



Description

Study of power generation using steam boiler and performance of steam generator is focus of this trainer. Tesca has designed this system in such fashion that enables students to investigate all the parameters governing the utilization & maintenance of a typical power plant. The system uses a small sized boiler unit that runs on LDO/gas. The generated steam is then used to run the steam turbine with in turn runs the A.C. Generator to produce the electricity or loading can be done by using Alternator & Bulb bank. A loading arrangement is also given for load test. The unit is fitted with a colored mimic diagram that illustrates the constructional and operational features. The various aspects of boiler and turbine operation and maintenance can be studied. Instrumentation is provided to measure Temperatures and Pressures. Temperature pressure characteristics of boiler can also be plotted.

Features

- Laboratory-sized specially designed Steam Power Plant
- Process control system based on PLC
- Plant monitored and controlled via optional touchscreen control station

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System Components

- Boiler 200 kg/Hr at 11bar
- Single-stage Steam turbine with Curtis wheel and hydraulic speed regulator: 1.5 KW @ 3000RPM
 Fuel consumption: 12L/h
 Heat-up time: 8min
 Max. pressure: 13bar
 Heater: power 7kW
- Condenser shell & tube type.
- Pressure measurements: 3 x 0 to 16 bar, 2 x 0 to 4 bar, 1 x -1 to 1 bar
- Chimney
- Orifice meter
- Control valve: Electric Solenoid type
- Pump Centrifugal pump: 2Hp capacity &

Note: Specifications are subject to change.

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- reciprocating pump.
- Flow meter: Flow rate 0 to 160L/min (cooling)
- Water Software
- Steam Calorimeter-separating & throttling calorimeter
- Temperature inductor: 12 channel input K type thermocouple
- Fuel supply system: volumetric type capacity 50Liter
- K type thermocouple temp. sensor
 Temperature measurements: 12 x 50° to 400°C; 1 x 0 to 100°C
- Torque measurement: 0 to 10Nm
- Digital tachometer 0-9999rpm
- Voltmeter 0-500V
- Ammeter 0-10Amp.
- Loading Arrangement-Electrical Alternator
- Lamp bank
- Control Panel
- Cooling tower (Optional)

Optional Accessories

- Data Acquisition system with scanner
- Super heater
- Blow down tank
- Computer

Range of Experiments

- Study of steam operated power plant.
- First and second law of thermodynamics analysis of complete steam plant.
- Determination of turbine power output with closed nozzles.
- Measurement of power by dynamometer
- Study of Efficiency of generator
- Study of specific consumption of steam against power generator.
- Study of thermodynamic efficiency.

Service Required at Site

- Electric supply 3 phase 440V AC with neutral & proper earthing
- Water supply for Boiler & drainage facility
 Cooling water 10m³/hr
- Sump water tank 1500ltr capacity approx.
 Compressed air connection: 4.5bar, 150ltr/hr
- Boiler feed water tank 1000ltr
- Piping for plant to site water tanks & drainage tank
- Diesel-40 liter
- Holes in wall for smoke suite & other drainage
- Foundation & Trench
- Room size: 8 x 5 x 7 mtr

Optional Accessories

- computerized Data Acquisition System