

H19

Pelton Turbine

A compact unit for demonstrations and performance tests on a Pelton turbine



- Works with TecEquipment's Gravimetric or Volumetric Hydraulic Benches for easy installation
- Transparent window so students can see the Pelton wheel working
- Includes dynamometer to load the turbine and help find the power absorbed (needs an optional tachometer to find speed)
- Low bearing resistance for accurate results
- Includes inlet pressure gauge
- Screw-controlled spear valve for precise inlet flow control
- Range of performance tests

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Pelton Turbine

Description

Shows students how an impulse (Pelton) turbine works and tests its performance. The Pelton wheel is an important and efficient fluid power machine, used in many applications.

The unit consists of a Pelton wheel mounted in a corrosion-resistant enclosure. A transparent front panel allows students to see the turbine working. An optional Stroboscope (ST1, available separately) can 'freeze' the image of the turbine to help students better understand how it works.

An adjustable spear valve directs a jet of water through a nozzle to the buckets of the Pelton wheel to make it turn. Manual adjustment of the spear valve controls the water jet from the nozzle.

The turbine includes all pipes and fittings to connect it to TecEquipment's Gravimetric or Volumetric Hydraulic Bench (H1 or H1D, available separately). The hydraulic bench also measures flow rate.

The Optical Tachometer (OT1, available separately) can measure the speed of rotation of the turbine.

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

Students adjust the spear valve and measure inlet pressure, flow rate and torque (and speed with the optional tachometer). They plot these values to find the turbine performance.

Standard Features

- Supplied with a comprehensive user guide
- Two-year warranty
- Manufactured in accordance with the latest European Union directive

Essential Ancillaries

- Hydraulic Bench: Gravimetric (H1) or Volumetric (H1D)
- Optical Tachometer (OT1)

Recommended Ancillaries

- Stroboscope (ST1)

Experiments

Observation and determination of the performance characteristics of a small Pelton turbine, including:

- Production and analysis of graphs of inlet pressure, flow rate, torque and power against speed for a selection of nozzle positions.
- Determination of overall efficiency of conversion of fluid to mechanical energy, over a range of conditions.

Essential Services

Water supply:

From the Hydraulic Bench (H1 or H1d)

Operating Conditions

Operating environment:

Laboratory environment

Storage temperature range:

-25°C to +55°C (when packed for transport)

Operating temperature range:

+5°C to +40°C

Operating relative humidity range:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

Specification

Nett dimensions:

470 mm x 300 mm x 330 mm and 5.5 kg

Packed dimensions and weight:

0.07 m³ and 10 kg (approximate weight)

Maximum speed:

Approximately 1000 rev.min⁻¹

Maximum brake power:

Typically 3.5 W at 500 rev.min⁻¹