

NOZZLE PRESSURE DISTRIBUTION MODULE F300B



Year 1
study

Features

- Three Nozzles
- 2 x Convergent-Divergent
- 1 x Convergent

Description

Two convergent-divergent nozzles of with the same throat diameter but different discharge area and a single convergent nozzle having the same diameter are supplied and fit in the common test section. All three nozzles have axial static pressure tapings allowing the approach, throat and divergent section pressures to be measured. The variation of pressure ratio and mass flow may be investigated for all three nozzles. Standard unit includes convergent – divergent ducts designed to produce Mach 1.0 at the throat and supersonic velocities downstream. Instrumentation on the Compressible Flow range F300 base unit and the optional module allow all relevant temperatures, pressures and flow rates to be recorded.

Related Laws/Applications

- Compressible Flow
- Nozzles
- Flow Theory
- Bernoulli's Equation
- Shock Waves
- Supersonic Flow
- Fluid Acceleration
- Turbines
- Jet Propulsion
- Rockets
- Ejectors

Learning capabilities

- Visual demonstration of the phenomenon of choking.
- Visual demonstration of the pressure distribution in nozzles which are over and under expanding.
- Demonstration of the effect of back pressure on the position of the shock and recompression in convergent-divergent nozzles.
- Determination of the effect of inlet pressure on mass flow rate, with constant back pressure, and comparison with the theoretical value for a gas flowing isentropically.
- Determination of the effect of back pressure on the mass flow rate, with constant inlet pressure and comparison with theoretical predictions.
- Observation of the pressure distribution in convergent and convergent-divergent nozzles at a variety of pressure ratios.
- Construction of "pressure profile" graphs.
- Comparison of "pressure profile" with that in an "isentropic nozzle" of the same dimensions.

Technical Specification

- 1 x Back Pressure Gauge: 0...1100kN/m²
- 8 x Nozzle Pressure Gauge
- 2 x Thermocouples

Essential Ancillaries

- F300

What's in the Box?

- 1 x F300B
- 1 x Nozzle 'B'
- 1 x Nozzle 'C'
- 1 x Exhaust Coupling
- 1 x Air Inlet Hose
- 2 year spares
- Instruction manual
- Packing List
- Test Sheet

Essential Services

- Air requirement: approximately 420 litres free air per minute at a pressure of 700 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: F300B

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COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 5 YEARS