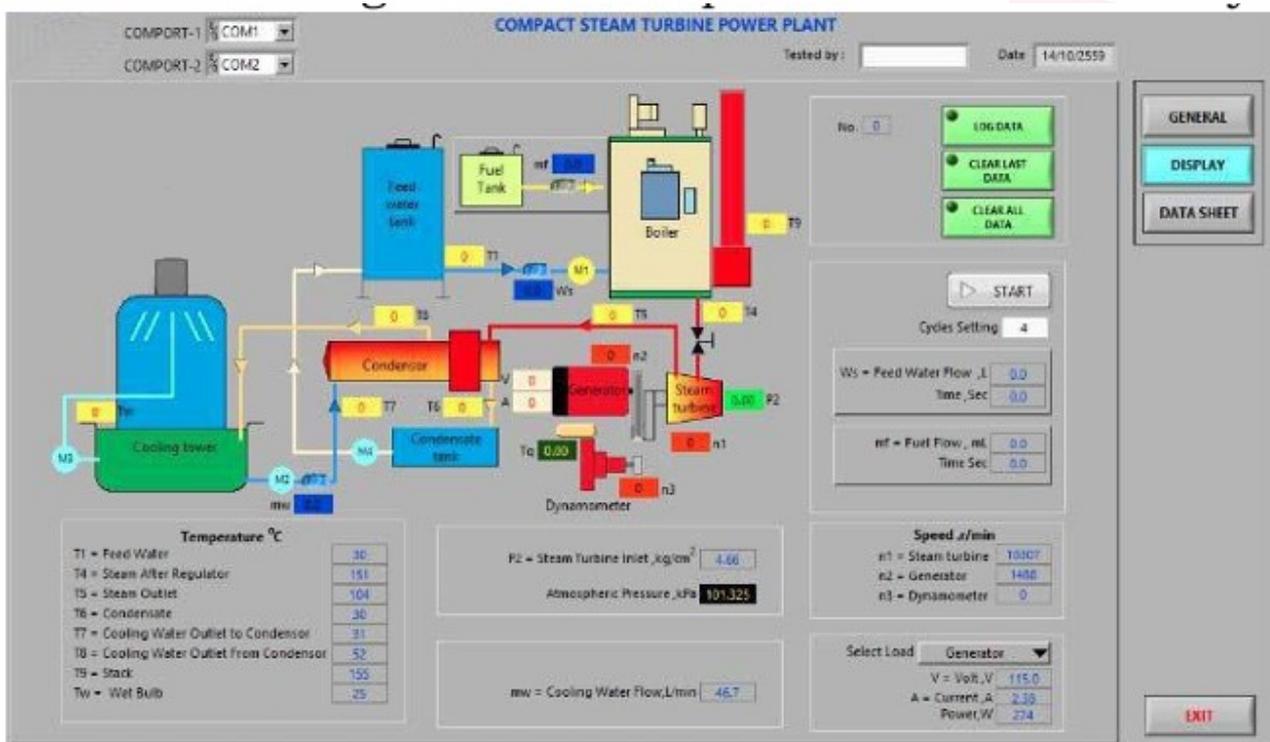
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(F) Data Acquisition System

- Data Acquisition system
- USB Interface to connect with computer
- Software, data logger & required digital sensors
- Desktop computer with LED display will be provided
- PLC Computer control & integration of HMI panel for PLC Control system is provided



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