



### Turbine Specifications

- **Impeller Diameter (d):** 100–130 mm
- **Number of Blades (no):** 16–20
- **Turbine Diameter:** 100 mm
- **Power Output:** 0.75–1 kW
- **Maximum Flow Rate:** 10 m<sup>3</sup>/h
- **Jet Diameter:** 10 mm
- **Maximum Head:** 50–80 m
- **Efficiency:** 90% or above
- **Axis Orientation:** Horizontal / Vertical
- **Number of Nozzles:** 2
- **Nominal Speed:** 1,900 r.p.m.

### Structural and Operational Features

- **Transparent Front:** Displays the impeller in operation for educational and monitoring visibility.
- **Water Simulation System:**
  - **Water Tank:** Simulates the reservoir

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



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- **Water Pump:** Simulates a waterfall of up to 80 meters
- **Piping:** 2-inch PVC pipes for water delivery from pump to injectors
- **Control Mechanisms:**
  - **Servo-Driven Injectors:** Two servomotors control injector opening and closing
  - **Sensors:** Measure flow, pressure, speed, and torque for detailed performance analysis

### Performance Analysis

- **Visualization and Measurement:**
  - Torque vs. injector opening
  - Mechanical power
  - Water flow required for power generation
- **Optimization:**
  - Optimizes turbine performance under varying head conditions
  - Analyzes the effect of injector pressure asymmetry on overall performance

### Electrical Components

- **Power Generation:** Operates in both DC and AC modes
- **Load Types:** Includes resistive and capacitive loads
- **Control and Regulation Unit:**
  - Analog instruments: voltmeters, wattmeters, varimeters
- **Battery:** 12V 12Ah battery for energy storage
- **Inverter:** Sinusoidal inverter (DC to AC) with 200 VA power output
- **Advanced Controller:**
  - Automatically adjusts injector position based on generated power
  - Protective features: over-frequency, over-voltage, over-current, reverse power
- **Network Analyzer:** Measures and visualizes electrical parameters injected into the grid

### SCADA System

- **Data Collection:** Collects all electrical and mechanical parameters
- **Application:** Analyzes turbine and hydroelectric power plant operation

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