Features:

- The characteristic behavior of an impulse turbine with airflow
- Optimal view of the operating area of a turbine
- A load applied by band brake

Tesca Air Operated Impulse Turbine, the working medium has the same static pressure in front of and behind the rotor. The conversion of pressure energy into kinetic energy takes place in the fixed nozzles of the distributor, not at the turbine rotor. This compressed-air driven experimental unit can be used to understand turbines powered by steam or water.

The 32105 is a single-stage, axial impulse turbine. The turbine consists of a rotor that is installed inside a transparent housing, a distributor with four nozzles, and a band brake for applying a load to the turbine. The number of active nozzles can be adjusted by means of the valves. The compressed air velocity is increased in the nozzles. The airflow that hits the blades generates an impulse that causes the rotor to start moving.

The inlet and outlet pressure at the turbine is indicated on manometers. The turbine torque is determined by measuring the force on the band brake. The speed is measured with an optical speed sensor. Torque, speed, and temperatures are digitally displayed. The airflow rate is measured with a rotameter and set by means of a valve.

The turbine is fitted with a solenoid valve as a safety device in case of over-speed. The brake drum on the turbine shaft is cooled by the compressed air.

Specifications:

- Investigation of a compressed air-driven axial impulse turbine
- Transparent front panel for observing the operating area
- Distributor with 4 nozzles
- Selectable number of nozzles
- Applying a load to the turbine by using the band brake
- Setting the primary pressure with the pressure reducing valve
- Valve and flow meter for setting the flow rate
- The solenoid valve is a safety device to prevent over-speed
- Determination of the torque on the turbine shaft using a force sensor
- Measurement of the turbine speed with an optical speed sensor
- Manometer for displaying pressures on the inlet and outlet side

Note: Specifications are subject to change.

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- Digital display of speed, torque, and temperature

Technical Specifications:

Axial impulse turbine

- Max. power: 50W at 15000min-1

Rotor

- Diameter: 55mm
- Number of blades: 28

Stator

- 4 nozzles, number can be selected
- Entry and exit angle: 20°

Measuring ranges

- Temperature: -20...1100°C
- Speed: 0...40000min-1
- Torque: 0...10Ncm
- Flow rate: 25...315L/min
- Inlet pressure: 0...2,5bar
- Outlet pressure: 0...0,1bar
- Primary pressure: 0...10bar

Experiments:

- Design and function of an impulse turbine
- Determination of torque, power and efficiency
- Graphical representation of characteristic curves for torque, power and efficiency
- Investigation of the effect of nozzle pressure and number of nozzles

Requirements:

- Water connection 300L/h, drain

Note: Specifications are subject to change.

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