

**DESCRIPTION:**

Francis Turbine is a reaction turbine, which was developed by an English born American Engineer Sir J. B. Francis. The water enters the turbine through the outer periphery of the runner in the radial direction and leaves the runner in axial direction and hence it is called a mixed flow turbine. As the water flows to the runner, a part of pressure energy goes on changing into kinetic energy. Thus, the water through the runner is under pressure. The runner is completely enclosed in a air tight casing and the casing & runner is always full of water. The present set-up consists of a runner. The water is fed to the turbine by means of Centrifugal Pump, radially to the runner. The runner is directly mounted on one end of a central SS shaft and other end is connected to a brake arrangement. The circular window of the turbine casing is provided with a transparent acrylic sheet for observation of flow on to the runner. This runner assembly is supported by thick cast iron pedestal. Load is applied to the turbine with the help of brake arrangement so that the efficiency of the turbine can be calculated. A draught tube is fitted on the outlet of the turbine. The set-up is complete with guide mechanism. Pressure and Vacuum gauges are fitted at the inlet and outlet of the turbine to measure the total supply head on the turbine. Sensors are provided at adequate positions for data acquisition which can be analysed on PC through USB connection with the help of software. Load cell is provided for torque, pressure sensor for head and vacuum measurement , DPT for discharge measurement.

Technical Details:

- Output Power: 1 KW.
- Discharge: 1200 LPM (Approx.)
- Supply Head 20 m (Approx.)
- Speed: 3000 RPM (Approx.)
- Runner: Having Curved Vanes.
- Dynamometer: Rope Brake type, Dia 220 mm with spring balance
- Sump Tank: Capacity 300 Litres.
- Water Circulation: Centrifugal Pump, Kirloskar Make, Capacity 5 HP Three Phase. Suction 65 mm, delivery 80 mm.

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



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- Pressure gauge: 0 to 4 kg/cm²
- Pressure gauge: 0 to 6 bar
- Discharge Measurement: orifice meter 53 mm.
- Differential pressure transmitter: range: 0 to 200 mm WC
- Load cell: 50 kgs
- Control Panel Comprises of: L&T make fully automatic star/delta Starter, Mains Indicator, MCB for overload protection.
- Instruction Manual: An ENGLISH instruction manual will be provided along With the Apparatus
- Tanks will be made of Stainless Steel.
- The whole set-up is well designed and arranged in a good quality painted structure.

Experiment:

- To study the operation of a Francis Turbine.
- To determine the Output Power of Francis Turbine.
- To determine the Turbine Efficiency.

Utilities Required:

- Water Supply and Drain.
- Electricity 5 kW, 440V AC, Three Phases.
- Floor Area 2 x 1 m.

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