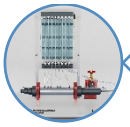


Demonstration of Francis Turbine Apparatus (SMT-FM-16)

The Francis turbine is a type of reaction turbine. Such type turbines convert the pressure energy of water into kinetic energy entirely in the distributor. The water is fed in the distributor by means of a spiral housing. The flowing water is accelerated in the distributor by the adjustable guide vanes and directed onto the blades. The redirection and further acceleration of the water in the rotor generates an impulse which is transmitted to the rotor.

This ESOLS product consists the rotor, the distributor with adjustable guide vanes, a band brake for loading the turbine and a housing with a transparent front panel. The transparent cover enables to observe the water flow, the rotor and the guide vanes during operation. The angle of attack and thus the power of the rotor are modified by adjusting the guide vanes.

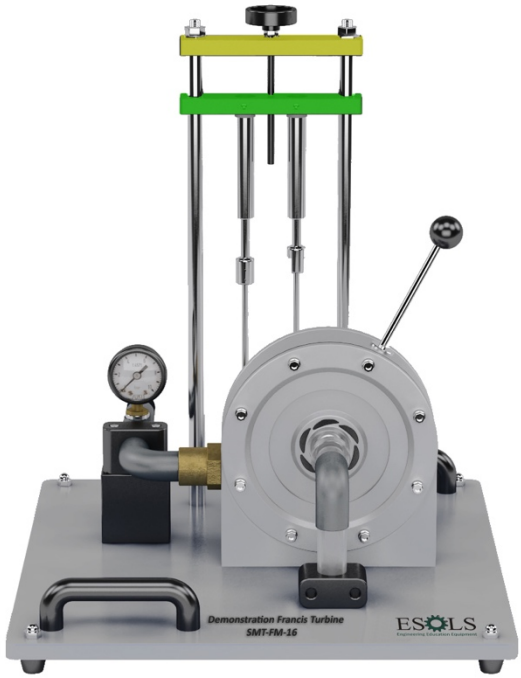
A simple mechanical brake and spring balance assembly attached to the shaft of the Francis Shaft applies a variable mechanical load (torque). Students use this with the speed (from the optional tachometer) to find power absorbed by the turbine. A gauge measures inlet pressure.

This unit can be operated by Laboratory supply of with any Hydraulic Bench.

TECHNICAL SPECIFICATIONS

Specifications:

- Study of functionality of Francis Turbine
- Transparent PMMA window so students can see the Francis Turbine working
- Includes band brake and spring balance to measure turbine torque
- Includes pressure gauge to measure inlet pressure
- Screw-controlled spear valve for precise inlet flow control
- Adjustable guide vanes for setting different angles of attack
- Water supply using SMT-FM-100 base module.
- Supplied with a comprehensive user guide.
- PVC Pipe Fittings.



Web: http://www.esolsengineering.com, Email: esolsengineering@gmail.com

Technical Data:

- Francis turbine:
  - output: 3.5 to 5W at 1000min-1,
  - approx. 35L/min, H=10m
- Rotor:
  - 7 blades
  - blade width: 5mm
  - external Ø: 50mm
- Guide Vanes:
  - 6 Vanes
  - Adjustable: 20 Stages
- Measuring ranges:
  - force: 2x 0 to 10N
  - pressure: 0 to 1bar
- LxWxH: 400x400x600mm.
- Weight: approx. 15kg.
- Accessories (Included)
- All necessary Flexible pipes and fittings.
- Instruction Manual
- Operating Conditions
- Laboratory Temperature: 5°C to 40°C
- Note:

This product may produce small splashes of water in use, so you must use it at a safe distance from electrical supplies. ESOLS recommends approximately 2.0 m.

Experimental Data:

- Performance of a Francis turbine at different flow rates
- Study of Torque, Power and Efficiency of a Francis turbine
- The effect of guide Vanes position
- The graphical representation of characteristic curves for torque, power and efficiency

Web: http://www.esolsengineering.com, Email: esolsengineering@gmail.com