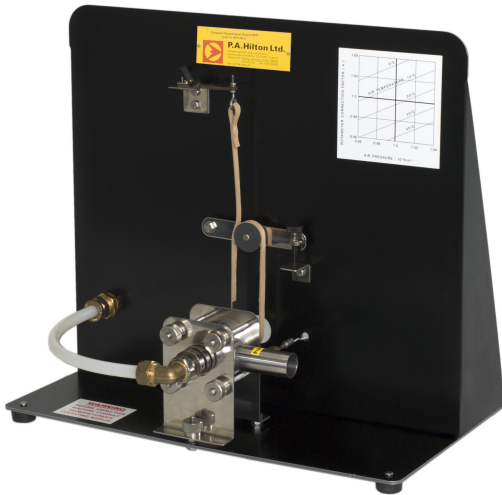


EXPERIMENTAL REACTION TURBINE F300D



Year 1
study

Description

The Reaction Turbine Module F300D turbine is a single stage, radial flow, two jet reaction machine, operating on air, specially designed and manufactured by P.A. Hilton Limited for experimental and teaching purposes. With a throttle valve and belt brake dynamometer, inlet and outlet air temperatures are recorded allowing the temperature drop due to work output to be measured. The turbine rotor is carried on a steel shaft running in oil lubricated ball bearings. Compressed air, delivered to the rotor through a central duct provided with a face seal, passes into the rotor and then moves radially to convergent nozzles formed in the periphery. The resulting high velocity jet leaving the rotor and the momentum changes associated with the air movement produces a REACTION which drives the rotor and produces a shaft power output. The turbine rotor is housed within a thick walled stainless steel exhaust casing and air from this passes to the atmosphere via a flow meter. Inlet and outlet air pressures, temperatures and air flow rate, turbine torque and speed are recorded by a combination of instrumentation on the Compressible Flow Range F300 base unit and the optional module.

Related Laws/Applications

- First Law of Thermodynamics
- Impulse Turbine
- Single Stage
- Radial Flow
- Isentropic Efficiency

Learning capabilities

- Investigation of torque/speed and power/speed characteristics of a single stage reaction turbine.
- Application of the First Law of Thermodynamics to a simple open system undergoing a steady flow process.
- Determination of the isentropic efficiency of a turbine.
- Construction of retardation curve and from this the estimation of the effect of resistances due to mechanical and fluid friction.

Technical Specification

- 2 x Thermocouples
- 10N Load Cell maximum capacity
- Turbine Speed: 35,000 rpm (continuous)
- Turbine Speed: 40,000 rpm (short periods only)
- Pressure Relief valve setting: 100kN/m2.

Essential Ancillaries

- F300

What's in the Box?

- 1 x F300D
- 1 x Syringe
- 1 x Lubricating Oil
- 2 x Brake Band
- 1 x Turbine Shaft Bearing
- Instruction manual
- Packing List
- Test Sheet

Essential Services

- Air requirement: approximately 400 litres free air per minute at a pressure of 300 to 1000 kN m-2 gauge supplied to the F300 base unit.

Ordering information

To order this product, please call PA Hilton quoting the following code:
F300D

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COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 5 YEARS