



H19

PELTON TURBINE

A compact experiment for use with the Hydraulic Bench to demonstrate how a Pelton turbine works and to test its performance.



SHOWN MOUNTED ON TECQUIPMENT'S DIGITAL HYDRAULIC BENCH (HIF) - AVAILABLE SEPARATELY

KEY FEATURES

- Works with TecEquipment's Digital Hydraulic Bench for easy installation
- Includes dynamometer to load the turbine and help find the power absorbed (needs an optional tachometer to find speed)
- Transparent window so students can see the Pelton wheel working
- Includes band brake to measure turbine torque
- Includes inlet pressure gauge
- Screw-controlled spear valve for precise inlet flow control

LEARNING OUTCOMES

- Performance charts of power, speed, torque and efficiency
- The effect of spear valve position

KEY SPECIFICATIONS

- 3.5 watt nominal power
- Band brake
- Adjustable spear valve
- Inlet pressure gauge



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 product 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 TecQuipment's Digital Hydraulic Bench (H1F, available separately)*, for flow measurement.

The Optical Tachometer (OT1, available separately) measures 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. A 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
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer

ESSENTIAL BASE UNIT

- Digital Hydraulic Bench (H1F)*

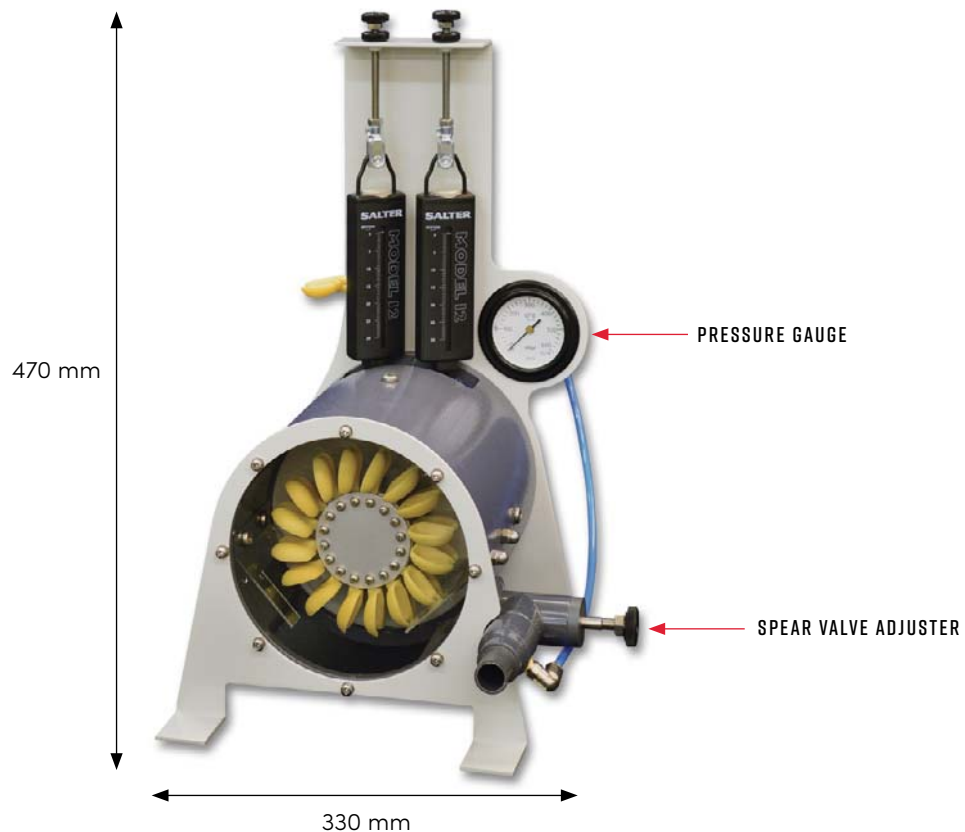
*This product will also work with an existing TecQuipment Volumetric Hydraulic Bench (H1D)

ESSENTIAL ANCILLARY

- Optical Tachometer (OT1)

RECOMMENDED ANCILLARY

- Stroboscope (ST1)

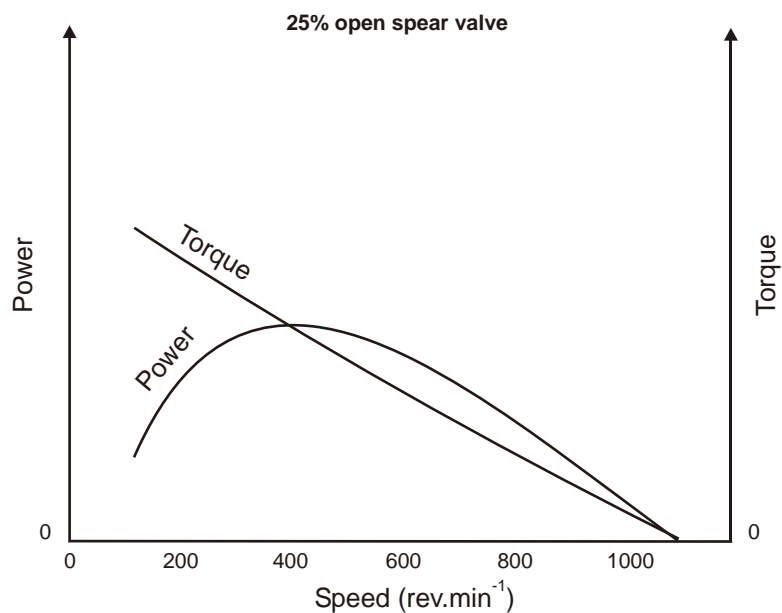
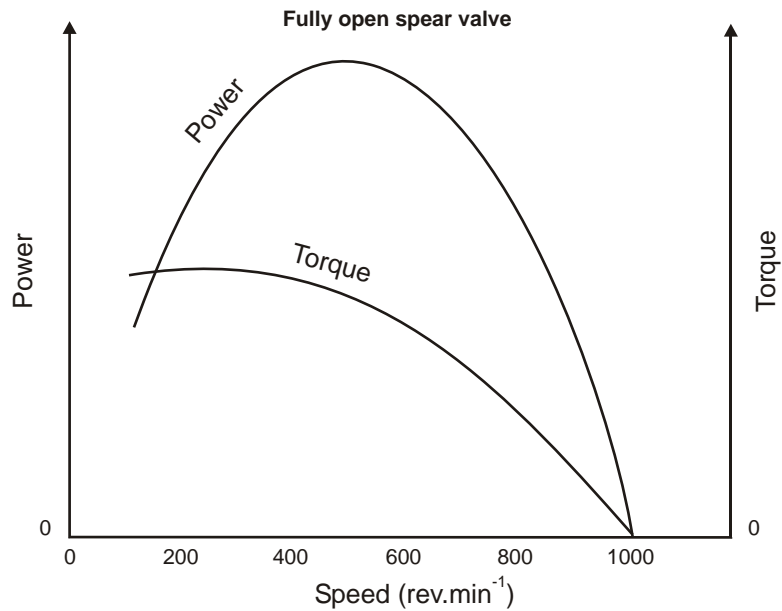


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TYPICAL WORK ASSIGNMENT

PERFORMANCE TEST

This experiment asks students to test the turbine with the spear valve at different settings, from fully open to 25% open. The results produce charts of efficiency, power and torque against turbine speed.



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DETAILED SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

NETT DIMENSIONS AND WEIGHT:

470 mm x 300 mm x 330 mm and 5.5 kg

APPROXIMATE 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

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

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

SOUND LEVELS

Less than 70 dB(A)